

Chemung County

Hazard Mitigation Action Plan 2019



Mitigating Risk for a Safe, Secure, and Sustainable Future

DRAFT: April 2019



EXECUTIVE SUMMARY

The purpose of the Plan is to protect people and structures and to minimize the costs of disaster response and recovery. Chemung County updated their Hazard Mitigation Plan (“Plan” or “HMAP”) to address natural hazards that affect their area. The participating jurisdictions are: Chemung County, City of Elmira, Town of Ashland, Town of Baldwin, Town of Big Flats, Town of Catlin, Town of Chemung, Town of Elmira, Town of Erin, Town of Horseheads, Town of Southport, Town of Van Etten, Town of Veteran, Village of Elmira Heights, Village of Horseheads, Village of Millport and Village of Wellsburg.

The Hazard Mitigation Plan complies with all applicable provisions of the Disaster Mitigation Act of 2000 (DMA 2000) and FEMA’s criteria for approval of mitigation plans required in the Hazard Mitigation Assistance Unified Guidance (July, 2013.) With Chemung County having a FEMA-approved hazard mitigation plan, the jurisdictions will be eligible for grant funds through FEMA’s Hazard Mitigation Assistance (HMA) programs, which include: Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA) programs. Funds from these federal grant programs may be awarded directly to Chemung County and planning participants to implement mitigation projects identified in the Plan.

Representatives from each of the participating jurisdictions provided valuable input into the planning process. After the Planning Team was organized, a capability assessment was developed and distributed at the Kick-Off Workshop. Hazards were identified and assessed, and results associated with each of the hazards were provided at the Risk Assessment Workshop. Based on Chemung County’s identified vulnerabilities, specific mitigation strategies were discussed and developed at the Mitigation Strategy Workshop. Finally, Plan maintenance and implementation procedures were developed.

MISSION STATEMENT AND GOALS

The Federal Emergency Management Agency (FEMA) defines *Mitigation* as *sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects*. Therefore, the goal of the Plan is to minimize or eliminate the long-term risk to human life and property from known hazards through effective mitigation.

The Mission Statement of the Plan is, “*Maintaining a secure and sustainable future through the revision and development of targeted hazard mitigation actions to protect life and property.*”

Goal 1: Protect Public Health and Safety

Goal 2: Build and Support Local Capacity and Commitment to Continuously Become Less Vulnerable to Hazards

Goal 3: Increase Public Understanding, Support, and Demand for Hazard Mitigation

Goal 4: Protect New and Existing Properties

Goal 5: Maximize the Resources for Investment in Hazard Mitigation

Goal 6: Promote Growth in a Sustainable Manner

For more information, visit our website at:

www.chemungcountyny.gov

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BACKGROUND

Chemung County is in the southern tier of New York State. The area is referred to as Mark Twain Country. Chemung County was extracted from 520 square miles of Tioga County in 1836. In 1854, 110 miles of Tioga County were separated to form Schuyler County reducing Tioga County to its current size of 410 square miles.

Chemung County is surrounded by Schuyler County to the north, Tompkins County to the northeast, Tioga County to the east, Bradford County, Pennsylvania to the south, Tioga County, Pennsylvania to the Southwest, and Steuben County to the west. The City of Elmira is the county seat. The Southern Tier Express Way traverses through the county east-west ward near the Pennsylvania border.

Chemung County is prone to large amounts of snow that can result in flood events. While flooding is a well-known risk, Chemung County is susceptible to a wide range of natural hazards, including but not limited to thunderstorms, flooding, extreme cold, hail, ice storms, dense fog, heat, winter storms, drought, heavy snow, strong wind, and wild fires. These life-threatening hazards can destroy property, disrupt the economy, and lower the overall quality of life for individuals.¹

While it is impossible to prevent an event from occurring, the effect from many hazards to people and property can be lessened. This concept is known as hazard mitigation, which is defined by the Federal Emergency Management Agency (FEMA) as *sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects.*² Communities participate in hazard mitigation by developing hazard mitigation plans. The New York State Division of Homeland Security and Emergency Services (NYS DHSES) and FEMA have the authority to review and approve hazard mitigation plans through the Disaster Mitigation Act of 2000.

Hazard mitigation activities are an investment in a community's safety and sustainability. It is widely accepted that the most effective hazard mitigation measures are implemented at the local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive update to a hazard mitigation plan addresses hazard vulnerabilities that exist today and in the foreseeable future. Therefore, it is essential that a plan identify projected patterns of how future development will increase or decrease a community's overall hazard vulnerability.

¹ Source: <http://www.usa.com/chemung-county-ny-weather.htm>

² Source: <http://www.fema.gov/hazard-mitigation-planning-resources>

SCOPE AND PARTICIPATION

Chemung County's Plan is a multi-jurisdictional plan. The participating jurisdictions include Chemung County, City of Elmira, Town of Ashland, Town of Baldwin, Town of Big Flats, Town of Catlin, Town of Chemung, Town of Elmira, Town of Erin, Town of Horseheads, Town of Southport, Town of Van Etten, Town of Veteran, Village of Elmira Heights, Village of Horseheads, Village of Millport, and Village of Wellsburg. Representatives from these jurisdictions provided valuable input into the planning process. Throughout the plan "Chemung County planning area" refers to the entire planning area which includes all participating jurisdictions.

The focus of the Plan is to identify activities to mitigate hazards classified as "high" or "moderate" risk, as determined through a detailed hazard risk assessment conducted for Chemung County and the participating jurisdictions. The hazard classification enables the County and participating jurisdictions to prioritize mitigation actions based on hazards which can present the greatest risk to lives and property in the geographic scope (i.e., planning area).

PURPOSE

The Plan was prepared by Chemung County, participating jurisdictions, and H₂O Partners, Inc. The purpose of the Plan is to protect people and structures and to minimize the costs of disaster response and recovery. The goal of the Plan is to minimize or eliminate long-term risks to human life and property from known hazards by identifying and implementing cost-effective hazard mitigation actions. The planning process is an opportunity for Chemung County, the participating jurisdictions, stakeholders, and the general public to evaluate and develop successful hazard mitigation actions to reduce future risk of loss of life and damage to property resulting from a disaster in the Chemung County planning area.

The Mission Statement of the Plan is, *"Maintaining a secure and sustainable future through the revision and development of targeted hazard mitigation actions to protect life and property."*

Chemung County, participating jurisdictions, and planning participants identified five natural hazards to be addressed by the Plan. The specific goals of the Plan are to:

- Minimize disruption to Chemung County and the participating jurisdictions following a disaster;
- Streamline disaster recovery by articulating actions to be taken before a disaster strikes to reduce or eliminate future damage;
- Demonstrate a firm local commitment to hazard mitigation principles;
- Serve as a basis for future funding that may become available through grant and technical assistance programs offered by the State or Federal government. The Plan will enable Chemung County and participating jurisdictions to take advantage of rapidly developing mitigation grant opportunities as they arise; and
- Ensure that Chemung County and participating jurisdictions maintain eligibility for the full range of future Federal disaster relief.

AUTHORITY



The Plan is tailored specifically for Chemung County, participating jurisdictions, and plan participants including Planning Team members, stakeholders, and the general public who participated in the Plan development process. The Plan complies with all requirements promulgated by the New York State Division of Homeland Security and Emergency Services (NYS DHSES)

SECTION 1: INTRODUCTION

and all applicable provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390), and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108-264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). Additionally, the Plan complies with the Interim Final Rules for the Hazard Mitigation Planning and Hazard Mitigation Grant Program (44 CFR, Part 201), which specify the criteria for approval of mitigation plans required in Section 322 of the DMA 2000 and standards found in FEMA's "Local Mitigation Plan Review Guide" (October 2011), and the "Local Mitigation Planning Handbook" (March 2013). The Plan is also developed in accordance with FEMA's Community Rating System (CRS) Floodplain Management Plan standards and policies.

SUMMARY OF SECTIONS

Sections 1 and 2 of the Plan outline the Plan's purpose and development, including how Planning Team members, stakeholders, and members of the general public were involved in the planning process. Section 3 profiles the planning area's population and economy.

Sections 4 through 9 present a hazard overview and information on individual natural hazards in the planning area. The hazards generally appear in order of priority based on potential losses to life and property, and other community concerns. For each hazard, the Plan presents a description of the hazard, a list of historical hazard events, and the results of the vulnerability and risk assessment process.

Section 10 presents hazard mitigation goals and objectives. Previous mitigation actions for Chemung County and the participating jurisdictions are presented in Section 11, while Section 12 identifies new mitigation actions. Section 13 presents Plan maintenance mechanisms. Annex A through N provide a unique, stand-alone guide to mitigation planning for each participating jurisdiction.

The list of planning team members and stakeholders is located in Appendix A. Public survey results are analyzed and presented in Appendix B. Appendix C contains a detailed list of critical facilities for the area. Appendix D contains information regarding workshops and meeting documentation. The Capability Assessment results for Chemung County and participating jurisdictions are located in Appendix E, and Temporary Housing Plans for each participating jurisdiction are located in Appendix F.³

³ Information contained in some of these appendices are exempt from public release under the Freedom of Information Act (FOIA).

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PLAN PREPARATION AND DEVELOPMENT

Hazard mitigation planning involves coordination with various constituents and stakeholders to develop a more disaster-resistant community. Section 2 provides an overview of the planning process including the identification of key steps and a detailed description of how stakeholders and the public were involved.

OVERVIEW OF THE PLAN

Chemung County hired H₂O Partners, Inc. (Consultant Team), to provide technical support and oversee the development of the Plan. The Consultant Team used the FEMA “Local Mitigation Plan Review Guide” (October 1, 2011), and the “New York State Hazard Mitigation Planning Standards Guide” (2017) to develop the Plan. The overall planning process is shown in Figure 2-1 below.

Figure 2-1. Mitigation Planning Process



Chemung County, participating jurisdictions, and the Consultant Team met in April 2018 to begin organizing resources, identifying Planning Team members, and shaping a Capability Assessment.

PLANNING TEAM

Key members of H₂O Partners, Inc. developed the Plan in conjunction with the Planning Team. The Planning Team was established using a direct representation model. Some of the responsibilities of the Planning Team included: completing Capability Assessment surveys, providing input regarding the identification of hazards, identifying mitigation goals, and developing mitigation strategies. A Planning Team consisting of key personnel from each of the participating jurisdictions as well as Chemung County, shown in Table 2-1, was formed to coordinate planning efforts, request input, and participate throughout the planning process.

Table 2-1. Planning Team

DEPARTMENT	TITLE
Chemung County	Director of Fire and Emergency Management
Chemung County	Deputy Director of Fire and Emergency Management
Chemung County	Administrative Assistant of Fire and Emergency Management
Chemung County	Public Work Commissioner
Town of Ashland	Supervisor
Town of Ashland	Highway Superintendent
Town of Ashland	Code Enforcement Officer

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DEPARTMENT	TITLE
Town of Baldwin	Supervisor
Town of Baldwin	Highway Superintendent
Town of Baldwin	Code Enforcement Officer
Town of Big Flats	Supervisor
Town of Big Flats	Highway Superintendent
Town of Big Flats	Code Enforcement Officer
Town of Catlin	Supervisor
Town of Catlin	Highway Superintendent
Town of Catlin	Code Enforcement Officer
Town of Chemung	Supervisor
Town of Chemung	Highway Superintendent
Town of Chemung	Code Enforcement Officer
City of Elmira	Mayor
City of Elmira	City Manager
City of Elmira	Public Works Director
City of Elmira	Public Works Supervisor
City of Elmira	Code Enforcement Director
Town of Elmira	Supervisor
Town of Elmira	Highway Superintendent
Town of Elmira	Code Enforcement Officer
Village of Elmira Heights	Mayor
Village of Elmira Heights	Director of Public Works
Village of Elmira Heights	Code Enforcement Officer
Town of Erin	Supervisor
Town of Erin	Highway Superintendent
Town of Erin	Deputy Highway Superintendent
Town of Erin	Code Enforcement Officer

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DEPARTMENT	TITLE
Town of Horseheads	Supervisor
Town of Horseheads	Deputy Supervisor
Town of Horseheads	Highway Superintendent
Town of Horseheads	Deputy Highway Superintendent
Town of Horseheads	Code Enforcement Director
Village of Horseheads	Mayor
Village of Horseheads	Village Manager
Village of Horseheads	Director of Public Works
Village of Horseheads	Code Enforcement Officer
Village of Horseheads	Village Board Trustee
Village of Horseheads	Village Board Trustee
Village of Millport	Mayor
Village of Millport	Code Enforcement Officer
Village of Millport	Village Clerk
Town of Southport	Supervisor
Town of Southport	Deputy Supervisor
Town of Southport	Highway Superintendent
Town of Southport	Code Enforcement Officer
Town of Van Etten	Supervisor
Town of Van Etten	Deputy Supervisor
Town of Van Etten	Highway Superintendent
Town of Van Etten	Code Enforcement Officer
Town of Van Etten	Town Clerk
Town of Veteran	Supervisor
Town of Veteran	Highway Superintendent
Town of Veteran	Code Enforcement Officer
Village of Wellsburg	Mayor

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DEPARTMENT	TITLE
Village of Wellsburg	Village Clerk
Village of Wellsburg	Code Enforcement Officer

Additionally, a Stakeholder Group was invited to participate in the planning process via e-mail. The Consultant Team, Planning Team, and Stakeholder Group coordinated to identify mitigation goals and develop mitigation strategies and actions for the Plan. Appendix A provides a complete listing of all participating Planning Team members and stakeholders by organization and title.

Based on results of completed Capability Assessment, Chemung County and participating jurisdictions described methods for achieving future hazard mitigation measures by expanding existing capabilities. For example, several of the jurisdictions have a designated emergency manager but many do not have an emergency operations plan in place. Other options for improving capabilities include the following:

- Establishing Planning Team members with the authority to monitor the Plan and identify grant funding opportunities for expanding staff.
- Identifying opportunities for cross-training or increasing the technical expertise of staff by attending free training available through FEMA and the New York State Department of Homeland Security and Emergency Services Office of Emergency Management Training Programs by monitoring classes and availability through <http://www.dhses.ny.gov/oem/training/>.
- Reviewing current floodplain ordinances for opportunities to increase resiliency (above current standards) such as modifying permitting or building codes.
- Developing ordinances that will require all new developments to conform to the higher mitigation standards, exceeding current requirements.

Sample hazard mitigation actions developed with similar hazard risk were shared at the meetings. These important discussions resulted in development of multiple mitigation actions that are included in the Plan to further mitigate risk from natural hazards in the future.

The Planning Team developed hazard mitigation actions for mitigating risk from all of the hazards, including potential flooding, tornado, winter storm, thunderstorm and landslide. The actions include but are not limited to drainage improvement projects, improved storm water collection and conveyance systems, and implementing public information programs that will include evacuation routes and procedures, flood management techniques, and residential mitigation measures to reduce risk to life and property.

PLANNING PROCESS

The process used to prepare the Plan followed the four major steps included at Figure 2-1. After the Planning Team was organized, a capability assessment was developed and distributed at the Kick-Off Workshop. Hazards were identified and assessed, and results associated with each of the hazards were provided at the Risk Assessment Workshop. Based on Chemung County's identified vulnerabilities, specific mitigation strategies were discussed and developed at the Mitigation Strategy Workshop. Finally, Plan maintenance and implementation procedures were developed and are included in Section 13. Participation of Planning Team members, stakeholders, and the public at each of the workshops is documented in Appendix D.

At the Plan development workshops held throughout the planning process described herein, the following factors were taken into consideration:

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- The nature and magnitude of risks currently affecting the community;
- Hazard mitigation goals to address current and expected conditions;
- Whether current resources will be sufficient for implementing the Plan;
- Implementation problems, such as technical, political, legal, and coordination issues that may hinder development;
- Anticipated outcomes; and
- How Chemung County, participating jurisdictions, agencies, and partners will participate in implementing the Plan.

KICKOFF WORKSHOP

The Kickoff Workshop was held at the Big Flats Community Center on April 12, 2018. The initial workshop informed County officials and key department personnel about how the planning process pertained to their distinct roles and responsibilities and engaged stakeholder groups, including but not limited to the County Soil and Conservation District, Stormwater Coalition, local Medical Centers, Chemung County Chamber of Commerce, and local university and college. In addition to the kickoff presentation, participants received the following information:

- Project overview regarding the planning process;
- Public survey access information;
- Hazard Ranking form; and
- Capability Assessment survey for completion.

A risk ranking exercise was conducted at the Kickoff Workshop to get input from the Planning Team and stakeholders pertaining to various risks from a list of natural hazards affecting the planning area. Participants ranked hazards high to low in terms of perceived level of risk, frequency of occurrence, and potential impact.

HAZARD IDENTIFICATION

At the Kickoff Workshop and through e-mail and phone correspondence, the Planning Team conducted preliminary hazard identification. The Planning Team in coordination with the Consultant Team reviewed and considered a full range of natural hazards. Once identified, the teams narrowed the list to significant hazards by reviewing hazards affecting the area as a whole, the 2012 Chemung County All-Hazard Mitigation Plan Update, and initial study results from reputable sources such as federal and state agencies. Based on this initial analysis, the teams identified a total of five natural hazards which pose a significant threat to the planning area.

RISK ASSESSMENT

An initial risk assessment for Chemung County and the participating jurisdictions was completed in July 2018 and results were presented to Planning Team members at the Risk Assessment Workshop held on July 25, 2018. At the workshop, the characteristics and consequences of each hazard were evaluated to determine the extent to which the planning area would be affected in terms of potential danger to property and citizens.

Potential dollar losses from each hazard were estimated using NOAA's National Centers for Environmental Information (NCEI). The damages given are for property and crop damage. The resulting risk assessment profiled hazard events provided information on previous occurrences, estimated probability of future events, and detailed the spatial extent and magnitude of impact on people and property. Each participant at the Risk Assessment Workshop was provided a risk ranking sheet that asked participants to rank hazards in

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terms of the probability or frequency of occurrence, extent of spatial impact, and the magnitude of impact. The results of the ranking sheets identified unique perspectives on varied risks throughout the planning area.

The assessments were also used to set priorities for hazard mitigation actions based on potential loss of lives and dollar losses. A hazard profile and vulnerability analysis for each of the hazards can be found in Sections 5 through 9.

MITIGATION REVIEW AND DEVELOPMENT

Developing the Mitigation Strategy for the Plan involved identifying mitigation goals and new mitigation actions. A Mitigation Workshop was held at the Big Flats Community Center on October 4, 2018. In addition to the Planning Team, stakeholder groups were invited to attend the workshop. Regarding hazard mitigation actions, Workshop participants emphasized the desire for flood, tornado, winter storm, landslide and thunderstorm wind projects. Additionally, the County and participating jurisdictions were proactive in identifying mitigation actions to lessen the risk of all the identified hazards included in the Plan.

An inclusive and structured process was used to develop and prioritize new hazard mitigation actions for the Plan. The prioritization method was based on FEMA's STAPLE+E criteria and included social, technical, administrative, political, legal, economic, and environmental considerations. As a result, each Planning Team Member assigned an overall priority to each hazard mitigation action. The overall priority of each action is reflected in the hazard mitigation actions found in Section 12.

Planning Team Members then developed action plans identifying proposed actions, costs and benefits, the responsible organization(s), effects on new and existing buildings, implementation schedules, priorities, and potential funding sources.

Specifically, the process involved:

- Listing optional hazard mitigation actions based on information collected from previous plan reviews, studies, and interviews with federal, state, and local officials. Workshop participants reviewed the optional mitigation actions and selected actions that were most applicable to their area of responsibility, cost-effective in reducing risk, easily implemented, and likely to receive institutional and community support.
- Workshop participants inventoried federal and state funding sources that could assist in implementing the proposed hazard mitigation actions. Information was collected, including the program name, authority, purpose of the program, types of assistance and eligible projects, conditions on funding, types of hazards covered, matching requirements, application deadlines, and a point of contact.
- Planning Team Members considered the benefits that would result from implementing the hazard mitigation actions compared to the cost of those projects. Although detailed cost-benefit analyses were beyond the scope of the Plan, Planning Team Members utilized economic evaluation as a determining factor between hazard mitigation actions.
- Planning Team Members then selected and prioritized mitigation actions.

Hazard mitigation actions identified in the process were made available to the Planning Team for review. The draft Plan was made available to the general public for review on Chemung County's website, as well as having a hard copy available in Chemung Office of Fire and Emergency Management. An email and phone number were provided for the public to provide feedback.

REVIEW AND INCORPORATION OF EXISTING PLANS

REVIEW

Background information utilized during the planning process included various studies, plans, reports, and technical information from sources such as FEMA, the United States Army Corps of Engineers (USACE), the U.S. Fire Administration, National Oceanic and Atmospheric Administration (NOAA), the New York State Department of Environmental Conservation (DEC), the New York State Office of Parks, Recreation and Historic Preservation, the New York State Division of Homeland Security and Emergency Services (DHSES), and local hazard assessments and plans. Section 4 and the hazard-specific sections of the Plan (Sections 5 through 9) summarize the relevant background information.

Specific background documents, including those from FEMA, provided information on hazard risk, hazard mitigation actions currently being implemented, and potential mitigation actions. Previous hazard events, occurrences, and descriptions were identified through NOAA's National Centers for Environmental Information (NCEI). Results of past hazard events were found through searching the NCEI. The USACE studies were reviewed for their assessment of risk and potential projects in the region. Cornell University's Program on Applied Demographics documents were used to obtain population projections. The Program on Applied Demographics webpages were reviewed for population and other projections and included in Section 3 of the Plan. Materials from FEMA and DHSES were reviewed for guidance on Plan development requirements.

INCORPORATION OF EXISTING PLANS INTO THE HMAP PROCESS

A Capability Assessment was completed by key Chemung County and participating jurisdictions' departments which provided information pertaining to existing plans, policies, ordinances, and regulations to be integrated into the goals and objectives of the Plan. The relevant information was included in a master Capability Assessment, Appendix E.

Existing projects and studies were utilized as a starting point for discussing hazard mitigation actions among Planning and Consultant Team members. For example, the Capital Improvements Plan for each jurisdiction was reviewed to include any mitigation actions within this plan. Additionally, policies and ordinances were reviewed by the County and the City. Other plans were reviewed, such as Floodplain Management Plans and Transportation Plans, to identify any additional mitigation actions. Finally, the 2012 Chemung County All-Hazard Mitigation Plan was discussed in the initial planning meeting in order to develop a specific group of hazards to address in the planning effort. The 2014 New York State Hazard Plan was also used as a guidance document, along with FEMA materials, in the development of the Chemung County Plan.

INCORPORATION OF THE HMAP INTO OTHER PLANNING MECHANISMS

Planning Team members will integrate implementation of the Plan with other planning mechanisms for Chemung County, such as the Comprehensive Emergency Management Plan. Existing plans for Chemung County will be reviewed and incorporated into the Plan, as appropriate. This section discusses how the Plan will be implemented by Chemung County and the participating jurisdictions. It also addresses how the Plan will be evaluated and improved over time, and how the public will continue to be involved in the hazard mitigation planning process.

Chemung County and the participating jurisdictions will be responsible for implementing hazard mitigation actions contained in Section 12. Each hazard mitigation action has been assigned to a specific County, City, Town or Village department that is responsible for tracking and implementing the action.

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A funding source has been listed for each identified hazard mitigation action and may be utilized to implement the action. An implementation time period has also been assigned to each hazard mitigation action as an incentive and to determine whether actions are implemented on a timely basis.

Chemung County and the participating jurisdictions will integrate hazard mitigation actions contained in the Plan with existing planning mechanisms such as Emergency Operations or Management Plans, Evacuation Plans, and other local and area planning efforts. Chemung County will work closely with area organizations to coordinate implementation of hazard mitigation actions that benefit the planning area in terms of financial and economic impact.

Upon formal adoption of the Plan, Planning Team members from Chemung County and the participating jurisdictions will review existing plans along with building codes to guide development and ensure that hazard mitigation actions are implemented. Each of the jurisdictions will be responsible for coordinating periodic review of the Plan with members of the Advisory Planning Team to ensure integration of hazard mitigation strategies into these planning mechanisms and codes. The Planning Team will also conduct periodic reviews of various existing planning mechanisms and analyze the need for any amendments or updates in light of the approved Plan. Chemung County and the participating jurisdictions will ensure that future long-term planning objectives will contribute to the goals of the Plan to reduce the long-term risk to life and property from moderate and high-risk hazards. Within one year of formal adoption of the Plan, existing planning mechanisms will be reviewed and analyzed as they pertain to the Plan.

Planning Team members will review and revise, as necessary, the long-range goals and objectives in its strategic plan and budgets to ensure that they are consistent with the Plan.

Furthermore, Chemung County will work with neighboring jurisdictions to advance the goals of the Plan as it applies to ongoing, long-range planning goals and actions for mitigating risk to natural hazards throughout the planning area.

Table 2-2 identifies types of planning mechanisms and examples of methods for incorporating the Plan into other planning efforts.

Table 2-2. Examples of Methods of Incorporation

PLANNING MECHANISM	INCORPORATION OF PLAN
Grant Applications	The Plan will be evaluated by Chemung County and participating jurisdictions when grant funding is sought for mitigation projects. If a project is not in the Plan, an amendment may be necessary to include the action in the Plan.
Annual Budget Review	Various departments and key personnel that participated in the planning process for Chemung County and participating jurisdictions will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought, and mitigation actions that will be undertaken, according to the implementation schedule of the specific action.

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PLANNING MECHANISM	INCORPORATION OF PLAN
Regulatory Plans	Currently, Chemung County and participating jurisdictions have regulatory plans in place, such as Emergency Operations Plans, Continuity of Operations Plans, Economic Development, and Evacuation Plans. The Plan will be consulted when County, City, Town or Village departments review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.
Capital Improvement Plans	Chemung County and participating jurisdictions have a Capital Improvement Plan (CIP) in place. Prior to any revisions to the CIP, County, City, Town, or Village departments will review the risk assessment and mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.
Comprehensive Plans	Chemung County has a Long-term Comprehensive Development Plan in place. Since comprehensive plans involve developing a unified vision for a community, the mitigation vision and goals of the Plan will be reviewed in the development or revision of a Comprehensive Plan.
Floodplain Management Plans	Floodplain management plans include preventative and corrective actions to address the flood hazard. Therefore, the actions for flooding, and information found in Section 7 of this Plan discussing the people and property at risk to flood, will be reviewed and revised when Chemung County, as well as each participating jurisdiction, updates their management plans or develops new plans.

Appendix E provides an overview of Planning Team members' existing planning and regulatory capabilities to support implementation of mitigation strategy objectives. Appendix E also provides further analysis of how each intends to incorporate hazard mitigation actions into existing plans, policies, and the annual budget review as it pertains to prioritizing grant applications for funding and implementation of identified hazard mitigation projects.

PLAN REVIEW AND PLAN UPDATE

As with the development of Plan, Chemung County will oversee the review and Plan update process to ensure the relevance of the plan and to make adjustments to the plan as necessary. At the beginning of each fiscal year, Planning Team Members will meet to evaluate the Plan and review other planning mechanisms to ensure consistency with long-range planning efforts. In addition, planning participants will also meet twice a year by conference call or presentation to re-evaluate prioritization of the hazard mitigation actions.

TIMELINE FOR IMPLEMENTING MITIGATION ACTIONS

The Planning Team (Table A-1, Appendix A) will engage in discussions regarding a timeframe for how and when to implement each hazard mitigation action. Considerations include when the action will be started,

SECTION 2: PLANNING PROCESS

how existing planning mechanisms' timelines affect implementation, and when the action should be fully implemented. Timeframes may be general, and there will be short, medium, and long-term goals for implementation based on prioritization of each action, as identified on individual Hazard Mitigation Action worksheets included in the Plan for Chemung County and participating jurisdictions.

The Planning Team will evaluate and prioritize the most suitable hazard mitigation actions for the community to implement. The timeline for implementation of actions will partially be directed by Chemung County's comprehensive planning process, budgetary constraints, and community needs. Chemung County and the participating jurisdictions are committed to addressing and implementing hazard mitigation actions that may be aligned with and integrated into the Plan.

Overall, the Planning Team is in agreement that goals and actions of the Plan shall be aligned with the timeframe for implementation of hazard mitigation actions with respect to annual review and updates of existing plans and policies.

PUBLIC AND STAKEHOLDER INVOLVEMENT

An important component of hazard mitigation planning is public participation and stakeholder involvement. Input from individual citizens and the community as a whole provides the Planning Team with a greater understanding of local concerns and increases the likelihood of successfully implemented hazard mitigation actions. If citizens and stakeholders, such as local businesses, non-profits, hospitals, and schools are involved, they are more likely to gain a greater appreciation of the risks that hazards may present in their community and take steps to reduce or mitigate their impact.

The public was involved in the development of Chemung County's Plan at different stages prior to official Plan approval and adoption. Public input was sought using three methods: (1) open public meetings; (2) survey instruments; and (3) making the draft Plan available for public review at Chemung County's website along with a hard copy at the Chemung Office of Fire and Emergency Management.

The draft Plan was made available to the general public for review and comment on Chemung County's website and at their office. An email and phone number were provided for the public to provide feedback. The public was notified at the public meetings that the draft Plan would be available for review. No feedback was received on the draft Plan, although it was given on the public survey and all relevant information was incorporated into the Plan.

The Plan will be advertised and posted on Chemung County's website upon approval from FEMA. Annual meeting will be held that the public will be invited to attend.

STAKEHOLDER INVOLVEMENT

Stakeholder involvement is essential to hazard mitigation planning since a wide range of stakeholders can provide input on specific topics and from various points of view. Throughout the planning process, members of community groups, local businesses, neighboring jurisdictions, schools, and hospitals were invited to participate in development of the Plan. The Stakeholder Group (Table A-2 in Appendix A, and Table 2-3, below), included a broad range of representatives from both the public and private sector and served as a key component in Chemung County's outreach efforts for development of the Plan. Documentation of stakeholder meetings is found in Appendix D. A list of organizations invited to attend via e-mail is found in Table 2-3.

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Table 2-3. Stakeholder Working Group

AGENCY	TITLE
Able 2	Residential Services
Able 2	Environmental Services
AIM Independent Living Center	Executive Director
Arnot Hospital/St. Joseph Hospital	Emergency Manager/Security
Capabilities	Vocational Services
Chemung ARC	Emergency Planning
Chemung County Chamber of Commerce	President and Chief Executive Officer
Corning Hospital	Emergency Planner
County Soil & Water Conservation District	Mitigation Coordinator
Economic Opportunity Program	Chief Executive Officer
Elmira College	Office of Student Life
Elmira Heights School District	Superintendent
Elmira School District	Superintendent
Food Bank of the Southern Tier	President and Chief Executive Officer
Horseheads School District	Superintendent
Southern Tier Association for the Visually Impaired	President and Chief Executive Officer
Southern Tier Economic Growth	Executive Director
Spencer-Van Etten School District	Superintendent
STC BOCES	District Superintendent
STC Regional Planning and Development	Executive Director
STC Regional Planning and Development	Tri-county Flood Mitigation Specialist
Stormwater Coalition	Stormwater Coalition
United Way of the Southern Tier	Chief Executive Officer
Village of Van Etten	Mayor
Village of Van Etten	Highway Superintendent
Village of Van Etten	Code Enforcement Officer

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Stakeholders and participants from neighboring communities that attended the Planning Team and public meetings played a key role in the planning process. For example, flood was one of the major concerns for the stakeholders so the County included several actions to implement stream stabilization, ditch stabilization, stormwater detention basin, and stormwater debris basin programs in conjunction with The Chemung County Soil and Water District. Additionally, some local jurisdictions included local flood mitigation projects.

PUBLIC MEETINGS

A series of public meetings were held throughout the planning area to collect public and stakeholder input. Topics of discussion included the purpose of hazard mitigation, discussion of the planning process, and types of natural hazards. Representatives from area neighborhood associations and area residents were invited to participate. Additionally, Chemung County utilized social media sources including Facebook, Twitter, and the local media to increase public participation in the Plan development process. Documentation on the public meetings are found in Appendix D.

Public meetings were held on the following dates and locations:

- April 12, 2018, Big Flats Community Center
- July 25, 2018, Big Flats Community Center
- October 4, 2018 Big Flats Community Center

PUBLIC PARTICIPATION SURVEY

In addition to public meetings, the Planning and Consultant Teams developed a public survey designed to solicit public input during the planning process from citizens and stakeholders and to obtain data regarding the identification of any potential hazard mitigation actions or problem areas. The survey was promoted by local officials and a link to the survey was posted on Chemung County's website. A total of 34 surveys were completed online. The survey results are analyzed in Appendix B. Chemung County reviewed the input from the surveys and decided which information to incorporate into the Plan as hazard mitigation actions. For example, many citizens mentioned concerns about flooding and suggested drainage improvements, such as creating proper drainage or keeping ditches free of debris to reduce potential flooding. In response to the public input, several actions were added to the plan to implement drainage improvements and flood control measures throughout the County and participating jurisdictions, including increasing dimensions of drainage culverts and implementing stream restoration/channelization program.

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OVERVIEW

The Battle of Newtown was fought on the hillside south of Elmira in 1779. The battle was between American troops and native Americans (allies of England). The Americans won this battle, it is considered one of the most important of the Revolutionary War. This accomplishment opened the area for settlements. Many soldiers returned to the area after the war and made it their home. Other's came from Wilkes-Barre, PA, Orange County New York and Connecticut. In the early 1800s the Chemung Canal and the Erie Railway were built to increase communications to the rest of the country. Business sprouted. The primary product of the area was white pine lumber. Chemung County was formed March 29, 1836. Elmira was a noted station of the underground railroad due to its location. It was named the "gateway between the North and South. It was on the route between Canada and the southern states (Virginia and the Carolinas). For the same reason it was the location for a Civil War prison camp called "The Rebel Prison Camp". 2,988 southern native prisoners were buried in Woodlawn Cemetery. Elmira College for Women was authorized in 1855 to be the first institution in the country chartered to grant women college degrees.¹

Chemung County gets its name from a Seneca term meaning "Big Horn". The name was devised after an object resembling a Woolly Mammoth's large horn was found in the banks of the river. Due to its location at the southern end of the Finger Lakes Region, it is currently known as "Gateway to the Finger Lakes". Chemung County is also known as "Mark Twain Country" because he spent summers and wrote in Elmira. His Wife Olivia Langdon grew up in Elmira and Twain would come to visit her family in the summers.

Chemung County is known as the "Soaring Capital of America", national sailplane competitions have been held there since 1930. The County consists of the City of Elmira, eleven towns, and five villages. The County has a total area of 412 square miles, of which 407.35 square miles is land and 3.43 square miles (0.8 percent) is water.

The County lies in the Allegheny Plateau region of New York State. A series of hills forming spurs of the Allegheny Mountains are defined in the county. The county contains abrupt hills separated by narrow ravines. The Chemung River flows within the county



¹ <https://archive.org/details/briefhistoryofch00town/page/n11-118>

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surrounded by fertile farm land. The area near the river is a floodplain. Birch, beech, basswood, white oak, and maple trees are found in the region.

Figure 3-1 shows the general location of Chemung County, along with the Cities that are located within the County.

Figure 3-1. Location of Chemung County Planning Area

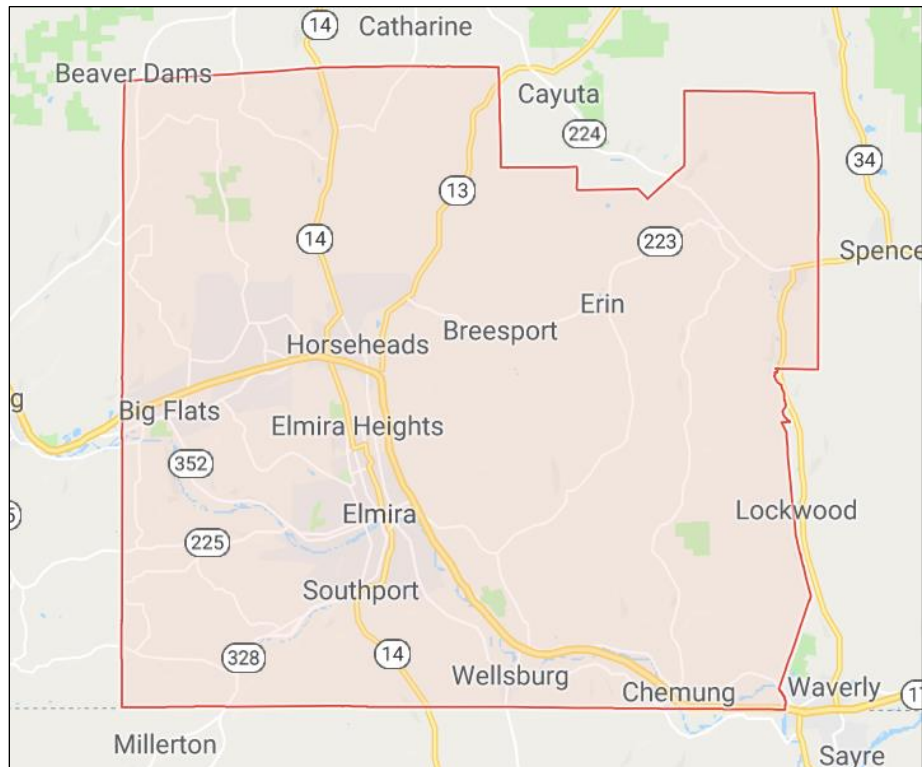
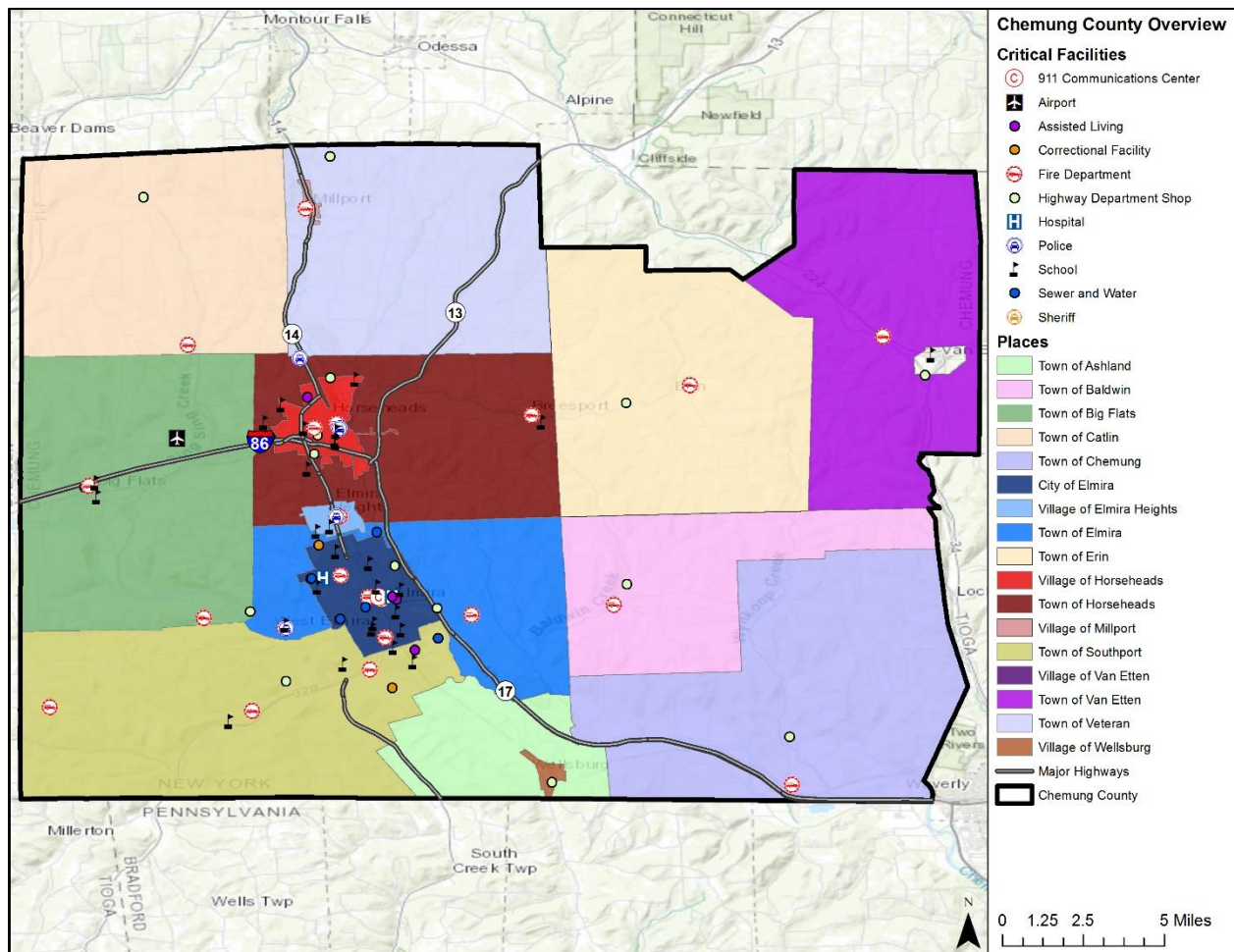


Figure 3-2 shows the Chemung County Study Area, including the participating jurisdictions that are covered in the risk assessment analysis of the Plan.

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Figure 3-2. Location of Chemung County Study Area



Provided in Table 3-1 below is a listing of the jurisdictions in Chemung County that participated in the Hazard Mitigation Plan.

Table 3-1. Participating Jurisdictions

PARTICIPATING JURISDICTIONS
Chemung County
Town of Ashland
Town of Baldwin
Town of Big Flats
Town of Catlin
Town of Chemung

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PARTICIPATING JURISDICTIONS
City of Elmira
Town of Elmira
Village of Elmira Heights
Town of Erin
Town of Horseheads
Village of Horseheads
Village of Millport
Town of Southport
Town of Van Etten
Town of Veteran
Village of Wellsburg

POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, Chemung County had a population of 88,830 residents. By July 2015, the number had dropped to 87,030, and by July 2016, the population was 85,557. Table 3-2 provides the population distribution by jurisdiction within Chemung County.²

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

Table 3-2. Population Distribution by Jurisdiction

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE ³	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Ashland	1,695	1.9%	154	269
Town of Baldwin	832	0.9%	70	55

² Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

³ Percentages are based on city and town populations only.

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JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE ³	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Big Flats	7,731	8.7%	134	471
Town of Catlin	2,618	2.9%	70	280
Town of Chemung	2,563	2.9%	134	268
City of Elmira	29,200	32.9%	2,086	7,912
Town of Elmira	6,934	7.9%	1,355	448
Village of Elmira Heights	4,097	N/A	248	458
Town of Erin	1,962	2.2%	288	196
Town of Horseheads	19,485	21.9%	3,695	1,593
Village of Horseheads	6,461	N/A	1,521	675
Village of Millport	312	N/A	40	77
Town of Southport	10,940	12.3%	1,837	1,198
Town of Van Etten	1,557	1.8%	206	181
Town of Veteran	3,313	3.7%	544	308
Village of Wellsburg	580	N/A	77	170
CHEMUNG COUNTY TOTAL	88,830	100%	11,664	14,531

POPULATION GROWTH

The official 2010 Chemung County population is 88,830. Overall, Chemung County experienced a decrease in population between 1980 and 2010 by 9%, or a decrease by 8,826 people. The City of Elmira experienced a decrease in population from 1980 to 2010. Between 2000 and 2010, Chemung County and the City of Elmira experienced additional decrease in population. Table 3-3 provides historic change rates in Chemung County.

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Table 3-3. Population for Chemung County, 1980-2010

JURISDICTIONS	1980 ⁴	1990 ⁵	2000 ⁶	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000- 2010	PERCENT OF CHANGE
Town of Ashland	1,967	1966	1,951	1,695	-272	-13.8%	-256	-13.1%
Towns of Baldwin	892	829	853	832	-60	-6.7%	-21	-2.5%
Town of Big Flats	7,649	7596	7,224	7,731	82	1.1%	507	7.0%
Town of Catlin	2,719	2626	2,649	2,618	-101	-3.7%	-31	-1.2%
Town of Chemung	2,436	2540	2,665	2,563	127	5.2%	-102	-3.8%
City of Elmira	35,327	33,724	30,940	29,200	-6,127	-17.3%	-1,740	-5.6%
Town of Elmira	7,635	7440	7,199	6,934	-701	-9.2%	-265	-3.7%
Village of Elmira Heights	4,279	4,359	4,170	4,097	-182	-4.3%	-73	-1.8%
Town of Erin	2,037	2002	2,054	1,962	-75	-3.7%	-92	-4.5%
Town of Horseheads	20,238	19,926	19,561	19,485	-753	-3.7%	-76	-0.4%
Village of Horseheads	7,348	6,802	6,452	6,461	-887	-12.1%	9	0.1%
Village of Millport	N/A	N/A	297	3 12	N/A	N/A	N/A	N/A
Town of Southport	11,586	11,571	11,185	10,940	-646	-5.6%	-245	-2.2%
Town of Van Etten	1,519	1,507	1,518	1,557	38	2.5%	39	2.6%
Town of Veteran	3,651	3,468	3,271	3,313	-338	-9.3%	42	1.3%
Village of Wellsburg	N/A	N/A	631	580	N/A	N/A	N/A	N/A
COUNTY TOTAL	97,656	95,195	91,070	88,830	-8,826	-9.0%	-2,240	-2.5%

FUTURE DEVELOPMENT

To better understand how future growth and development in the County might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

⁴ https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

⁵ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁶ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

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Population projections from 2010 to 2040 are listed in Table 3-4, as provided Cornell University's Program on Applied Demographics⁷. This information is only available at the County level; however, the population projection shows a decrease in population density for the County, which would mean overall decline for the County.

Table 3-4. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

ECONOMIC IMPACT

Building and maintaining infrastructure depends on the economy, and therefore, it is important to Chemung County to protect infrastructure from risk due to natural hazards in the planning area. Whether it's expanding culverts under a road that washes out during flash flooding, shuttering a fire station, or flood-proofing a wastewater facility, infrastructure must be mitigated from natural hazards in order to continue providing essential utility and emergency response services in a fast-growing planning area.

Employers in the area are critical to the health of the economy, as well as effective transportation connectivity. The City of Elmira is centrally located in Chemung County, and traverses the Southern Tier Expressway (I86), making the city prime for business. Interstate 86 runs east-west through Chemung County providing highway access to the region increasing development potential for commerce.

Chemung County welcomes new businesses through Southern Tier Economic Growth (STEG). STEG has been an important part of the community for 75 years and is positioned to promote the growth and vitality of the region.

The Chemung County Industrial Development Agency (CCIDA) is a Public Benefit Corporation of the State of New York. Industrial Development Agencies were formed by a "Special Act" of the New York State Legislature in 1972 and are governed by the New York State Industrial Development Act to provide financial incentives to projects that have a positive economic impact on a community. The Chemung County IDA was created in 1975 by this special act at the request of the Chemung County legislature. STEG provides staff support to CCIDA.

Chemung County also collaborated with Schuyler and Steuben Counties by establishing the Southern Tier Central Regional Planning and Development Board (STC). STC works with local government, economic and community development organizations, and human services agencies to identify issues and provide solutions that will improve the economy, the environment, and the quality of life in the STC region.

⁷ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

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Chemung County also participates in the Southern Tier Regional Economic Development Council (STREDC) supporting Governor Cuomo's new Regional Council strategy. Chemung County is a part of the Southern Tier Region led by Tom Tranter, the President & CEO of Corning Enterprises and Dr. Harvey Stenger, President of Binghamton University. These strategies focus on developing certain industry clusters; helping people in distressed Opportunity Areas to overcome barriers to entry into the workforce; promoting veterans' participation in the workforce; and implementing regional sustainable growth strategies.

Through active involvement in the previously mentioned organizations Chemung County's focus of economic development targets:

- Improving the standard of living and reducing poverty rates
- Recruiting and maintaining a talented workforce
- Increasing the overall employment base of the community
- Keeping the dollars spent on goods and services local
- Growing and diversify the tax base
- Keeping the tax rate as low as practical

More recently a \$58 million renovation of the Elmira Corning Regional Airport's terminal has been completed. Downtown Elmira received \$10 million for the Downtown Revitalization and successes in the tech-focused I-86 Innovation Corridor are additional focused initiatives to bring new businesses and jobs to the area.

EXISTING AND FUTURE LAND USE AND DEVELOPMENT TRENDS

The Town of Big Flats, the Village of Horseheads, and additional jurisdictions have Master or Comprehensive Plans in place. These plans are part of a continuous process to provide an environment for the citizens and to consider the general desire of the community to conserve, preserve, and protect the natural environment. These plans are used to guide individuals in making decisions which affect the community with the understanding of the long-term effects.

Chemung County has a Planning Department which is responsible for long range planning efforts. These include planning for future development and demographic trends, environmental reviews, transportation planning services, dissemination of population and land data, and assists community members with NFIP needs.

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HAZARD DESCRIPTION

Section 4 is the first phase of the Risk Assessment and provides background information for the hazard identification process and descriptions for the hazards identified. The Risk Assessment continues with Sections 5 through 9, which include hazard descriptions and vulnerability assessments.

Upon a review of the full range of natural hazards suggested under FEMA planning guidance, Chemung County and the participating jurisdictions identified five natural hazards that are addressed in the Hazard Mitigation Plan. Of the hazards identified, five natural hazards were identified as significant, as shown in Table 4-1. The hazards were identified through input from Planning Team members and a review of the current 2012 Chemung County All-Hazard Mitigation Plan. Readily available online information from reputable sources such as federal and state agencies were also evaluated and utilized to supplement information as needed.

In general, there are four main categories of hazards: atmospheric, geologic, hydrologic, and technological. Atmospheric hazards are events or incidents associated with weather generated phenomenon. Atmospheric hazards that have been identified as significant for the Chemung County include tornado, winter storm, thunderstorm (including wind, hail and lightening) (Table 4-1).

Geologic hazards are events or incidents associated with the earth's crust. The geologic hazards identified as significant consist of earthquakes and landslides. The geologic hazard that has been identified as significant for the county is landslide.

Hydrologic hazards are events or incidents associated with water related damage and account for over 75 percent of Federal disaster declarations in the United States. The hydrologic hazard identified as significant for the county is flood.

Technological hazards refer to the origins of incidents that can arise from human activities, such as the construction and maintenance of dams. They are distinct from natural hazards primarily because they originate from human activity. The risks presented by natural hazards may be increased or decreased as a result of human activity, however they are not inherently human-induced. Therefore, dam failure is classified as a quasi-technological hazard and referred to as "technological."

The County of Chemung, including all participating jurisdictions, decided not put dam failure in the Hazard Mitigation Plan. The County Soil and Water Conservation District and Storm Water Engineer work with County Buildings and Grounds, Emergency Management and the municipalities and first responders to ensure all required maintenance, emergency planning and awareness training, and annual inspections are completed and up to date for all dams posing a risk to the planning area.

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All of the dams have specific Operation and Maintenance Plans, and Emergency Action Plans that address numerous dam failure scenarios. Therefore, the planning team did not feel dam failure needed to be included in this plan, as it is adequately covered by current actions and plans. Each dam in question has had a recent state required engineering study completed as well. All dams in the planning area are inspected annually. Additionally, the dams/levees in the planning area are inspected annually by NYS Department of Environmental Conservation, Army Corp of Engineers, and County/municipal officials with portions of the levee in their jurisdictions.

Table 4-1. Hazard Descriptions

HAZARD	DESCRIPTION
ATMOSPHERIC	
Hail	Hailstorm events are a potentially damaging outgrowth of severe thunderstorms. During the developmental stages of a hailstorm, ice crystals form within a low pressure front due to the rapid rising of warm air into the upper atmosphere, and the subsequent cooling of the air mass. Frozen droplets gradually accumulate into ice crystals until they fall as precipitation that is round or irregularly shaped masses of ice typically greater than 0.75 inches in diameter.
Lightning	Lightning is a sudden electrostatic discharge that occurs during an electrical storm. This discharge occurs between electrically charged regions of a cloud, between two clouds, or between a cloud and the ground.
Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. The destruction caused by tornadoes ranges from light to catastrophic, depending on the location, intensity, size, and duration of the storm.
Thunderstorm Wind	A thunderstorm occurs when an observer hears thunder. Radar observers use the intensity of the radar echo to distinguish between rain showers and thunderstorms. Lightning detection networks routinely track cloud-to-ground flashes, and therefore thunderstorms.
Winter Storm	Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 miles per hour, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads, and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.
GEOLOGIC	
Landslide	A landslide is a geological phenomenon where there is down slope movement of mass rock, debris, or earth. They usually occur in conjunction with other natural hazards, such as earthquakes, volcanoes, wildfires, and floods. Landslides occur nationwide, causing \$1-2 billion in damages with more than 25 fatalities on average each year.

HAZARD	DESCRIPTION
HYDROLOGIC	
Flood	The accumulation of water within a body of water, which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine flooding, coastal flooding, and shallow flooding.

NATURAL HAZARDS AND CLIMATE CHANGE

Climate change is defined as a long-term hazard which can increase or decrease the risk of other weather hazards. It directly endangers property due to sea level rise and biological organisms due to habitat destruction.

Global climate change is expected to exacerbate the risks of certain types of natural hazards impacted through rising sea levels, warmer ocean temperatures, higher humidity, the possibility of stronger storms, and an increase in wind and flood damages due to storm surges. While sea level rise is a natural phenomenon and has been occurring for several thousand years, the general scientific consensus is that the rate has increased in the past 200 years, from 0.5 millimeters per year to 2 millimeters per year.

New York's ClimAID is the organization charged with providing decision makers information on the state's vulnerabilities and to facilitate the development of adaptation strategies. According to New York's ClimAid analysis, heat waves are predicted to increase, and New York has already experienced a significant warming trend across the state. Winter snow cover is decreasing, and spring is a week or so earlier on average than a few decades ago. In many areas of New York, blooming dates have advanced by as much as eight days. Intense precipitation events (heavy downpours) are occurring more often, leading to more frequent and intense flooding that threatens public safety and damages developed areas, roadways, and other infrastructure, as well as natural systems and protective barriers. As climate continues to change, we may experience more frequent and more severe droughts between these extreme precipitation events. Ranges of plants and animals will shift, changing New York's suite of native species as well as agricultural products.

The Southern Tier region of New York has unique attributes that will be affected by climate change. Chemung County is within Region 3 for their analysis. Climate models suggest Chemung County is projected to see affects from Susquehanna River flooding increases along with invasion of insects, weeds and other pests moving northward. Average temperature increases of 3.5 to 5.5 degrees by 2050s and 4.5 to 8.5 degrees by the 2080s should be expected. Average precipitation increases 0% to 10% by the 2050s and 5% to 10% by the 2080s are expected. Additional updated projections for New York State and specifically Region 3 can be found in the ClimAid's most recent publication; *Responding to Climate Change in New York State*.¹

When considering level of risk, frequency of occurrence, and cost to recover; flooding was identified as each jurisdiction's largest exposure. Each jurisdiction created a hazard mitigation action to address this

¹ <https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Environmental/EMEP/climaid/ClimAID-Report.pdf>

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concern. All participating jurisdictions, including the county, have developed a temporary housing plan for residents displaced from a flood event. Each temporary housing plan has been included in Appendix F. In addition, Chemung County has developed a Comprehensive Emergency Management Plan that outlines evacuation and sheltering measures during hazard events.²

OVERVIEW OF HAZARD ANALYSIS

The methodologies utilized to develop the Risk Assessment are a historical analysis and a statistical approach. Both methodologies provide an estimate of potential impact by using a common, systematic framework for evaluation.

Records retrieved from National Centers for Environmental Information (NCEI) and National Oceanic and Atmospheric Administration (NOAA) were reported for Planning Area 2, including the participating jurisdictions. Remaining records identifying the occurrence of hazard events in the planning area and the maximum recorded magnitude of each event were also evaluated.

The use of geographic information system (GIS) technology to identify and assess risks for Planning Area 2 and evaluate community assets and their vulnerability to the hazards.

The four general parameters that are described for each hazard in the Risk Assessment include frequency of return, approximate annualized losses, a description of general vulnerability, and a statement of the hazard's impact.

Frequency of return was calculated by dividing the number of events in the recorded time period for each hazard by the overall time period that the resource database was recording events. Frequency of return statements are defined in Table 4-2, and impact statements are defined in Table 4-3 below.

Table 4-2. Frequency of Return Statements

PROBABILITY	DESCRIPTION
Highly Likely	Event is probable in the next year.
Likely	Event is probable in the next three years.
Occasional	Event is probable in the next five years.
Unlikely	Event is probable in the next ten years.

Table 4-3. Impact Statements

POTENTIAL SEVERITY	DESCRIPTION
Substantial	Multiple deaths. Complete shutdown of facilities for 30 days or more. More than 50 percent of property destroyed or with major damage.

² The Chemung County Emergency Management Plan is not posted on their public website but is available in digital format at the discretion of the county, upon request.

SECTION 4: RISK OVERVIEW

POTENTIAL SEVERITY	DESCRIPTION
Major	Injuries and illnesses resulting in permanent disability. Complete shutdown of critical facilities for at least two weeks. More than 25 percent of property destroyed or with major damage.
Minor	Injuries and illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than one week. More than 10 percent of property destroyed or with major damage.
Limited	Injuries and illnesses are treatable with first aid. Shutdown of critical facilities and services for 24 hours or less. Less than 10 percent of property destroyed or with major damage.

Each of the hazard profiles includes a description of a general Vulnerability Assessment. Vulnerability is the total of assets that are subject to damages from a hazard, based on historic recorded damages. Assets in the region were inventoried and defined in hazard zones where appropriate. The total amount of damages, including property and crop damages, for each hazard is divided by the total number of assets (building value totals) in that community to determine the percentage of damage that each hazard can cause to the community.

Hazard Vulnerability for Chemung County was reviewed based on recent development changes that occurred throughout the County. To better understand how future growth and development in the County might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts.

Once loss estimates and vulnerability were known, an impact statement was applied to relate the potential impact of the hazard on the assets within the area of impact.

HAZARD RANKING

Table 4-4 portrays the results of the County's self-assessment for hazard ranking, based on the preliminary results of the risk assessment presented at the Risk Assessment Workshop. This table also takes into account local knowledge regarding frequency of occurrence and the potential impact of each hazard.

Table 4-4. Hazard Risk Ranking

HAZARD	FREQUENCY OF OCCURENCE	POTENTIAL SEVERITY	RANKING
Flood	Highly Likely	Limited	High
Winter Storm	Highly Likely	Limited	Moderate
Thunderstorm (including thunderstorm wind, hail, and lightning)	Highly Likely	Limited	Moderate
Landslide	Unlikely	Limited	Low
Tornado	Likely	Limited	Low

SECTION 5: WINTER STORM

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HAZARD DESCRIPTION



A Severe Winter Storm is defined as an event that occurs during the winter season that includes one or more of the following conditions: snow, ice, high winds, blizzard conditions, and other wintry conditions; causing physical damage or loss to improved property. It can range from a moderate snow over a few hours to a blizzard with blinding wind driven snow that can last for multiple days. During late October through mid-April, temperatures can range between 0° Fahrenheit and 32° Fahrenheit with

February having the greatest average snowfall. Cold moisture combined with high wind and large accumulations of snow cause “Lake Effect” storms. Lake Effect storms leave huge quantities of snow with a few days in its wake. They primarily affect the western and central region of New York but have been known to affect the eastern portion of the State, if the storm becomes large enough.¹

Chemung County experiences an annual average snowfall of 43.8 inches. The County is ranked at number 55 out of 62 counties in terms of average annualized losses resulting from winter storms. Chemung County is not identified by the State as being a location of extreme snowfall potential.

Winter storms that threaten the Chemung County Planning Area usually begin as powerful cold fronts that push south from central Canada. The entire Planning Area is at risk for heavy snow, ice hazards, extremely cold temperatures, and severe wind chill. The effects and frequencies of winter storm events range from generally mild and short-lived to significant, moderate term events. As indicated in Figure 5-1, on average, the Chemung County Planning Area, including all participating jurisdictions, typically experiences an average annual snowfall of less than 60 inches. The average low temperature for the planning area during

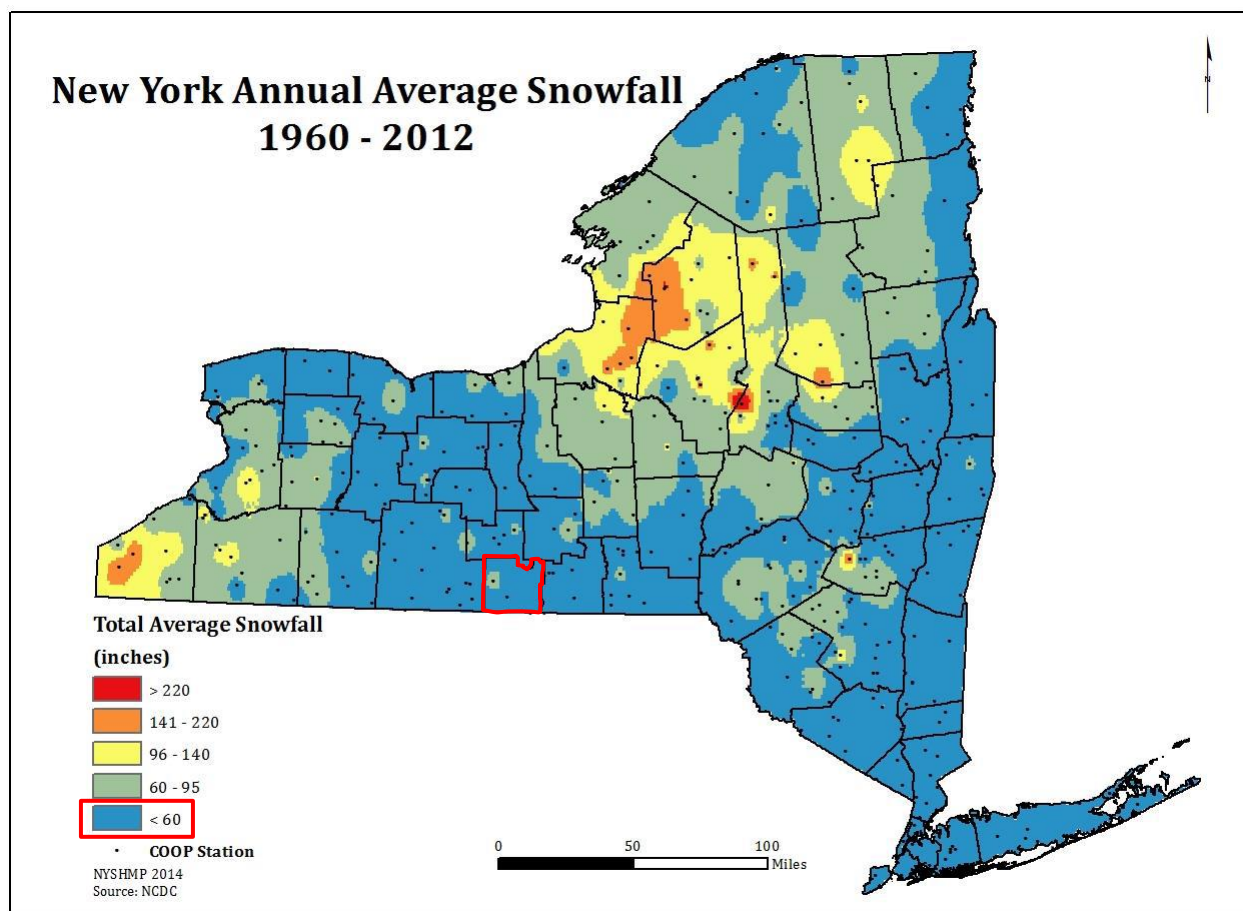
¹ 2014 New York State Hazard Mitigation Plan: <http://www.dhses.ny.gov/recovery/mitigation/plan.cfm>

SECTION 5: WINTER STORM

the months of November through March range from 15° and 30°F. Average snow fall during the same months range from 8 to 10 inches per month, with the greatest snowfall typically falling in March.²

Challenges caused by winter storms include hazardous driving conditions, downed trees and utility lines, and power outages. During times of ice and snow accumulation, response times will increase until public works road crews are able to make major roads passable. Table 5-1 describes the types of winter storms possible to occur in the Chemung County Planning Area, including all participating jurisdictions. It should be noted that flooding from the rapid melting of snow as well as related ice jams in the Chemung River are covered under the flood profile (Section 7) of this Plan.

Figure 5-1. Extreme Cold Days, 1960-2003³



² US Climate Data: <https://www.usclimatedata.com/climate/elmira/new-york/united-states/usny0463>

³ Source: NCEI. Chemung County Planning Area indicated by red outline.

Table 5-1. Types of Winter Storms

TYPE OF WINTER STORM	DESCRIPTION
Winter Weather Advisory	This alert may be issued for a variety of severe conditions. Weather advisories may be announced for snow, blowing or drifting snow, freezing drizzle, freezing rain, or a combination of weather events.
Winter Storm Watch	Severe winter weather conditions may affect your area (freezing rain, sleet, or heavy snow may occur separately or in combination).
Winter Storm Warning	Severe winter weather conditions are imminent.
Freezing Rain or Freezing Drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
Sleet	Small particles of ice usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
Blizzard Warning	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.
Frost/Freeze Warning	Below freezing temperatures are expected and may cause significant damage to plants, crops, and fruit trees.
Wind Chill	A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined cooling power of the wind and temperature on exposed flesh is called the wind-chill factor.

LOCATION

Winter storm events are not confined to specific geographic boundaries. Therefore, all existing and future buildings, facilities, and populations in the Chemung County Planning Area, including all participating jurisdictions, are considered to be exposed to a winter storm hazard and could potentially be impacted.

EXTENT

The extent or magnitude of a severe winter storm is measured in intensity based on the temperature and level of accumulations as shown in Table 5-2. Table 5-2 should be read in conjunction with the wind-chill factor described in Figure 5-2 to determine the intensity of a winter storm. The chart is not applicable when temperatures are over 50°F or winds are calm. This is an index developed by the National Weather Service.

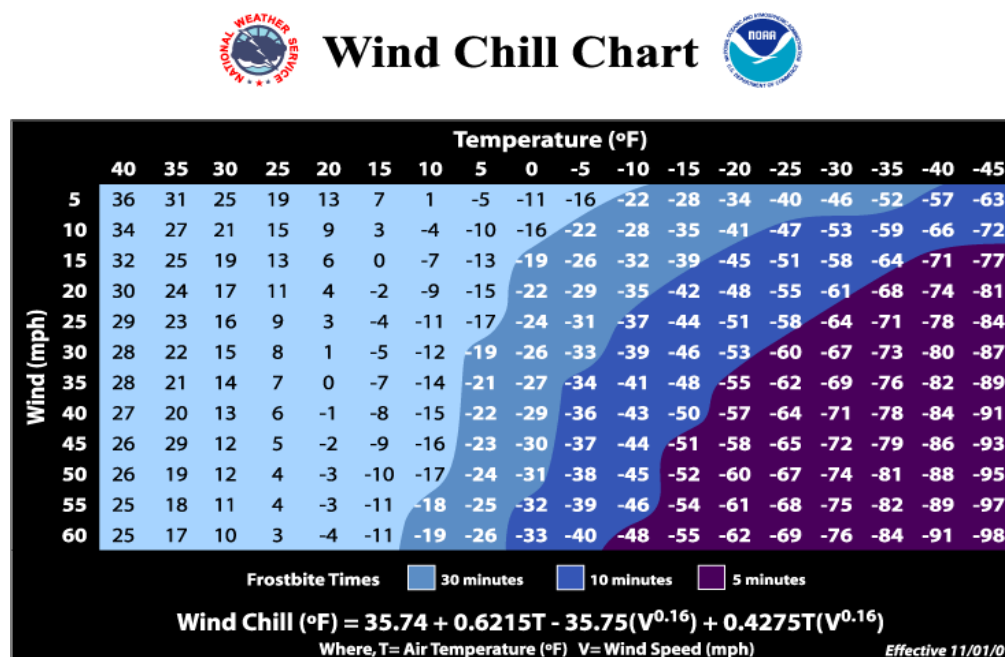
Table 5-2. Magnitude of Severe Winter Storms

INTENSITY	TEMPERATURE RANGE (Fahrenheit)	EXTENT DESCRIPTION
Mild	40° – 50°	Winds less than 10 mph and freezing rain or light snow falling for short durations with little or no accumulations

SECTION 5: WINTER STORM

INTENSITY	TEMPERATURE RANGE (Fahrenheit)	EXTENT DESCRIPTION
Moderate	30° – 40°	Winds 10 – 15 mph and sleet and/or snow up to 4 inches
Significant	25° – 30°	Intense snow showers accompanied with strong gusty winds between 15 and 20 mph with significant accumulation
Extreme	20° – 25°	Wind driven snow that reduces visibility, heavy winds (between 20 to 30 mph), and sleet or ice up to 5 millimeters in diameter
Severe	Below 20°	Winds of 35 mph or more and snow and sleet greater than 4 inches

Figure 5-2. Wind Chill Chart



Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a blustery 30°F day would feel just as cold as a calm day with 0°F temperatures. According to the National Centers for Environmental Information (NCEI) the Chemung County Planning Area, including all participating jurisdictions, has never experienced a blizzard, but based on 70 previous occurrences recorded from January 1996 through June 2018, it has been subject to heavy snow, ice storms, extreme wind chill, as well as various winter weather and storms.

The average number of cold days is similar for the entire planning area, including the county, cities, towns, and villages. Therefore, the intensity or extent of a winter storm event to be mitigated for the area ranges from significant to severe according to the definitions at Table 5-2. The Chemung County Planning Area, including all participating jurisdictions, can expect anywhere between 0.1 to 10.0 inches of ice and snow during a winter storm event and temperatures between 0° and 30°F with winds ranging from 10 to 35 mph.

HISTORICAL OCCURRENCES

Table 5-3 shows historical occurrences for the Chemung County Planning Area, including all participating jurisdictions from January 1996 through June 2018 provided by the NCEI database. There have been 73 recorded winter storm events in the planning area. Historical winter storm information, as provided by the NCEI, identifies winter storm activity across a multi-county forecast area for each event. The appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event. Historical winter storm data for the county, including all participating jurisdictions are provided on a County-wide basis per the NCEI database. Table 5-3 shows historical incident information for the planning area. Only those events that have reported death, injuries or property/crop damage are reported below.

Table 5-3. Historical Winter Storm Events, 1996-2018⁴

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Chemung County	3/12/1993	0	0	Unknown	Unknown
Chemung County	3/4/1994	0	0	Unknown	Unknown
Chemung County	1/2/1996	0	0	\$4,888	\$0
Chemung County	5/17/2002	0	0	\$4,198	\$0
Chemung County	1/1/2003	0	0	\$138,463	\$0
Chemung County	1/3/2003	0	0	\$415,390	\$0
Chemung County	2/17/2003	0	0	\$68,702	\$0
Chemung County	12/14/2003	0	0	\$40,953	\$0
Chemung County	1/10/2004	0	0	\$13,585	\$0
Chemung County	1/15/2004	0	0	\$13,585	\$0
Chemung County	2/3/2004	0	0	\$13,512	\$0
Chemung County	3/16/2004	0	0	\$26,850	\$0
Chemung County	1/6/2005	0	0	\$26,386	\$0
Chemung County	1/22/2005	0	0	\$26,386	\$0
Chemung County	3/1/2005	0	0	\$26,031	\$0
Chemung County	3/14/2018	0	0	Unknown	Unknown
TOTALS		0	0	\$818,929	

⁴ Values are in 2018 dollars.

SECTION 5: WINTER STORM

Based on the list of historical winter storm events for the Chemung County Planning Area, including all participating jurisdictions, 11 events have occurred since the 2012 Plan.

SIGNIFICANT EVENTS

May 17, 2002 – Chemung County

A cold front went through central New York the morning of May 17th. A surface low pressure area moved east across the Tennessee Valley on the 17th to the mid-Atlantic region early on the 18th. Precipitation in the form of rain was spread east and north ahead of the surface low on the 17th. The rain over central New York changed to wet snow from west to east starting late on the 17th. Accumulations were mostly over 1500 feet in elevation with up to 5 inches above 2000 feet in the Catskills.

February 17, 2003 – Chemung County

A coastal storm moved slowly up the east coast on the 16th and early on the 17th. Late on the 17th the storm picked up speed to be well off the northeast coast. Snow spread into the southern Catskills of New York during the evening of the 16th. The snow moved into the southern tier by 3 AM then to the New York Thruway in Syracuse and Utica around 7 AM. The snow was heavy at times on the 17th. The snow ended around midnight of the 17th. Snowfall rates were several inches an hour. Snowfall amounts were a widespread 10 to 20 inches from the Elmira Corning area east into the western Catskills. Further north snow amounts were mostly 6 to 12 inches.

PROBABILITY OF FUTURE EVENTS

According to historical records, the planning area experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Chemung County Planning Area, including all participating jurisdictions, is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

During periods of extreme cold and freezing temperatures, water pipes can freeze and crack, and ice can build up on power lines, causing them to break under the weight or causing tree limbs to fall on the lines. These events can disrupt electric service for long periods. An economic impact may occur due to increased consumption of heating fuel, which can lead to energy shortages and higher prices. House fires and resulting deaths tend to occur more frequently from increased and improper use of alternate heating sources. Fires during winter storms also present a greater danger because water supplies may freeze and impede firefighting efforts.

All populations, buildings, critical facilities, and infrastructure in the entire Chemung County Planning Area are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in each participating jurisdiction:

Table 5-4. Critical Facilities at Risk by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Chemung County	1 911 Communications Center, 1 Airport, 3 Correctional Facilities, 21 Fire Stations, 17 Highway Department Shops, 2 Hospitals, 5 Assisted Living Facilities, 6 Police Stations, 30 Schools, 6 Water/Wastewater Facilities
Town of Ashland	1 Highway Department Shop
Town of Baldwin	1 Fire Station, 1 Highway Department Shop
Town of Big Flats	1 Airport, 2 Fire Stations, 1 Highway Department Shop, 1 Schools
Town of Catlin	1 Fire Station, 1 Highway Department Shop
Town of Chemung	1 Fire Station, 1 Highway Department Shop
City of Elmira	1 911 Communication Center, 2 Correctional Facilities, 3 Fire Stations, 1 Highway Department Shop, 2 Hospitals, 2 Assisted Living Facilities, 2 Police Stations, 11 Schools, 4 Water/Wastewater Facilities
Town of Elmira	2 Fire Stations, 3 Highway Department Shop, 1 Police Station, 6 Schools, 1 Water/Wastewater Facility
Village of Elmira Heights	1 Fire Station, 1 Highway Department Shop, 1 Police Station, 3 Schools
Town of Erin	1 Fire Station, 1 Highway Department Shop
Town of Horseheads	1 Fire Station, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Police Station, 4 Schools
Village of Horseheads	2 Fire Stations, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Police Station, 4 Schools
Village of Millport	1 Fire Station
Town of Southport	1 Correctional Facility, 3 Fire Stations, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Water/Wastewater Facility
Town of Van Etten	1 Fire Station, 1 Highway Department Shop, 1 School
Town of Veteran	1 Fire Station, 1 Highway Department Shop
Village of Wellsburg	1 Highway Department Shop

People and animals are subject to health risks from extended exposure to cold air. Elderly people are at greater risk of death from hypothermia during these events, especially in the rural areas of the county where populations are sparse, icy roads may impede travel, and there are fewer neighbors to check in on the elderly. According to the U.S. Center for Disease Control, every year hypothermia kills about 600 Americans, half of whom are 65 years of age or older.

Population over 65 in the entire Chemung County Planning Area is estimated at 17.1% of the total population or an estimated total of 17,015⁵ potentially vulnerable residents in the planning area based on age (Table 5-5).

⁵ US Census Bureau 2016 data for Chemung Planning Area.

Table 5-5. Population at Greater Risk by Jurisdiction

JURISDICTION	POPULATION 65 AND OLDER
Town of Ashland	310
Town of Baldwin	176
Town of Big Flats	1,298
Town of Catlin	250
Town of Chemung	399
City of Elmira	3,228
Town of Elmira	1,834
Village of Elmira Heights	577
Town of Erin	299
Town of Horseheads	3,965
Village of Horseheads	1,590
Village of Millport	50
Town of Southport	1,900
Town of Van Etten	260
Town of Veteran	814
Village of Wellsburg	65
Chemung County Total	17,015

Historic loss, in 2018 dollars, is estimated at \$818,929 in damages over the 22.5-year recording period giving an approximate loss of \$36,397 in damages annually (Table 5-6). The potential severity of impact for the Chemung County Planning Area, including all participating jurisdictions, are limited meaning injuries are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10% of property destroyed or with major damage.

Table 5-6. Winter Storm Event Damage Totals, 1996-2018

JURISDICTION	PROPERTY & CROP LOSS	ANNUALIZED LOSS ESTIMATES
Chemung County	\$818,929	\$36,397

ASSESSMENT OF IMPACTS

The greatest risk from a winter storm hazard is to public health and safety. Potential impacts for the planning area may include:

- Vulnerable populations, particularly the elderly and infants, can face serious or life-threatening health problems from exposure to extreme cold including hypothermia and frostbite.
- Loss of electric power or other heat source can result in increased potential for fire injuries or hazardous gas inhalation because residents burn candles for light or use fires or generators to stay warm.
- Response personnel, including utility workers, public works personnel, debris removal staff, tow truck operators, and other first responders, are subject to injury or illness resulting from exposure to extreme cold temperatures.
- Response personnel would be required to travel in potentially hazardous conditions, elevating the life safety risk due to accidents and potential contact with downed power lines.
- Operations or service delivery may experience impacts from electricity blackouts due to winter storms.
- Power outages are possible throughout the planning area due to downed trees and power lines and/or rolling blackouts.
- Critical facilities without emergency backup power may not be operational during power outages.
- Emergency response and service operations may be impacted by limitations on access and mobility if roadways are closed, unsafe, or obstructed.
- Hazardous road conditions will likely lead to increases in automobile accidents, further straining emergency response capabilities.
- Depending on the severity and scale of damage caused by ice and snow events, damage to power transmission and distribution infrastructure can require days or weeks to repair.
- A winter storm event could lead to tree, shrub, and plant damage or death.
- Severe cold and ice could significantly damage agricultural crops.
- Schools may be forced to shut early due to treacherous driving conditions.
- Exposed water pipes may be damaged by severe or late season winter storms at both residential and commercial structures, causing significant damages.

The economic and financial impacts of winter weather on the community will depend on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by businesses and citizens will also contribute to the overall economic and financial conditions in the aftermath of a winter storm event.

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HAZARD DESCRIPTION

THUNDERSTORM WIND

Thunderstorms create extreme wind events which includes straight line winds. Wind is the horizontal motion of the air past a given point, beginning with differences in air pressures. Pressure that is higher at one place than another sets up a force pushing from the high toward the low pressure; the greater the difference in

SECTION 6: THUNDERSTORMS

pressures, the stronger the force. The distance between the area of high pressure and the area of low pressure also determines how fast the moving air is accelerated.

Thunderstorms are created when heat and moisture near the Earth's surface are transported to the upper levels of the atmosphere. By-products of this process are the clouds, precipitation, and wind that become the thunderstorm, and sub-hazards of thunderstorms are hail and lightning. While tornadoes can also be a sub-hazard of thunderstorms, they have been fully profiled separately in this plan (Section 8).



According to the National Weather Service (NWS), a thunderstorm occurs when thunder accompanies rainfall. Radar observers use the intensity of radar echoes to distinguish between rain showers and thunderstorms. Along with rolling thunder, lightning detection networks routinely track cloud-to-ground flashes to help track thunderstorms.

Straight line winds are responsible for most thunderstorm wind damages. One type of straight line wind, the downburst, is a small area of rapidly descending air beneath a thunderstorm. A downburst can cause damage equivalent to a strong tornado and make air travel extremely hazardous.

HAIL

Hailstorm events are a potentially damaging outgrowth of severe thunderstorms. During the developmental stages of a hailstorm, ice crystals form within a low pressure front due to the rapid rising of warm air into the upper atmosphere, and the subsequent cooling of the air mass. Frozen droplets gradually accumulate into ice crystals until they fall as precipitation that is round or irregularly shaped masses of ice typically greater than 0.75 inches in diameter. The size of hailstones is a direct result of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a by-product of heating on the Earth's surface. Higher temperature gradients above Earth's surface result in increased suspension time and hailstone size.

LIGHTNING

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes the thunder which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning often strikes outside of heavy rain and might occur as far as 10 miles away from any rainfall.

According to FEMA, an average of 300 people are injured and 80 people are killed in the United States each year by lightning. Direct lightning strikes also have the ability to cause significant damage to buildings, critical facilities, and infrastructure. Lightning is also responsible for igniting wildfires that can result in widespread damages to property before firefighters have the ability to contain and suppress the resultant fire.

LOCATION

Thunderstorm events, including thunderstorm wind, hail and lightning, can develop in any geographic location, and are considered a common occurrence in New York. Therefore a thunderstorm wind event could occur at any location within the Chemung County Planning Area, including all participating jurisdictions, as these storms develop randomly and are not confined to any geographic area within the planning area. It is assumed that the entire Chemung County Planning Area is uniformly exposed to the threat of thunderstorms winds.

EXTENT

THUNDERSTORM WIND

The extent or magnitude of a thunderstorm wind event is measured by the Beaufort Wind Scale. Table 6-1 describes the different intensities of wind in terms of speed and effects, from calm to violent and destructive.

Table 6-1. Beaufort Wind Scale¹

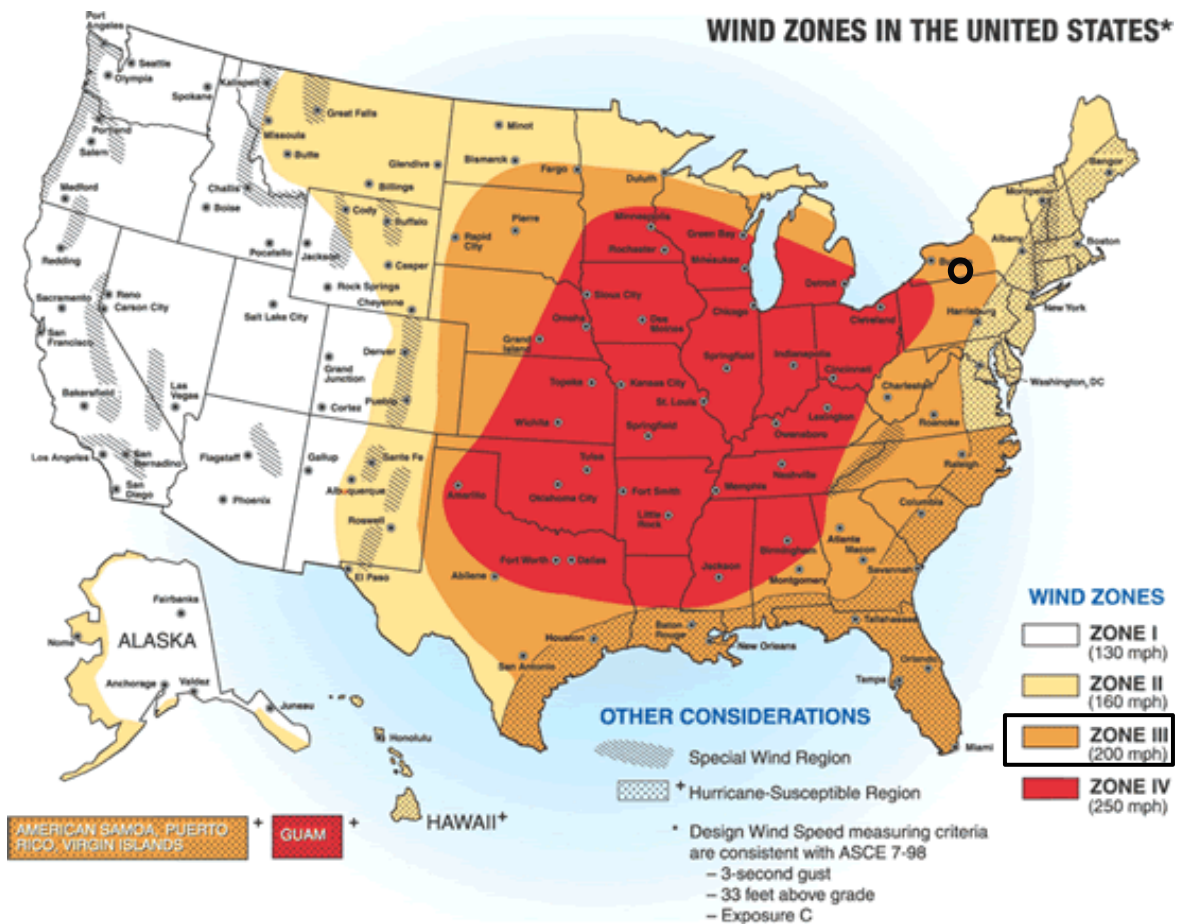
FORCE	WIND (MPH)	WMO CLASSIFICATION	APPEARANCE OF WIND EFFECTS
0	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-8	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	9-14	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	15-21	Moderate Breeze	Dust, leaves and loose paper lifted, small tree branches move
5	22-28	Fresh Breeze	Small trees in leaf begin to sway
6	29-31	Strong Breeze	Larger tree branches moving, whistling in wires
7	37-44	Near Gale	Whole trees moving, resistance felt walking against wind
8	45-53	Gale	Whole trees in motion, resistance felt walking against wind
9	54-62	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	63-72	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	74-83	Violent Storm	If experienced on land, widespread damage
12	84+	Hurricane	Violence and destruction

Figure 6-1 displays the wind zones as derived from NOAA.

¹ Source: World Meteorological Organization

SECTION 6: THUNDERSTORMS

Figure 6-1. Wind Zones in the United States²



HAIL

The National Weather Service (NWS) classifies a storm as “severe” if there is hail three-quarters of an inch in diameter (approximately the size of a penny) or greater, based on radar intensity or as seen by observers. The intensity category of a hailstorm depends on hail size and the potential damage it could cause, as depicted in the National Centers for Environmental Information (NCEI) Intensity Scale in Table 6-2.

Table 6-2. Hail Intensity and Magnitude³

SIZE CODE	INTENSITY CATEGORY	SIZE (Diameter Inches)	DESCRIPTIVE TERM	TYPICAL DAMAGE
H0	Hard Hail	Up to 0.33	Pea	No damage

² The Chemung County Planning Area is indicated by the circle.

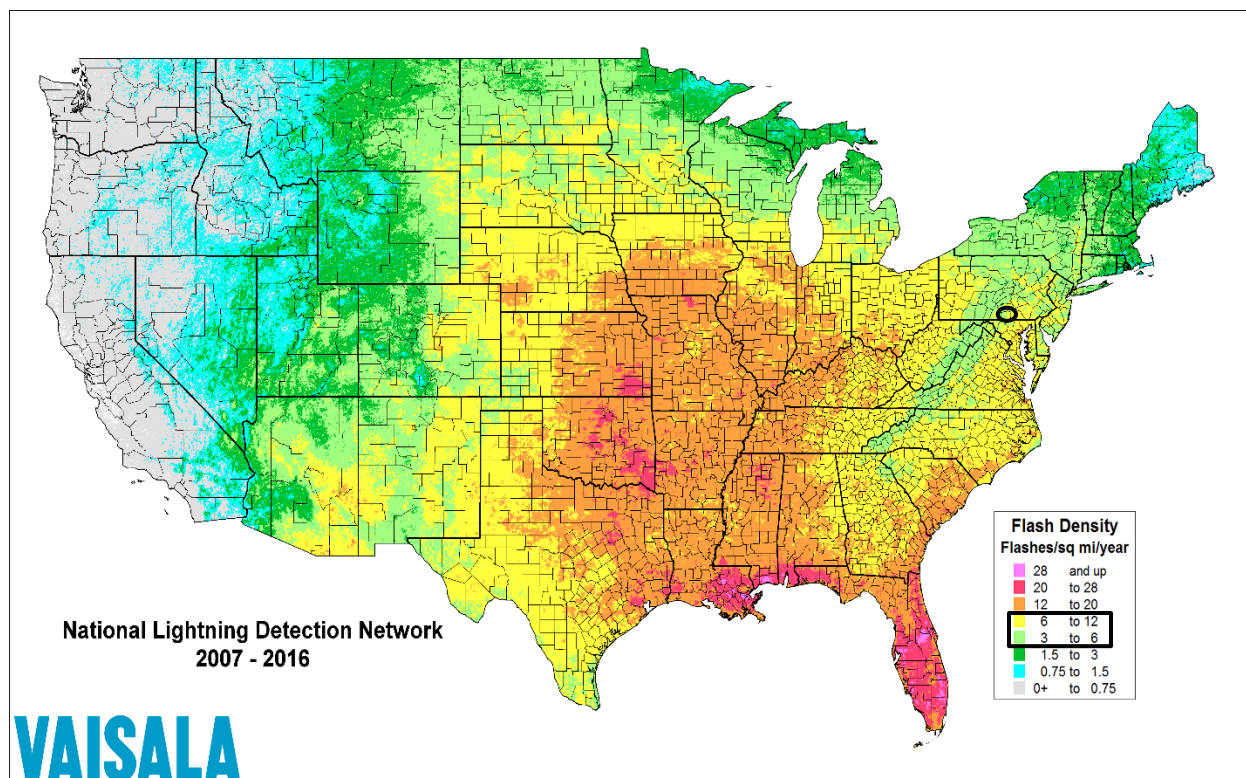
³ NCEI Intensity Scale, based on the TORRO Hailstorm Intensity Scale.

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SIZE CODE	INTENSITY CATEGORY	SIZE (Diameter Inches)	DESCRIPTIVE TERM	TYPICAL DAMAGE
H1	Potentially Damaging	0.33 – 0.60	Marble	Slight damage to plants and crops
H2	Potentially Damaging	0.60 – 0.80	Dime	Significant damage to plants and crops
H3	Severe	0.80 – 1.20	Nickel	Severe damage to plants and crops
H4	Severe	1.2 – 1.6	Quarter	Widespread glass and auto damage
H5	Destructive	1.6 – 2.0	Half Dollar	Widespread destruction of glass, roofs, and risk of injuries
H6	Destructive	2.0 – 2.4	Ping Pong Ball	Aircraft bodywork dented and brick walls pitted
H7	Very Destructive	2.4 – 3.0	Golf Ball	Severe roof damage and risk of serious injuries
H8	Very Destructive	3.0 – 3.5	Hen Egg	Severe damage to all structures
H9	Super Hailstorms	3.5 – 4.0	Tennis Ball	Extensive structural damage, could cause fatal injuries
H10	Super Hailstorms	4.0 +	Baseball	Extensive structural damage, could cause fatal injuries

LIGHTNING

According to NOAA, the average number of cloud-to-ground flashes for the State of New York between 2007 and 2016 was 3.1 flashes per square mile. Vaisala's U.S. National Lightning Detection Network lightning flash density map (Figure 6-2) shows a range of three to twelve cloud-to-ground lightning flashes per square mile per year for the entire Chemung County Planning Area. The black circle indicates the Chemung County Planning Area on Figure 6-2. This rate equates to approximately 1,233 to 4,932 flashes per year for the entire planning area.

Figure 6-2. Lightning Flash Density, 2007-2016

The extent for lightning can be expressed in terms of the number of strikes in an interval. NOAA utilizes lightning activity levels (LALs) on a scale from 1-6. LAL rankings reflect the frequency of cloud-to-ground lightning either forecast or observed (Table 6-3).

Table 6-3. NOAA Lightning Activity Levels (LAL)

LAL	CLOUD & STORM DEVELOPMENT	LIGHTNING STRIKES/ 15 MIN
1	No thunderstorms.	-
2	Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lightning is frequent.	16-25

SECTION 6: THUNDERSTORMS

LAL	CLOUD & STORM DEVELOPMENT	LIGHTNING STRIKES/ 15 MIN
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense.	>25
6	Similar to LAL 3 except thunderstorms are dry.	

SUMMARY

THUNDERSTORM WIND

On average, the planning area experiences two to three thunderstorm events every year. The County is located in Zone III, meaning they can experience winds up to 200 mph. Chemung County, including all participating jurisdictions, has experienced a significant wind event or an event with winds in the range of “Force 12” on the Beaufort Wind Scale with winds above 84 mph. This is the most significant event that can be expected in the future for all participating jurisdictions.

HAIL

The intensity scale in Table 6-2 ranges from H0 to H5, with increments of intensity or damage potential in relation to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind. Based on available data regarding the previous occurrences for the area, the Chemung County Planning Area, including all participating jurisdictions, may experience hailstorms ranging from an H0 to an H5. The planning area can mitigate a storm from low risk or hard hail to a potentially damaging hailstorm with half dollar sized hail that leads to widespread destruction of glass, roofs, and potential risk of injuries.

LIGHTNING

The NCEI does not include the LAL for historical lightning events, therefore in order to determine the extent of lightning strikes, the yearly average range of estimated number of lightning strikes within the planning area (1,233 to 4,932 flashes) and a cloud-to-ground flash density of three to twelve per square mile were divided by the number⁴ of thunderstorm events that occur annually in the planning area. Flash density is reported as a range of cloud-to-ground strikes at a county-wide level. The Chemung County Planning Area, including all participating jurisdictions, should expect an average range of 1 to 5 lightning strikes within 15 minutes at any given time during a lightning or combined lightning and thunderstorm event, indicating lightning strikes have an average LAL range of 1-2. An LAL of 2 can be anticipated in the future for all participating jurisdictions.

⁴ Analysis includes the highest number of events recorded in a given year during the reporting period in order to account for typical under reporting of thunderstorm and lightning events.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Tables 6-4, 6-5, and 6-6 depict historical occurrences of thunderstorm wind events for the Chemung County Planning Area according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 135 thunderstorm wind events are known to have impacted the Chemung County Planning Area, including all participating jurisdictions, based upon NCEI records. Table 6-6 presents information on known historical events impacting the Chemung County-wide Planning Area with resulting damages or injuries.

The NCEI is a national data source organized under the National Oceanic and Atmospheric Administration. The NCEI is the largest archive available for climate data; however, it is important to note that the only incidents recorded are those that are reported to the NCEI that have been factored into this risk assessment. In the tables that follow throughout this section, some occurrences seem to appear multiple times in one table. This is due to reports from various locations throughout the planning area. In addition, property damage estimates are not always available. Where an estimate has been provided in a table for losses, the dollar amounts have been altered to indicate the damage in 2018 dollars.

Historical thunderstorm wind data are provided on a county-wide basis below and within a City-wide basis per the NCEI database in Annex A-N.

Table 6-4. Historical Thunderstorm Wind Events with Reported Damages, 1955-2018⁵

MAXIMUM WIND SPEED RECORDED (MPH)	NUMBER OF REPORTED EVENTS
0-30	44
31-40	0
41-50	0
51-60	64
61-70	14
71-80	2
81-90	2
91-100	0
Unknown	9

⁵ Damages are reported from January 1955 through June 2018.

SECTION 6: THUNDERSTORMS

Table 6-5. Historical Thunderstorm Wind Events, 1955-2018⁶⁷

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City & Town of Elmira	8/24/1993	3:00 PM	0	0	0	\$86,874	\$0
City & Town of Elmira	8/24/1993	3:55 PM	0	0	0	\$86,874	\$0
Town of Veteran	6/13/1994	2:30 PM	0	0	0	\$8,500	\$0
City & Town of Elmira	7/6/1994	2:45 PM	0	0	0	\$8,477	\$0
Town of Catlin	7/15/1994	5:20 PM	0	0	0	\$8,477	\$0
Chemung County	7/6/1995	1:45 PM	0	0	0	\$3,300	\$0
Chemung County	7/6/1995	2:00 PM	0	0	0	\$4,949	\$0
Chemung County	7/6/1995	2:00 PM	0	0	0	\$4,949	\$0
Town of Catlin	7/6/1995	1:45 PM	0	0	0	\$3,300	\$0
City & Town of Elmira	7/6/1995	2:10 PM	0	0	0	\$6,599	\$0
Town of Erin	7/6/1995	2:40 PM	0	0	0	\$4,949	\$0
Horseheads	7/6/1995	2:40 PM	0	0	0	\$4,949	\$0
Town of Van Etten	7/6/1995	2:40 PM	0	0	0	\$4,949	\$0
Town of Big Flats	4/30/1996	11:28 AM	Unknown	0	0	\$4,829	\$0
City & Town of Elmira	5/10/1996	6:00 PM	Unknown	0	0	\$40,164	\$0
Town of Erin	5/29/1998	2:05 PM	Unknown	0	0	\$61,815	\$0
Town & Village of Horseheads	5/31/1998	2:35 PM	Unknown	0	0	\$15,454	\$0
Town & Village of Horseheads	5/31/1998	6:22 PM	Unknown	0	0	\$7,727	\$0
Town & Village of Horseheads	6/30/1998	2:25 PM	Unknown	0	0	\$69,457	\$0
Town & Village of Horseheads	9/27/1998	12:45 PM	Unknown	0	0	\$107,648	\$0
Chemung County	7/9/1999	8:15 PM	Unknown	0	0	\$15,092	\$0
Town of Chemung	6/2/2000	1:30 PM	60	0	1	\$1	\$0

⁶ Damages are reported from January 1955 through June 2018.

⁷ Only recorded events with fatalities, injuries or damages are listed. Magnitude is listed when available. Damage values are in 2018 dollars.

SECTION 6: THUNDERSTORMS

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Erin	6/26/2002	6:55 PM	58	0	0	\$4,195	\$0
Town of Big Flats	6/27/2002	2:45 PM	63	0	4	\$69,924	\$0
Town of Big Flats	7/21/2003	3:45 PM	71	0	0	\$41,042	\$0
Town of Big Flats	6/6/2005	11:05 AM	69	0	0	\$64,679	\$0
City & Town of Elmira	6/10/2005	4:15 PM	58	0	0	\$6,468	\$0
City & Town of Elmira	7/26/2005	6:40 PM	58	0	0	\$2,575	\$0
City & Town of Elmira	6/22/2006	8:10 PM	58	0	0	\$30,999	\$0
Town & Village of Horseheads	7/28/2006	12:20 PM	58	0	0	\$1,236	\$0
City & Town of Elmira	8/3/2006	1:05 PM	58	0	0	\$1,234	\$0
Village of Millport	11/16/2006	2:30 PM	58	0	0	\$1,249	\$0
Town of Southport	11/16/2006	2:50 PM	58	0	0	\$3,746	\$0
Town of Van Etten	11/16/2006	2:50 PM	58	0	0	\$6,243	\$0
Town of Big Flats	7/8/2007	6:25 PM	58	0	0	\$2,416	\$0
Town of Chemung	8/17/2007	7:00 PM	58	0	0	\$1,210	\$0
Town & Village of Horseheads	8/17/2007	6:40 PM	58	0	0	\$2,420	\$0
City & Town of Elmira	9/26/2007	4:35 PM	58	0	0	\$1,207	\$0
Town of Chemung	5/16/2009	3:50 PM	81	0	0	\$23,529	\$0
Town of Big Flats	6/25/2009	3:45 PM	58	0	0	\$1,166	\$0
Town of Catlin	6/25/2009	3:45 PM	58	0	0	\$3,499	\$0
Town & Village of Horseheads	6/25/2009	3:45 PM	58	0	0	\$3,499	\$0
Town of Big Flats	4/27/2011	7:13 PM	58	0	0	\$5,593	\$0
Town of Ashland	5/26/2011	7:25 PM	58	0	0	\$11,134	\$0
Town of Ashland	5/26/2011	7:59 PM	58	0	0	\$5,567	\$0
City & Town of Elmira	5/26/2011	3:50 PM	58	0	0	\$5,567	\$0
City & Town of Elmira	5/26/2011	3:55 PM	58	0	0	\$11,134	\$0
City & Town of Elmira	5/26/2011	4:04 PM	58	0	0	\$5,567	\$0

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JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City & Town of Elmira	5/26/2011	7:28 PM	58	0	0	\$22,268	\$0
Town & Village of Horseheads	5/26/2011	4:01 PM	58	0	0	\$7,794	\$0
Town of Southport	5/26/2011	3:50 PM	58	0	0	\$5,567	\$0
Village of Wellsburg	5/26/2011	7:25 PM	58	0	0	\$16,701	\$0
Village of Wellsburg	5/26/2011	7:25 PM	58	0	0	\$16,701	\$0
Town of Southport	5/27/2011	6:30 PM	58	0	0	\$55,670	\$0
Town of Chemung	8/19/2011	1:50 PM	58	0	0	\$3,332	\$0
Village of Millport	8/19/2011	2:15 PM	58	0	0	\$3,332	\$0
Town of Erin	5/29/2012	1:45 PM	58	0	0	\$2,189	\$0
Town & Village of Horseheads	7/7/2012	10:35 AM	58	0	0	\$10,981	\$0
Village of Millport	7/7/2012	10:21 AM	58	0	0	\$5,491	\$0
City & Town of Elmira	7/26/2012	3:02 PM	58	0	0	\$5,491	\$0
City & Town of Elmira	9/6/2012	3:12 PM	58	0	0	\$1,087	\$0
Town & Village of Horseheads	9/6/2012	3:25 PM	58	0	0	\$2,174	\$0
Town of Big Flats	6/24/2013	2:45 PM	58	0	0	\$5,387	\$0
Town & Village of Horseheads	6/24/2013	1:00 PM	58	0	0	\$5,387	\$0
Town & Village of Horseheads	6/24/2013	3:03 PM	58	0	0	\$5,387	\$0
Village of Elmira Heights	6/30/2013	5:30 PM	58	0	0	\$5,387	\$0
City & Town of Elmira	7/18/2013	3:40 PM	58	0	0	\$5,385	\$0
Town of Erin	7/13/2014	4:25 PM	58	0	0	\$10,560	\$0
Town & Village of Horseheads	7/23/2014	3:10 PM	58	0	0	\$10,560	\$0
Town & Village of Horseheads	7/23/2014	3:15 PM	58	0	0	\$5,280	\$0
Town of Southport	6/23/2015	6:30 AM	58	0	0	\$3,163	\$0
City & Town of Elmira	7/25/2016	2:05 PM	58	0	0	\$3,137	\$0
Town & Village of Horseheads	7/25/2016	1:45 PM	58	0	0	\$5,228	\$0
City & Town of Elmira	4/16/2017	2:40 PM	58	0	0	\$1,029	\$0

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JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City & Town of Elmira	5/1/2017	6:01 PM	58	0	0	\$10,280	\$0
City & Town of Elmira	5/1/2017	5:57 PM	69	0	0	\$10,280	\$0
Town of Big Flats	5/3/2018	2:10 PM	63	0	0	\$50,000	\$0

Table 6-6. Summary of Historical Thunderstorm Wind Events, 1955-2018⁸

JURISDICTION	NUMBER OF EVENTS	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Chemung County	46	86	0	0	\$28,290	\$0
Town of Ashland	2	58	0	0	\$16,701	\$0
Town of Baldwin	0	0	0	0	\$0	\$0
Town of Big Flats	11	71	0	4	\$245,036	\$0
Town of Catlin	3	58	0	0	\$15,276	\$0
Town of Chemung	6	81	0	1	\$28,071	\$0
City & Town of Elmira ⁹	24	69	0	0	\$352,696	\$0
Village of Elmira Heights	1	58	0	0	\$5,387	\$0
Town of Erin	5	58	0	0	\$83,708	\$0
Town & Village of Horseheads ¹⁰	23	69	0	0	\$265,181	\$0
Village of Millport	3	58	0	0	\$10,072	\$0
Town of Southport	6	58	0	0	\$68,146	\$0
Town of Van Etten	2	58	0	0	\$11,192	\$0
Town of Veteran	1	0	0	0	\$8,500	\$0
Village of Wellsburg	2	58	0	0	\$33,402	\$0
TOTAL LOSSES	135	(Max Extent)	0	5	\$1,171,658	

⁸ Damages are reported from January 1955 through June 2018.

⁹ City and Town of Elmira are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

¹⁰ Town and Village of Horseheads are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

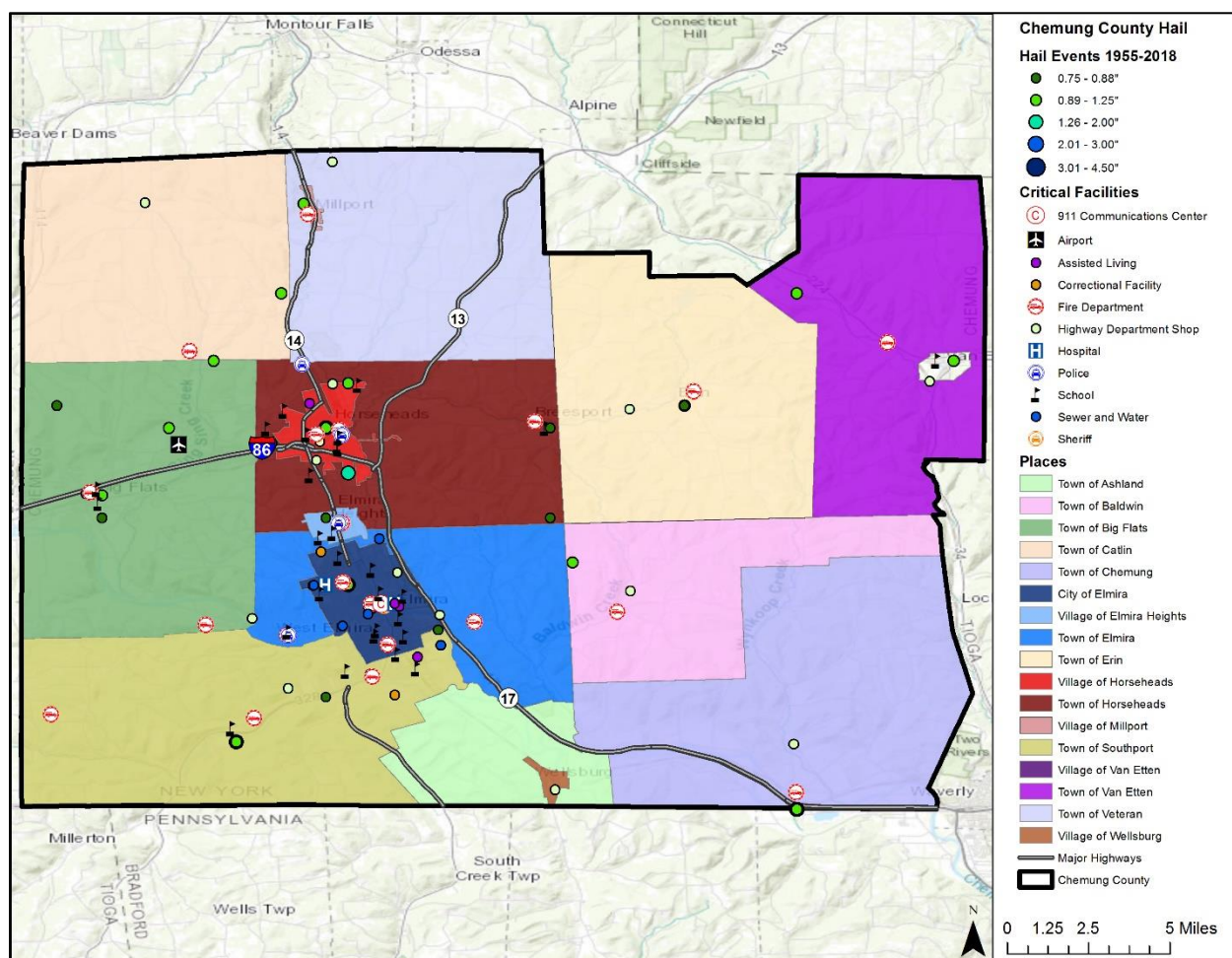
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Based on the list of historical thunderstorm wind events for the Chemung County Planning Area (listed above), including all participating jurisdictions, 22 events have occurred since the 2012 Plan.

HAIL

Historical evidence shown in Figure 6-3 demonstrates that the Chemung County Planning Area is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Historical events with reported damages (2018 dollars), injuries, or fatalities are shown in Table 6-7. A total of 62 reported historical hail events impacted the Chemung County Planning Area between January 1955 and June 2018 (Summary Table 6-8). These events were reported to NCEI and NOAA databases and may not represent all hail events to have occurred during the past 64 years. Only those events for the Chemung County Planning Area with latitude and longitude available were plotted (Figure 6-3). Historical hail events are provided on a county-wide basis below and within a City-wide basis per the NCEI database in Annexes A-N.

Figure 6-3. Spatial Historical Hail Events, 1955-2018



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Table 6-7. Historical Hail Events, 1955-2018¹¹

JURISDICTION	Date	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Elmira Heights	5/31/1998	1.5 inches	0	0	\$46,361	\$0
Town of Southport	5/26/2011	1 inches	0	0	\$5,567	\$0
Town & Village of Horseheads	9/6/2012	1.25 inches	0	0	\$1,087	\$0
Town & Village of Horseheads	9/6/2012	1.5 inches	0	0	\$16,308	\$0
City & Town of Elmira	9/6/2012	1.75 inches	0	0	\$10,872	\$0
Town & Village of Horseheads	9/6/2012	1.75 inches	0	0	\$21,744	\$0
City & Town of Elmira	6/12/2015	1 inches	0	0	\$3,163	\$0
City & Town of Elmira	6/5/2017	1 inches	0	0	\$1,027	\$0

Table 6-8. Historical Hail Events Summary, 1955-2018¹²

JURISDICTION	NUMBER OF EVENTS	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Chemung County	8	1.75 inches	0	0	\$0	\$0
Town of Ashland	0	N/A	0	0	N/A	N/A
Town of Baldwin	0	N/A	0	0	N/A	N/A
Town of Big Flats	3	1.0 inch	0	0	\$0	\$0
Town of Catlin	2	1.0 inch	0	0	\$0	\$0
Town of Chemung	3	1.75 inches	0	0	\$0	\$0
City & Town of Elmira ¹³	12	1.75 inches	0	0	\$15,062	\$0
Village of Elmira Heights	2	1.5 inches	0	0	\$46,361	\$0
Town of Erin	4	1.0 inch	0	0	\$0	\$0

¹¹ Damages are reported from January 1955 through June 2018.

¹² Damages are reported from January 1955 through June 2018.

¹³ City and Town of Elmira are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

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JURISDICTION	NUMBER OF EVENTS	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Town & Village of Horseheads ¹⁴	19	1.75 inches	0	0	\$39,140	\$0
Village of Millport	1	1.25 inches	0	0	\$0	\$0
Town of Southport	5	1.0 inch	0	0	\$5,567	\$0
Town of Van Etten	3	1.0 inch	0	0	\$0	\$0
Town of Veteran	0	N/A	0	0	N/A	N/A
Village of Wellsburg	0	N/A	0	0	N/A	N/A
TOTAL LOSSES		(Max Extent)	0	0	\$106,130	

Based on the list of historical hail events for the Chemung County Planning Area (listed above), including all participating jurisdictions, 20 events have occurred since the 2012 Plan.

LIGHTNING

Table 6-9 depicts historical occurrences of lightning for the Chemung County Planning Area, including all participating jurisdictions, with associated damages according to the National Centers for Environmental Information (NCEI) data. Since January 1996, only three recorded lightning events are known to have impacted the Planning Area, based upon NCEI records. It is highly likely additional lightning occurrences have gone unreported before and during the recording period.

The NCEI is a national data source organized under the National Oceanic and Atmospheric Administration. The NCEI is the largest archive available for climate data; however, it is important to note that the only incidents factored into this risk assessment are those that are reported to the NCEI for the entire Chemung County Planning Area. Damage estimates provided in a table for losses have been modified to reflect the damage in 2018 dollars.

Table 6-9. Historical Lightning Events with Reported Damages, 1955-2018¹⁵

JURISDICTION	DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Veteran	7/6/1999	5:35 PM	0	0	\$22,638	\$0
Town of Chemung	9/4/2001	8:08 AM	0	1	\$0	\$0
Town of Big Flats	6/6/2005	11:00 AM	0	0	\$64,676	\$0

¹⁴Town and Village of Horseheads are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

¹⁵ Damage values are in 2018 dollars. Damages are reported from January 1955 through June 2018. Lightning events are only rarely reported as independent events.

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JURISDICTION	DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
TOTAL LOSSES			0	1	\$87,314	

Based on the list of historical lightning events for the Chemung County Planning Area, including all participating jurisdictions, none of the reported events occurred since the 2012 Plan.

SIGNIFICANT EVENTS

June 2, 2000 – Chemung County

Fire and rescue personnel reported 1 inch diameter hail in Waverly. Also, thunderstorm winds knocked a tree onto a car on Route 407, slightly injuring the driver and trapping her in the vehicle for 30 minutes.

June 27, 2002- Town of Big Flats

Strong thunderstorm winds took down a tree on church Street in Elmira. The snapped off 6 feet from the ground. The tree landed on a car parked in a driveway. Four people in the station wagon suffered only minor scrapes from glass when the tree landed on the rear of the car. Musical equipment in the back was smashed. In Big Flats it took down several large trees along Route 352. Some of the trees took down utility lines. A large produce stand was flipped. 2100 customers lost power in Chemung County and adjacent Steuben County.

June 6, 2005- Town of Big Flats, City & Town of Elmira, Town & Village Horseheads, Town of Southport

Thunderstorm winds downed trees and wires in Big Flats, Horseheads, Elmira, and Southport. A tree fell onto a house in Big Flats. Also in Big Flats a trailer was blown off its foundation.

PROBABILITY OF FUTURE EVENTS

THUNDERSTORM WIND

Most thunderstorm winds occur during the months of March, April, May, and September. Based on available records of historic events, there have been 135 events in a 63 year reporting period, which provides a probability of occurrence of two to three events every year. Even though the intensity of thunderstorm wind events is not always damaging for the Chemung County Planning Area, the frequency of occurrence for a thunderstorm wind event is highly likely. This means that an event is probable within the next year for the Chemung County Planning Area, including all participating jurisdictions.

HAIL

Based on available records of historic events, 62 events in a 63 year reporting period for the Chemung County Planning Area provides a probability of one event every year. This frequency supports a highly likely probability of future events for the Chemung County Planning Area, including all participating jurisdictions.

LIGHTNING

Based on historical records and input from the planning team the probability of occurrence for future lightning events in the Chemung County Planning Area, including all participating jurisdictions, is considered highly likely, or an event probable in the next year. The planning team stated that lightning occurs regularly in the area. According to NOAA, the Chemung County Planning Area is located in an area of the country

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that experiences three to twelve lightning flashes per square mile per year (approximately 1,233 to 4,932 flashes per year). Given this estimated probability, it can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the planning area, including all participating jurisdictions.

VULNERABILITY AND IMPACT

Vulnerability is difficult to evaluate since thunderstorm (including wind, hail, and lightning) events can occur at different strength levels, in random locations, and can create relatively narrow paths of destruction. Due to the randomness of these events, all existing and future structures and facilities in the Chemung County Planning Area could potentially be impacted and remain vulnerable to possible injury and property loss from thunderstorm winds.

Trees, power lines and poles, signage, manufactured housing, radio towers, concrete block walls, storage barns, windows, garbage receptacles, brick facades, and vehicles, unless reinforced, are vulnerable to thunderstorm events. More severe damage involves windborne debris; in some instances, patio furniture and other lawn items have been reported to have been blown around by wind and, very commonly, debris from damaged structures in turn have caused damage to other buildings not directly impacted by the event. In numerous instances roofs have been reported as having been torn off of buildings. Portable buildings typically used at commercial properties and schools would be more vulnerable to thunderstorm events than typical site built structures and could potentially pose a greater risk for wind-blown debris.

The US Census data indicates a total of 2,206 manufactured homes (approximately 5.0%) located in the Chemung County Planning Area, including all participating jurisdictions (Table 6-10). In addition, 84.1% (approximately 36,849 structures) of the residential structures in the Chemung County Planning Area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table 6-10. Structures at Greater Risk by Jurisdiction

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Chemung County (Totals)	2,206	36,849
Town of Ashland	278	476
Town of Baldwin	172	281
Town of Big Flats	211	2,386
Town of Catlin	244	622
Town of Chemung	223	736
City of Elmira	20	11,517
Town of Elmira	0	2,778
Village of Elmira Heights	0	1,610
Town of Erin	293	493

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JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Horseheads	177	6,940
Village of Horseheads	24	2,550
Village of Millport	41	176
Town of Southport	85	4,447
Town of Van Etten	192	469
Town of Veteran	188	1,159
Village of Wellsburg	58	209

The following critical facilities (Table 6-11) would be vulnerable to thunderstorm wind events in each participating jurisdiction:

Table 6-11. Critical Facilities at Risk by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Chemung County	1 911 Communications Center, 1 Airport, 3 Correctional Facilities, 21 Fire Stations, 17 Highway Department Shops, 2 Hospitals, 5 Assisted Living Facilities, 6 Police Stations, 30 Schools, 6 Water/Wastewater Facilities
Town of Ashland	1 Highway Department Shop
Town of Baldwin	1 Fire Station, 1 Highway Department Shop
Town of Big Flats	1 Airport, 2 Fire Stations, 1 Highway Department Shop, 1 Schools
Town of Catlin	1 Fire Station, 1 Highway Department Shop
Town of Chemung	1 Fire Station, 1 Highway Department Shop
City of Elmira	1 911 Communication Center, 2 Correctional Facilities, 3 Fire Stations, 1 Highway Department Shop, 2 Hospitals, 2 Assisted Living Facilities, 2 Police Stations, 11 Schools, 4 Water/Wastewater Facilities
Town of Elmira	2 Fire Stations, 3 Highway Department Shop, 1 Police Station, 6 Schools, 1 Water/Wastewater Facility
Village of Elmira Heights	1 Fire Station, 1 Highway Department Shop, 1 Police Station, 3 Schools
Town of Erin	1 Fire Station, 1 Highway Department Shop
Town of Horseheads	1 Fire Station, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Police Station, 4 Schools
Village of Horseheads	2 Fire Stations, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Police Station, 4 Schools
Village of Millport	1 Fire Station
Town of Southport	1 Correctional Facility, 3 Fire Stations, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Water/Wastewater Facility
Town of Van Etten	1 Fire Station, 1 Highway Department Shop, 1 School

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JURISDICTION	CRITICAL FACILITIES
Town of Veteran	1 Fire Station, 1 Highway Department Shop
Village of Wellsburg	1 Highway Department Shop

A thunderstorm events can also result in traffic disruptions, injuries and in rare cases, fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Chemung County Planning Area has resulted in six injuries and no fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Chemung County Planning Area, including all participating jurisdictions, would be “Limited,” with minor quality of life lost, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$1,365,102 having an approximate annual loss estimate of \$21,498 (Table 6-12).

Table 6-12. Potential Annualized Losses for the Chemung County Planning Area

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Chemung County	\$28,290	\$446
Town of Ashland	\$16,701	\$263
Town of Baldwin	\$0	\$0
Town of Big Flats	\$309,712	\$4,877
Town of Catlin	\$15,276	\$241
Town of Chemung	\$28,071	\$442
City and Town of Elmira ¹⁶	\$367,758	\$5,791
Village of Elmira Heights	\$51,748	\$815
Town of Erin	\$83,708	\$1,318
Town and Village of Horseheads ¹⁷	\$304,321	\$4,792
Village of Millport	\$10,072	\$159
Town of Southport	\$73,713	\$1,161
Town of Van Etten	\$11,192	\$176
Town of Veteran	\$31,138	\$490

¹⁶ City and Town of Elmira are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

¹⁷ Town and Village of Horseheads are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

SECTION 6: THUNDERSTORMS

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Wellsburg	\$33,402	\$526
Planning Area Totals	\$1,365,102	\$21,498

ASSESSMENT OF IMPACTS

Thunderstorm wind events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. Impacts to the planning area can include:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Individuals exposed to the storm can be directly struck by lightning, posing significant health risks and potential death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Hail may create hazardous road conditions during and immediately following an event, delaying first responders from providing for or preserving public health and safety.
- Large hail events will likely cause extensive roof damage to residential structures along with siding damage and broken windows, creating a spike in insurance claims and a rise in premiums.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- During exceptionally heavy wind events, first responders may be prevented from responding to calls, as the winds may reach a speed in which their vehicles and equipment are unsafe to operate.
- Thunderstorm events often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage often results in an increase in structure fires and carbon monoxide poisoning, as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.
- Lightning strikes can be associated with structure fires and wildfires, creating additional risk to residents and first responders.
- First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications.
- Critical staff may be unable to report for duty, limiting response capabilities.
- City or county departments may be damaged, delaying response and recovery efforts for the entire community.
- Private sector entities that the County and all participating jurisdictions and their residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.

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- Some businesses not directly damaged by thunderstorm wind events may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Older structures built to less stringent building codes may suffer greater damage as they are typically more vulnerable to thunderstorm winds.
- Large scale wind events can have significant economic impact on the affected area, as it must now fund expenses such as infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damages without a backup power source.
- A large thunderstorm event could impact recreational activities at places like Marsh Lake and Park Station Campground, placing visitors in imminent danger, potentially requiring emergency services or evacuation.
- Recreational areas and parks may be damaged or inaccessible due to downed trees or debris, causing temporary impacts to area businesses.

The economic and financial impacts of thunderstorm winds on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any thunderstorm wind event.

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HAZARD DESCRIPTION

Floods generally result from excessive precipitation. The severity of a flood event is determined by a combination of several major factors, including: stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surface. Typically, floods are long-term events that may last for several days. Chemung County is in the headwaters where floods, especially flash floods, do not typically last more than a day.

The primary types of general flooding are inland and coastal flooding. Due to the Chemung County Planning Area's inland location, only inland flooding is profiled in this section. Inland or riverine flooding is a result of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Inland or riverine flooding is overbank flooding of rivers and streams, typically resulting from large-scale weather systems that generate prolonged rainfall over a wide geographic area, thus it is a naturally occurring and inevitable event. Some river floods occur seasonally when winter or spring rainfalls fill river basins with too much water, too quickly. Torrential rains from decaying hurricanes or tropical systems can also produce riverine flooding.

LOCATION

The Flood Insurance Rate Map (FIRM) data provided by FEMA for the Chemung County Planning Area shows the following flood hazard areas:

- Zone A: Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance requirements and floodplain management standards apply.

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- Zone AE: Areas subject to inundation by 1-percent-annual-chance shallow flooding. It is the base floodplain where base flood elevations are provided. AE zones are now used on new format FIRMs instead of A1-30 zones.
- Zone AO: Areas subject to 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet.
- Zone X: Moderate risk areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by a levee. No BFEs or base flood depths are shown within these zones.

Flood zone delineations with elevations are available in the following participating municipalities: Town of Ashland, Town of Big Flats, Town of Chemung, City of Elmira, Town of Elmira, Village of Elmira Heights, Town of Horseheads, Village of Horseheads, Town of Southport, and the Village of Wellsburg. The remaining participating jurisdictions have limited flood hazard boundary maps where base flood elevations have not been determined including: Town of Baldwin, Town of Catlin, Town of Erin, Village of Millport, Town of Van Etten, and the Town of Veteran. The limited studies for the Town of Van Etten and the Town of Veteran indicate No Special Flood Hazard Areas. It should be noted that Chemung County does not have any unincorporated areas and is therefore not noted in the mapping narrative.

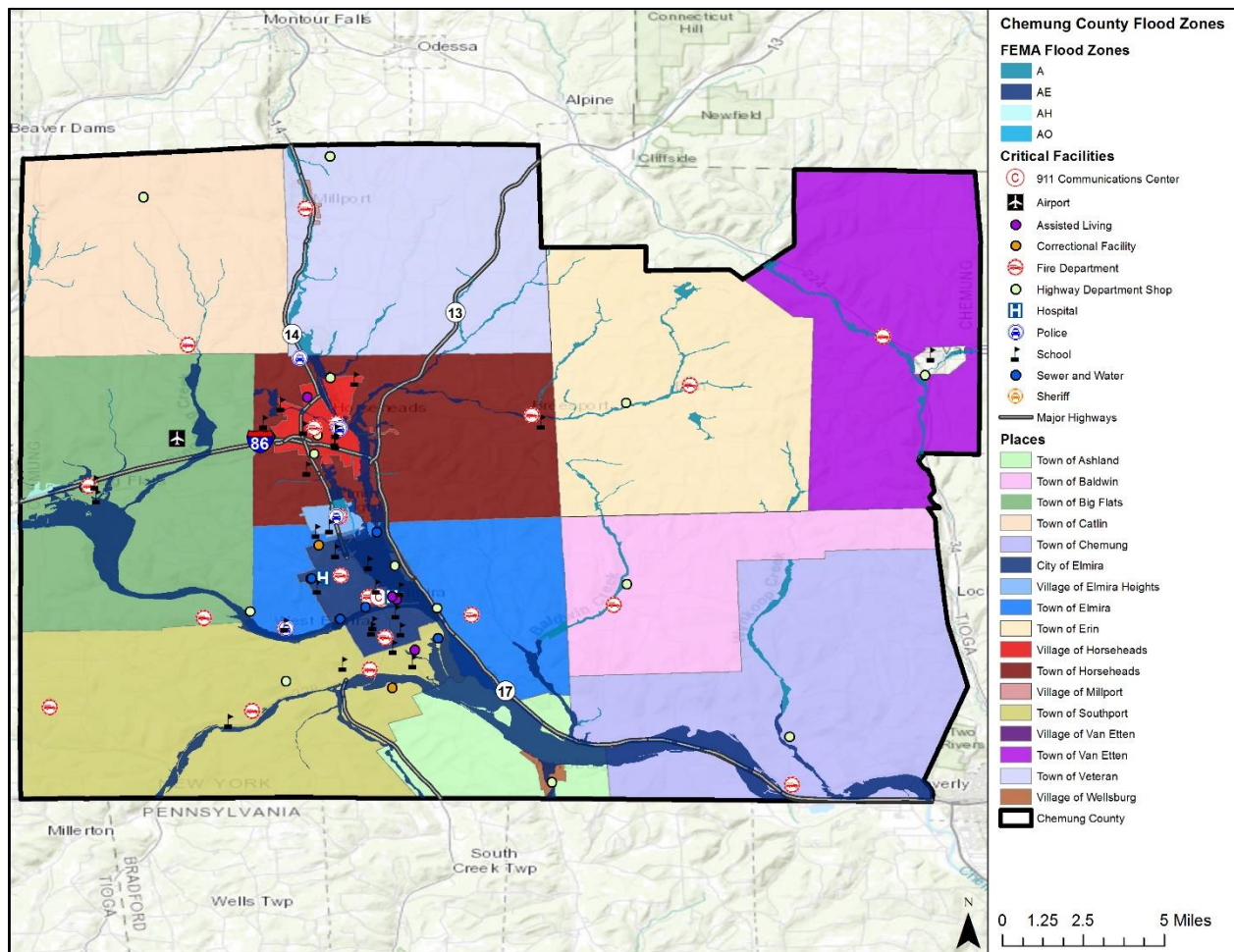
In addition to the delineated flood areas, there are some areas that are subject to flooding that are not captured on maps. The potential for riverine flooding from many of the County's streams was not evaluated when the Flood Insurance Study and Flood Insurance Rate Maps were prepared. Yet these streams have floodplains, many of which pose serious flood hazards. Because there is no floodplain designated on the FIRMs, development along these streams has not been regulated by the local laws for flood damage prevention. Therefore, development in these areas is at risk from both flooding and streambank erosion. Localized flooding is also caused by drainage problems and debris accumulation in streams or ditches. Hundreds of homes and businesses are located in areas outside of regulated floodplains that may be subject to flooding, drainage problems, or scour.

In order to enhance future risk assessments and improve floodplain management for participating jurisdictions, any mapping data deficiency has been addressed with mitigation actions (Section 12) specifically developed to identify and fully study, flood hazard areas throughout the planning area where mapping is inadequate or outdated.

Locations of estimated flood zones for all participating jurisdictions, based on the available Flood Insurance Rate Maps (FIRM) from FEMA are illustrated in Figures 7-1 to 7-17.

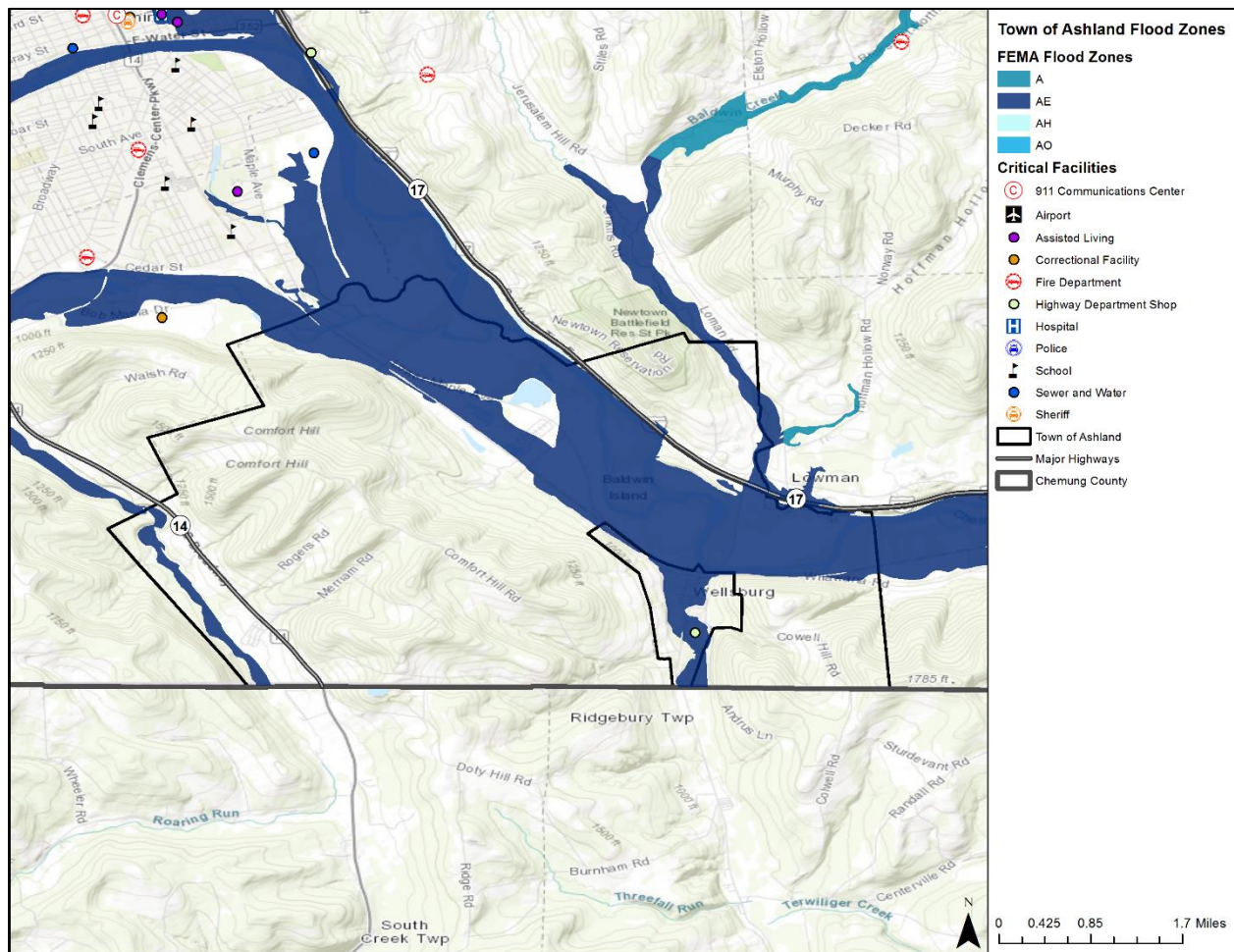
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Figure 7-1. Estimated Flood Zones in Chemung County



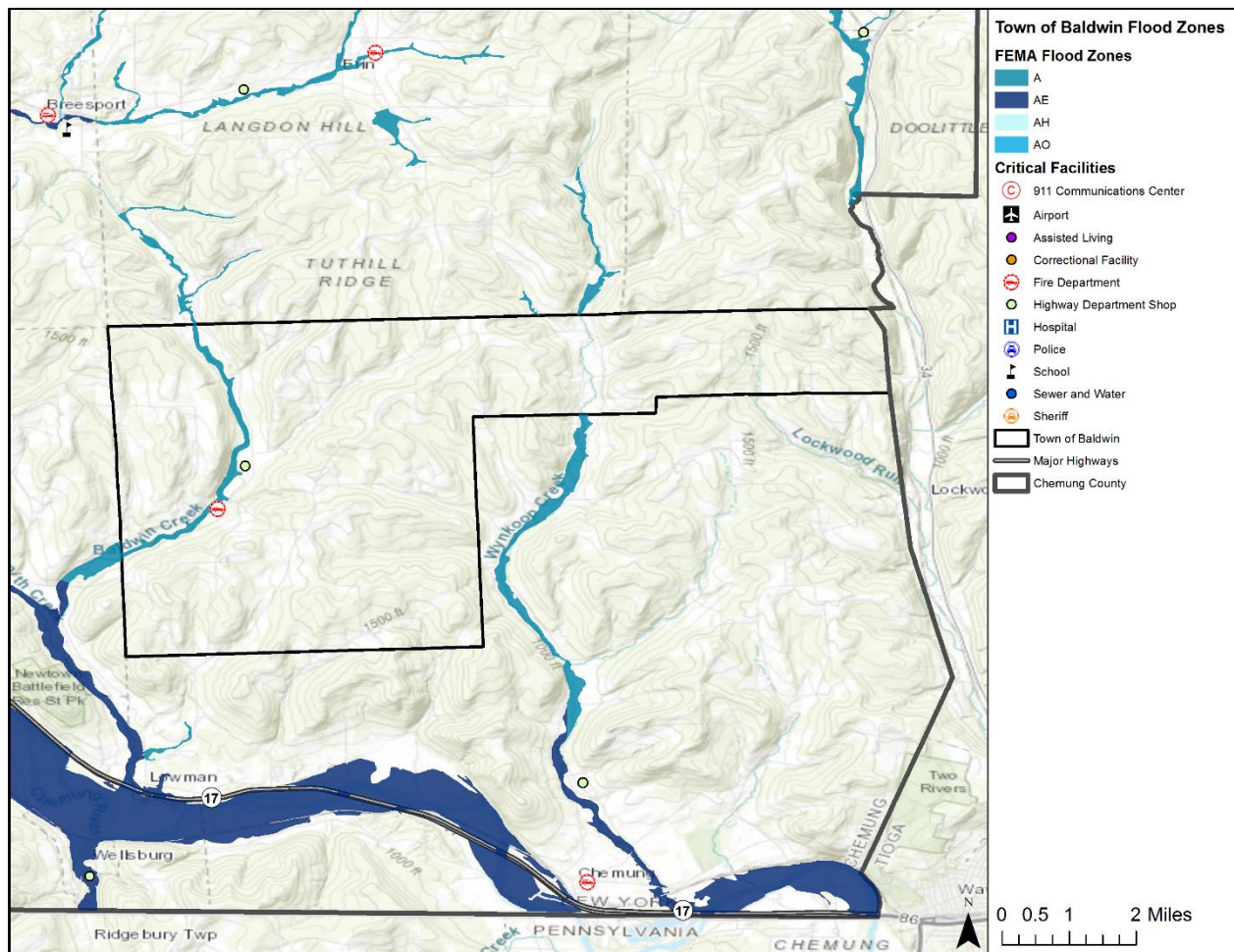
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Figure 7-2. Estimated Flood Zones in the Town of Ashland



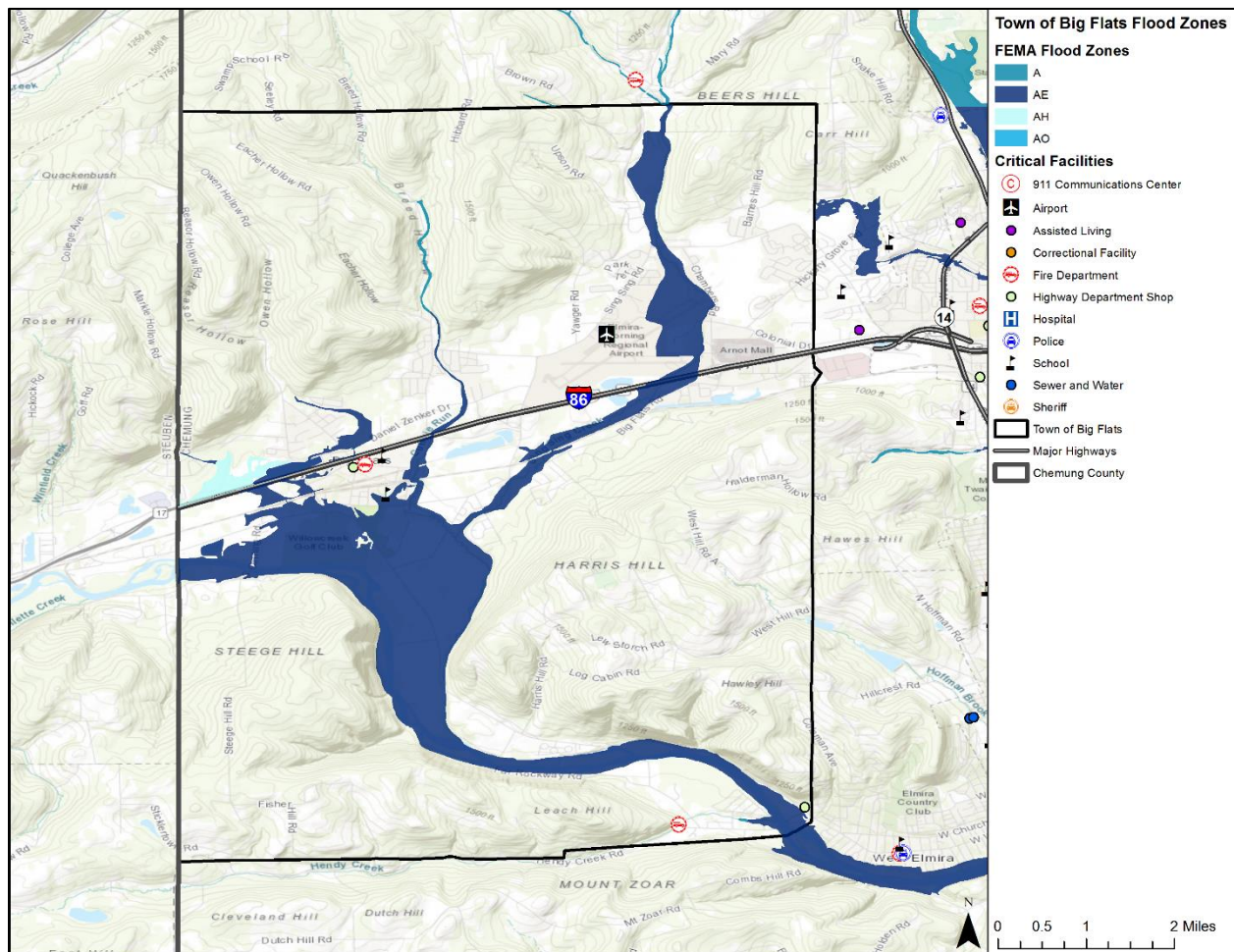
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Figure 7-3. Estimated Flood Zones in the Town of Baldwin



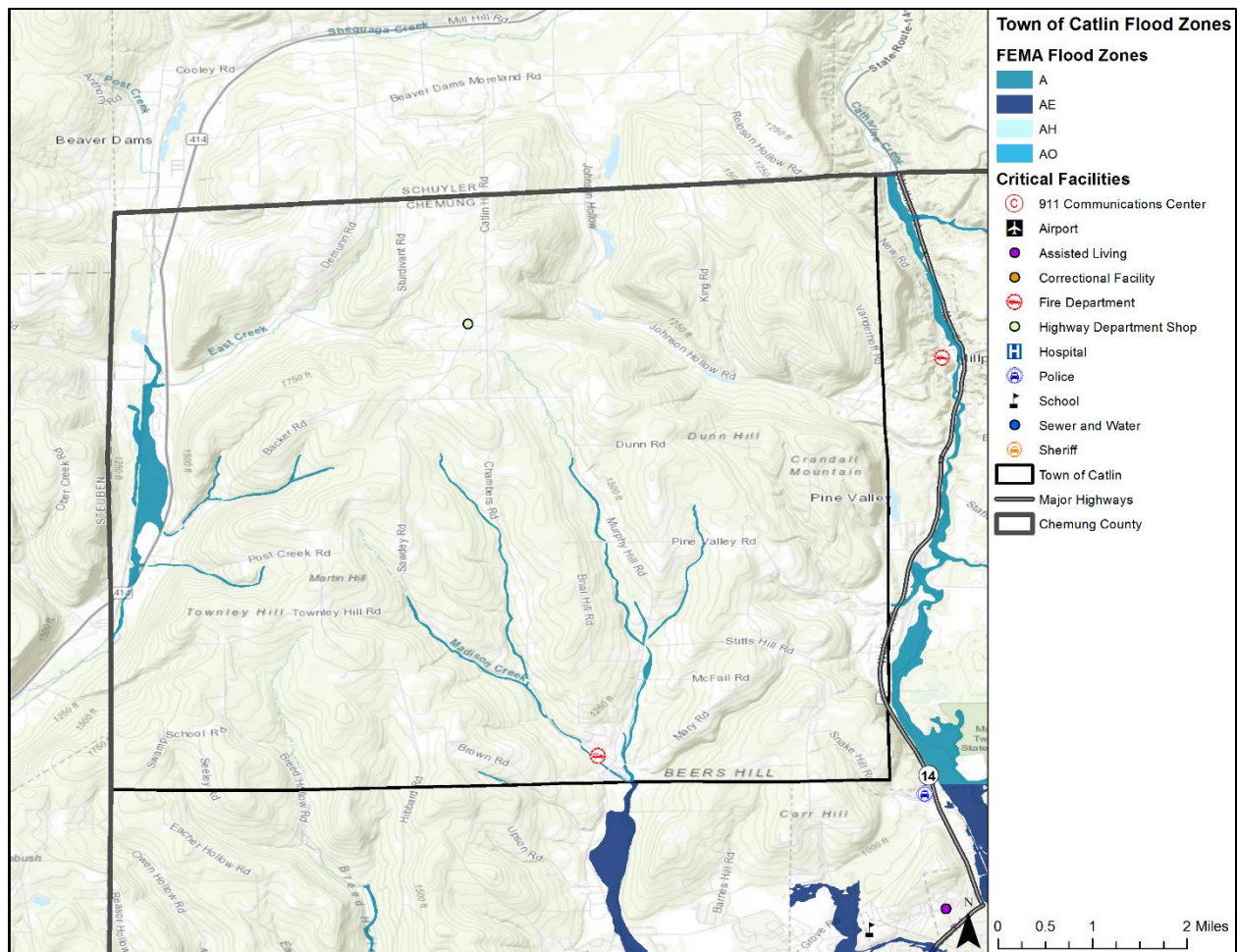
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Figure 7-4. Estimated Flood Zones in the Town of Big Flats



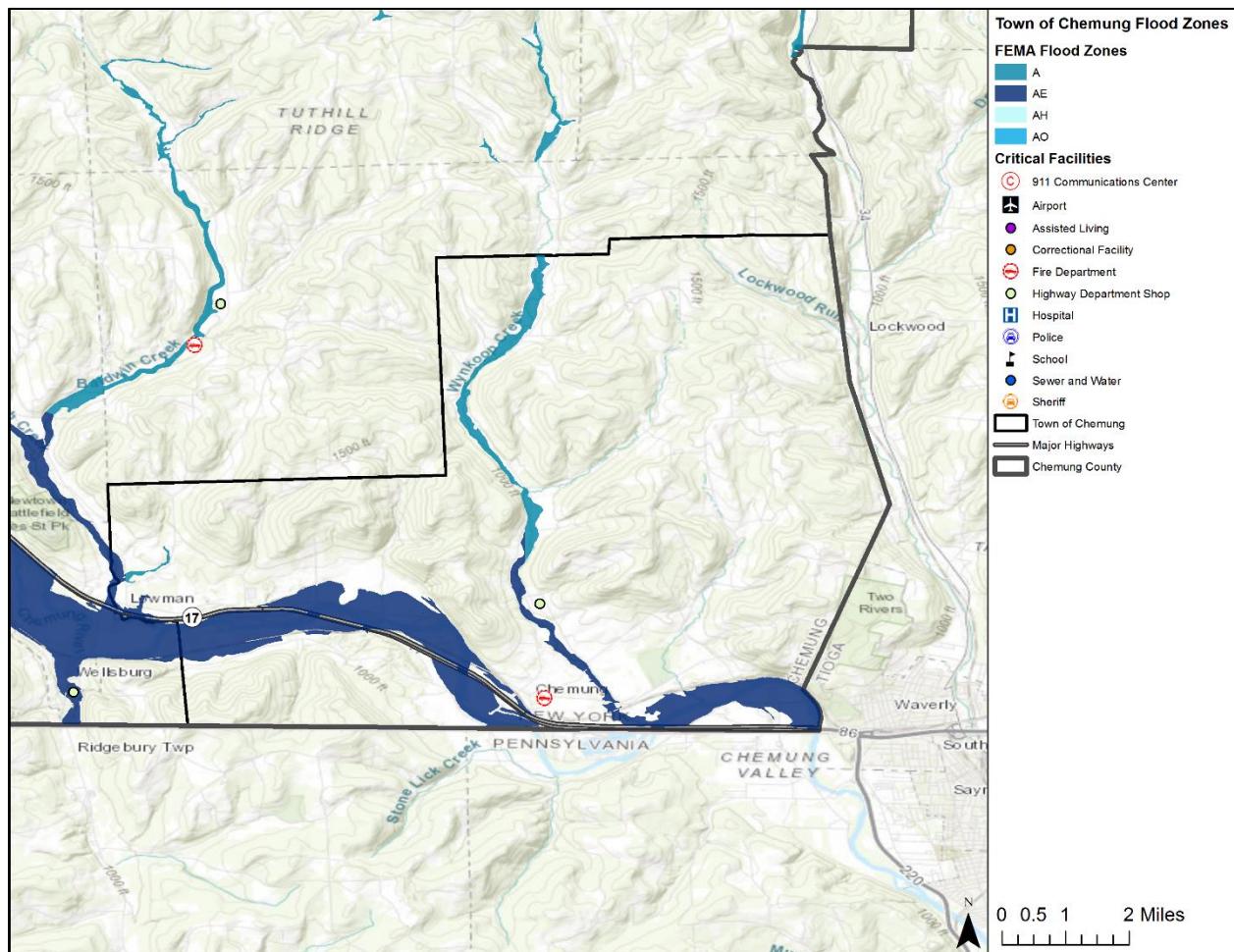
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Figure 7-5. Estimated Flood Zones in the Town of Catlin



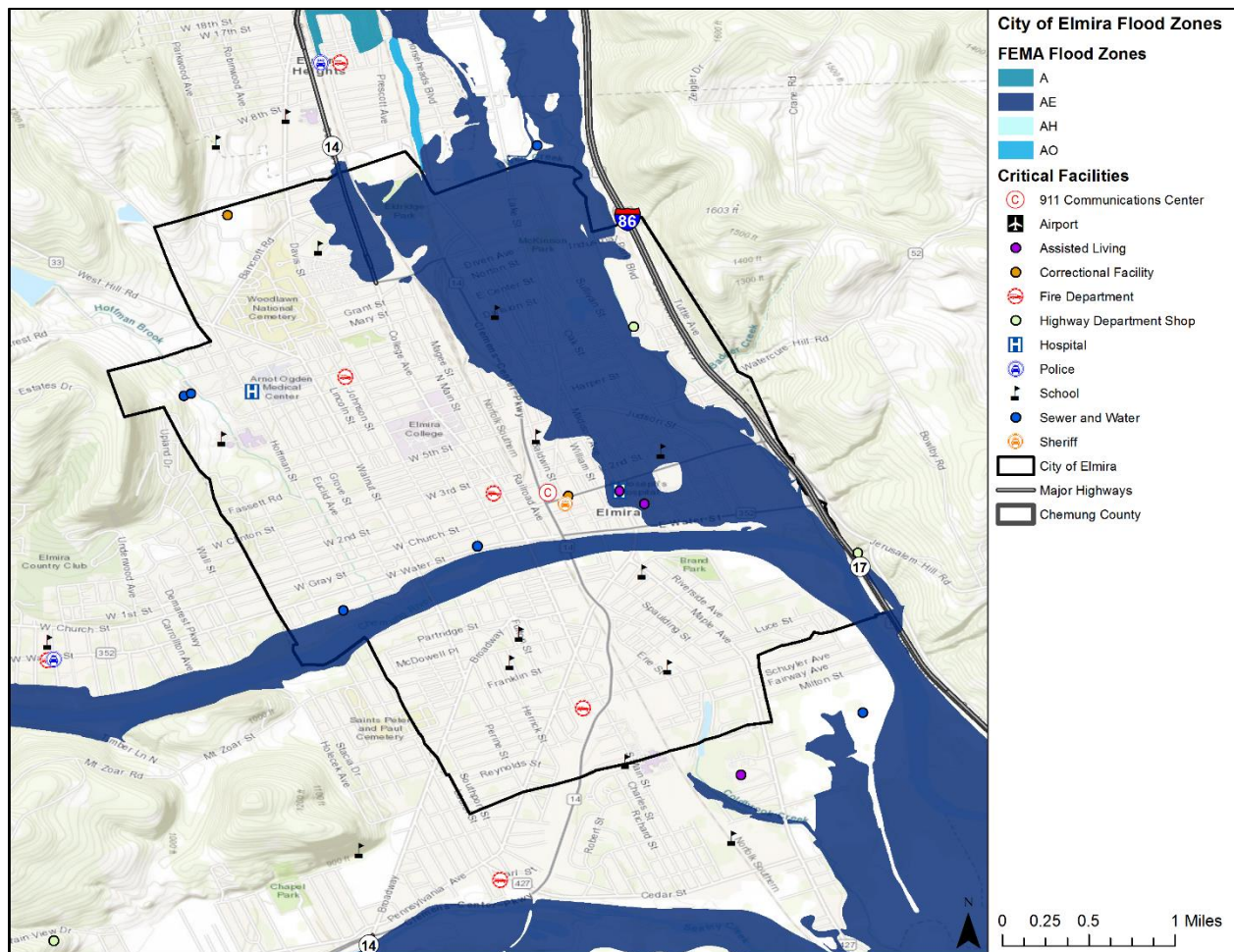
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Figure 7-6. Estimated Flood Zones in the Town of Chemung



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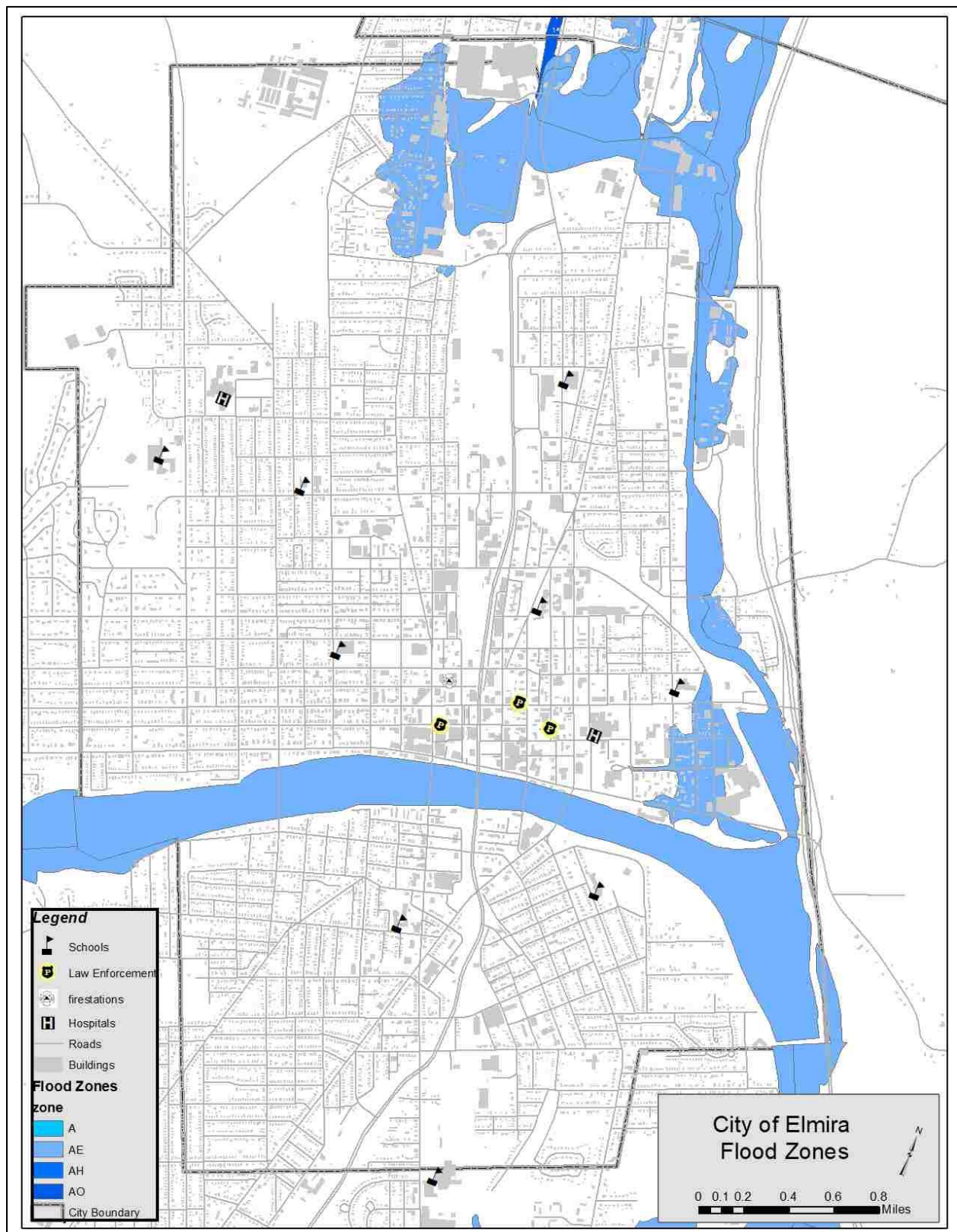
Figure 7-7. Estimated Flood Zones in the City of Elmira



The City of Elmira has recently digitized their flood maps with updated data. The preliminary digitized map is included below (Figure 7-8), Once the updated flood mapping data is reviewed and approved by FEMA, the revised digitized maps will become the effective DFIRMS for the City of Elmira.

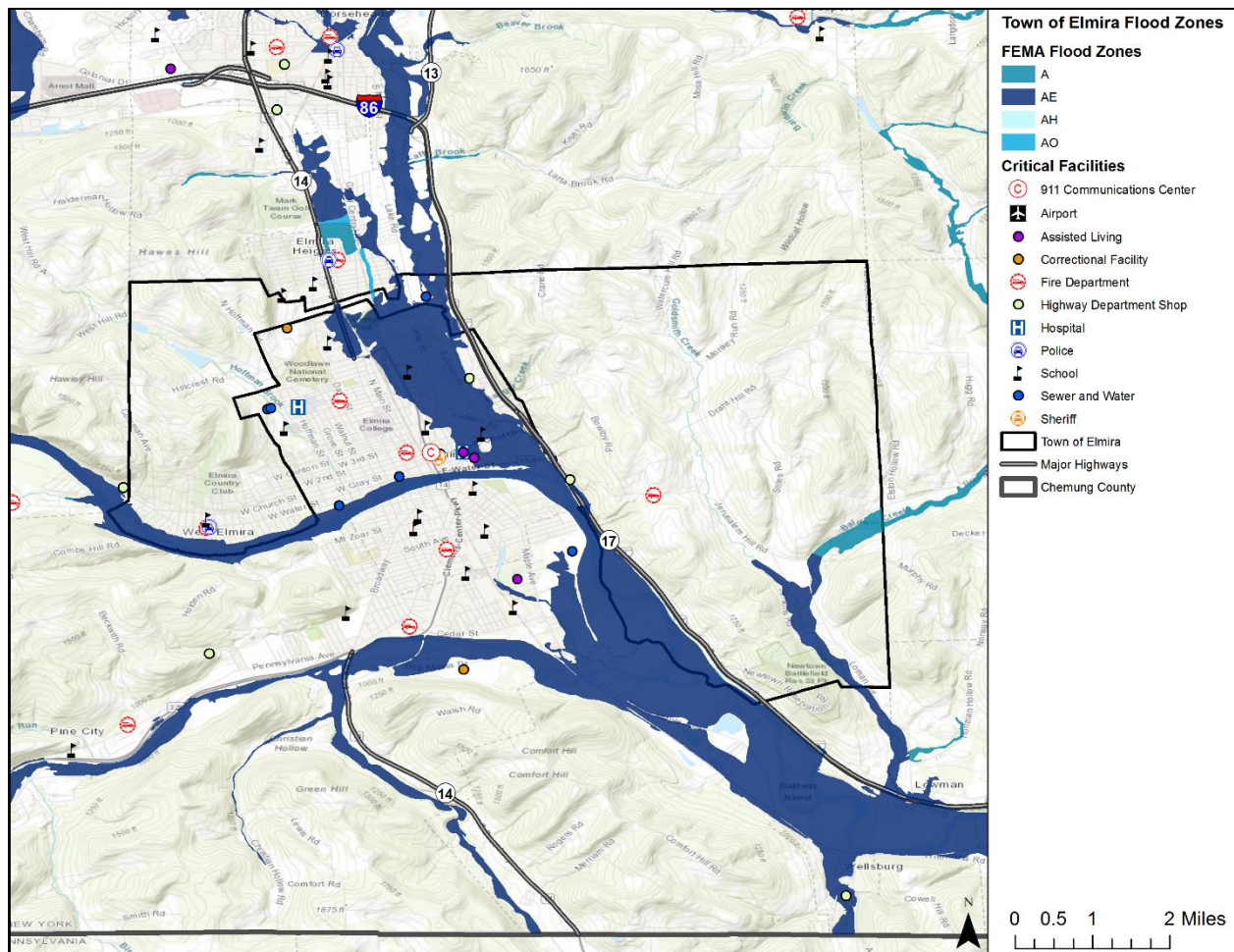
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Figure 7-8. Revised Preliminary Flood Zones in the City of Elmira



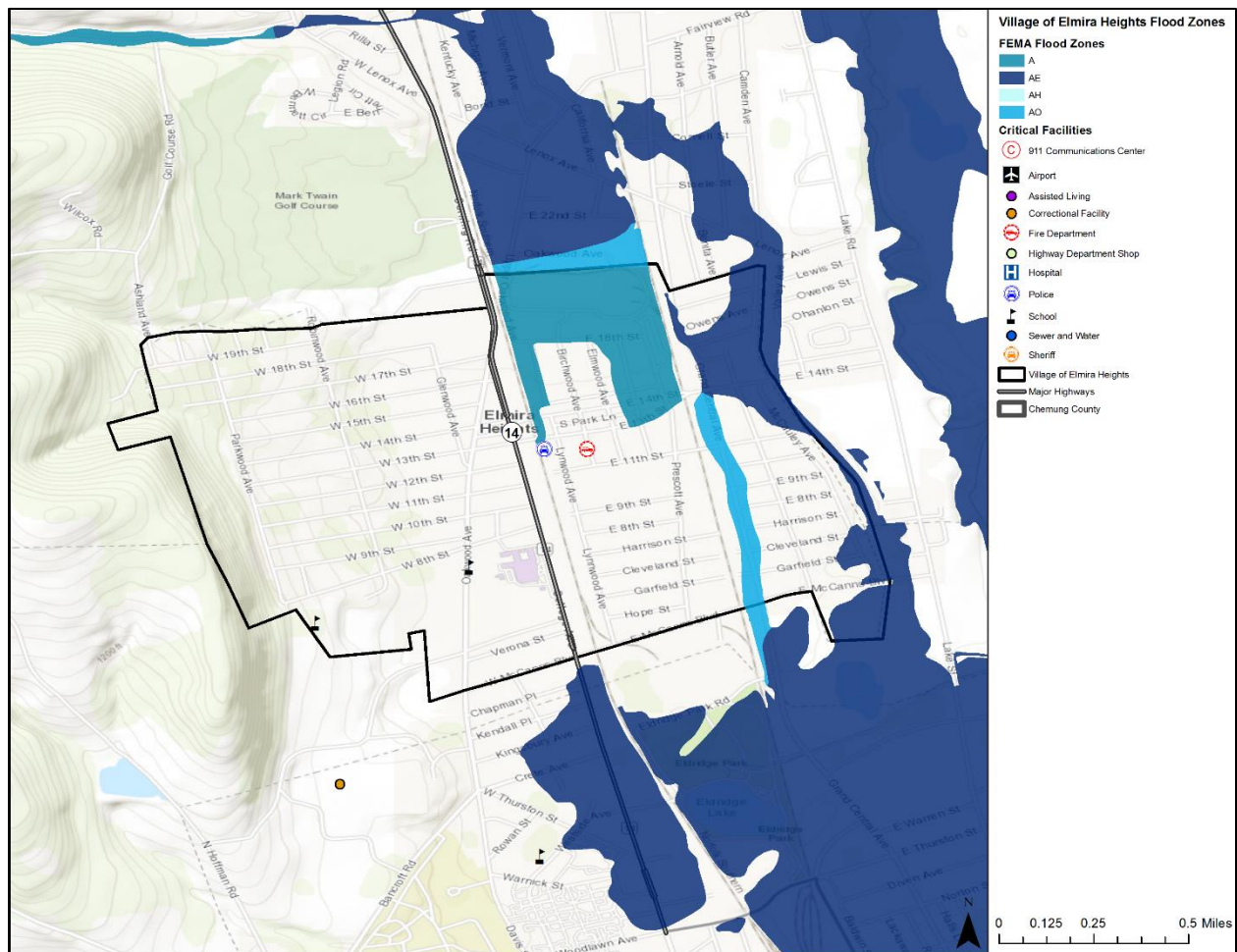
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Figure 7-8. Estimated Flood Zones in the Town of Elmira



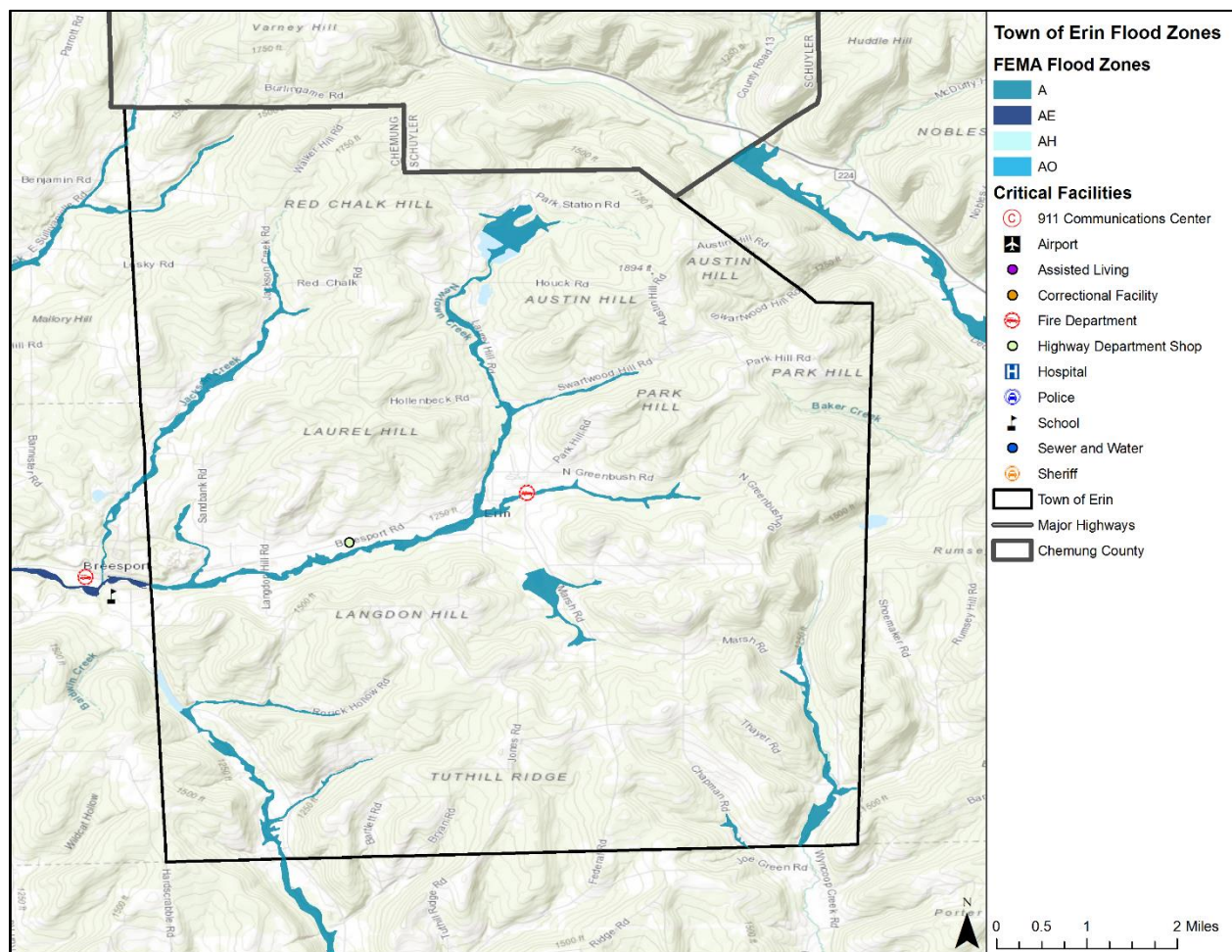
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Figure 7-9. Estimated Flood Zones in the Village of Elmira Heights



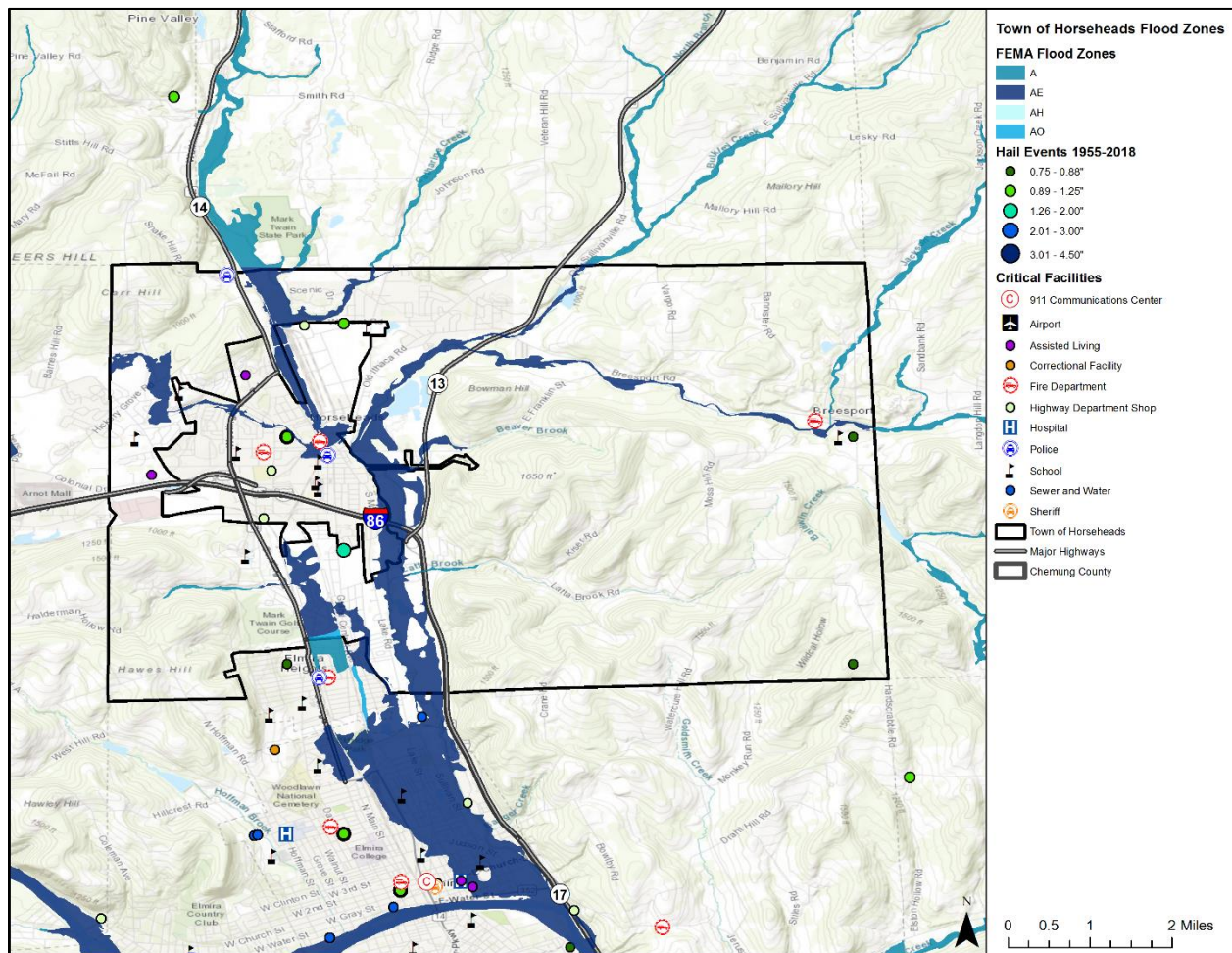
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Figure 7-10. Estimated Flood Zones in the Town of Erin



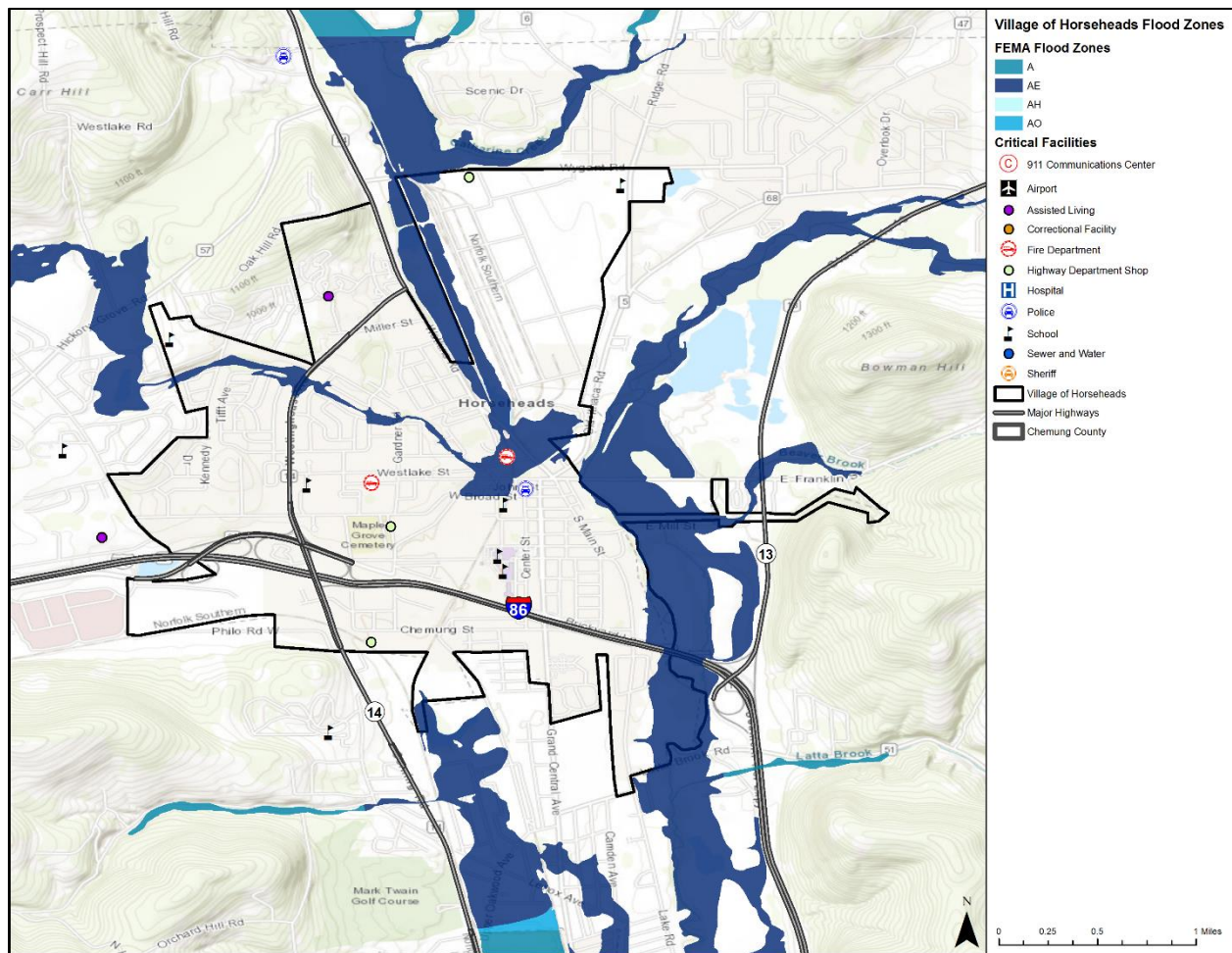
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Figure 7-11. Estimated Flood Zones in the Town of Horseheads



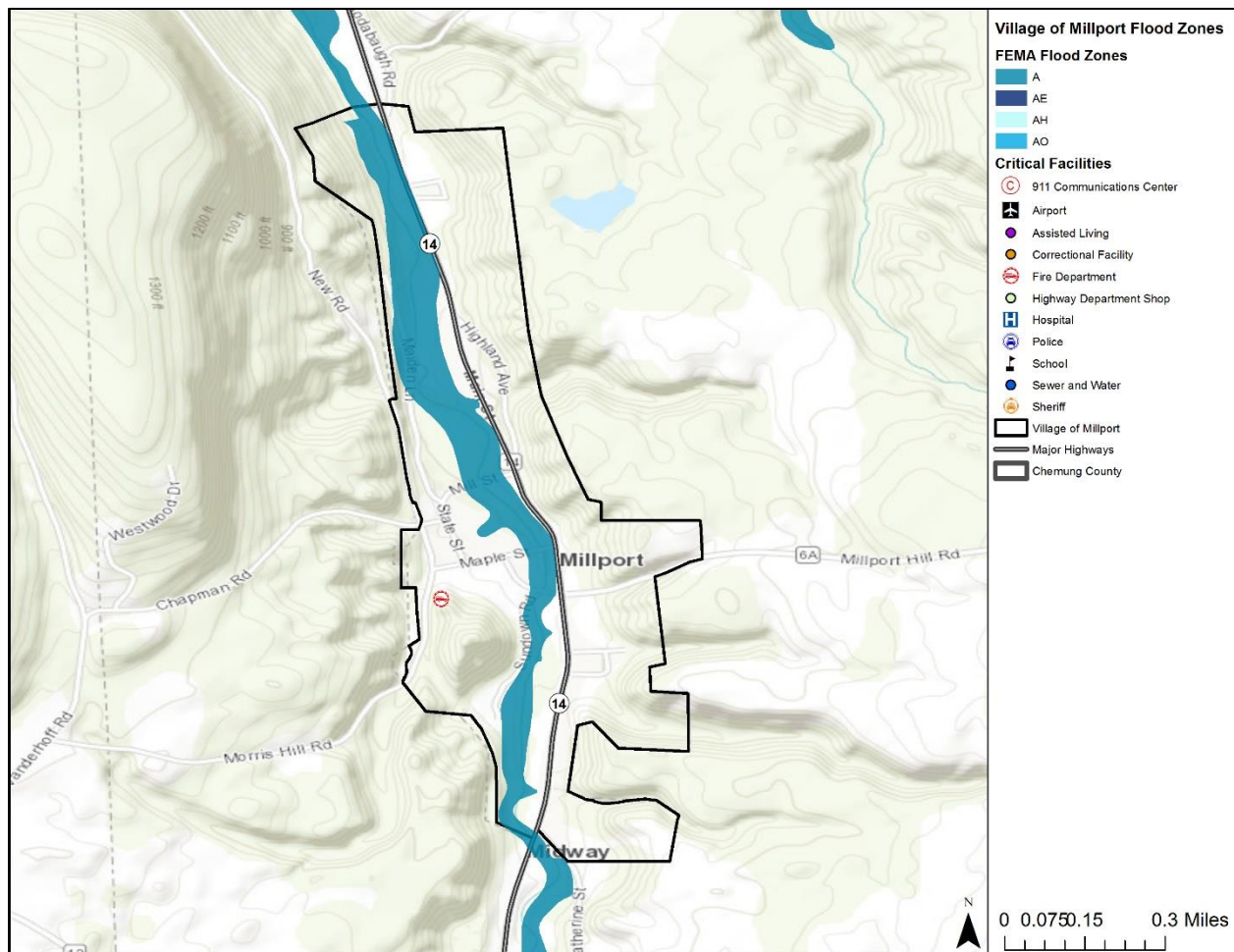
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Figure 7-12. Estimated Flood Zones in the Village of Horseheads



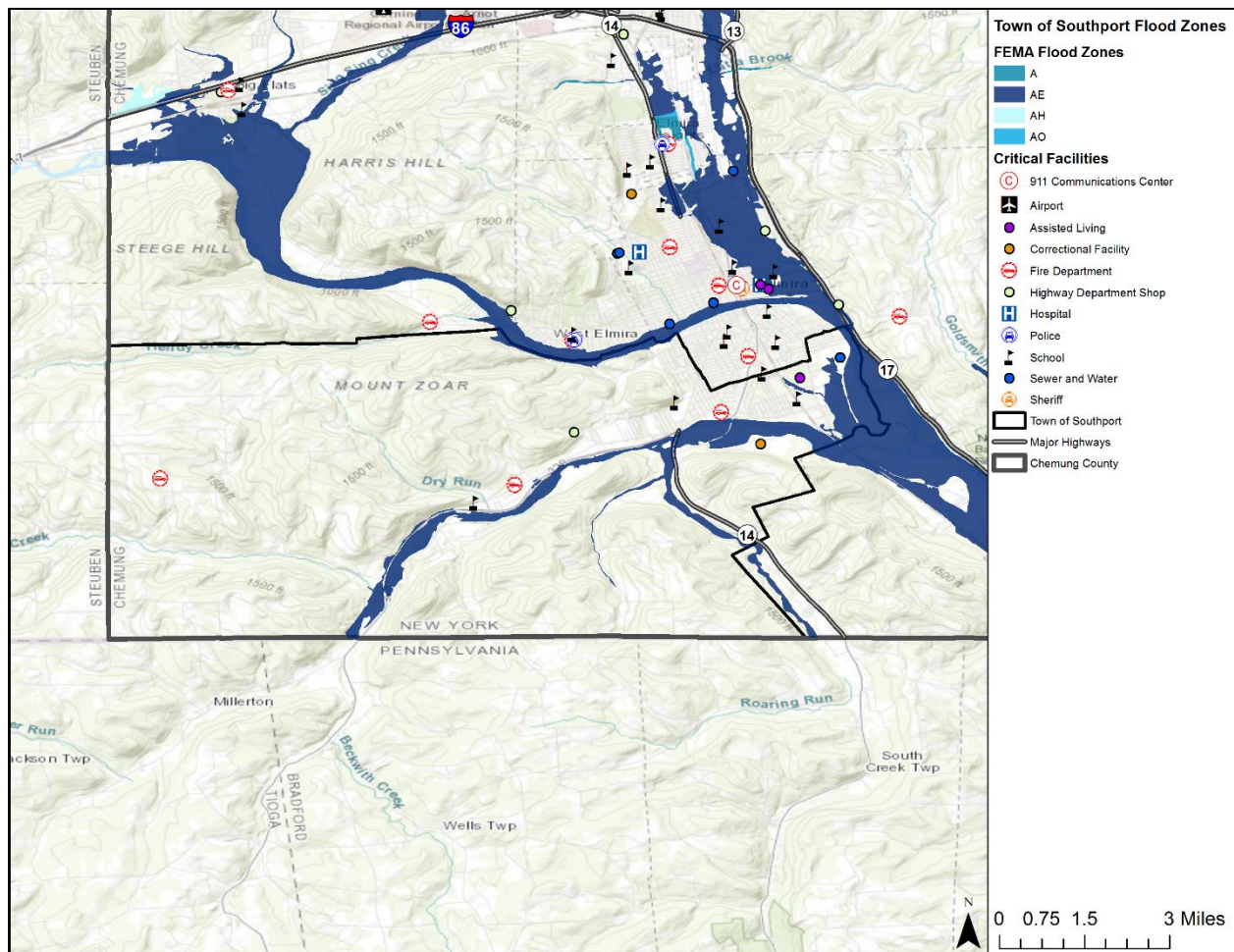
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Figure 7-13. Estimated Flood Zones in the Village of Millport



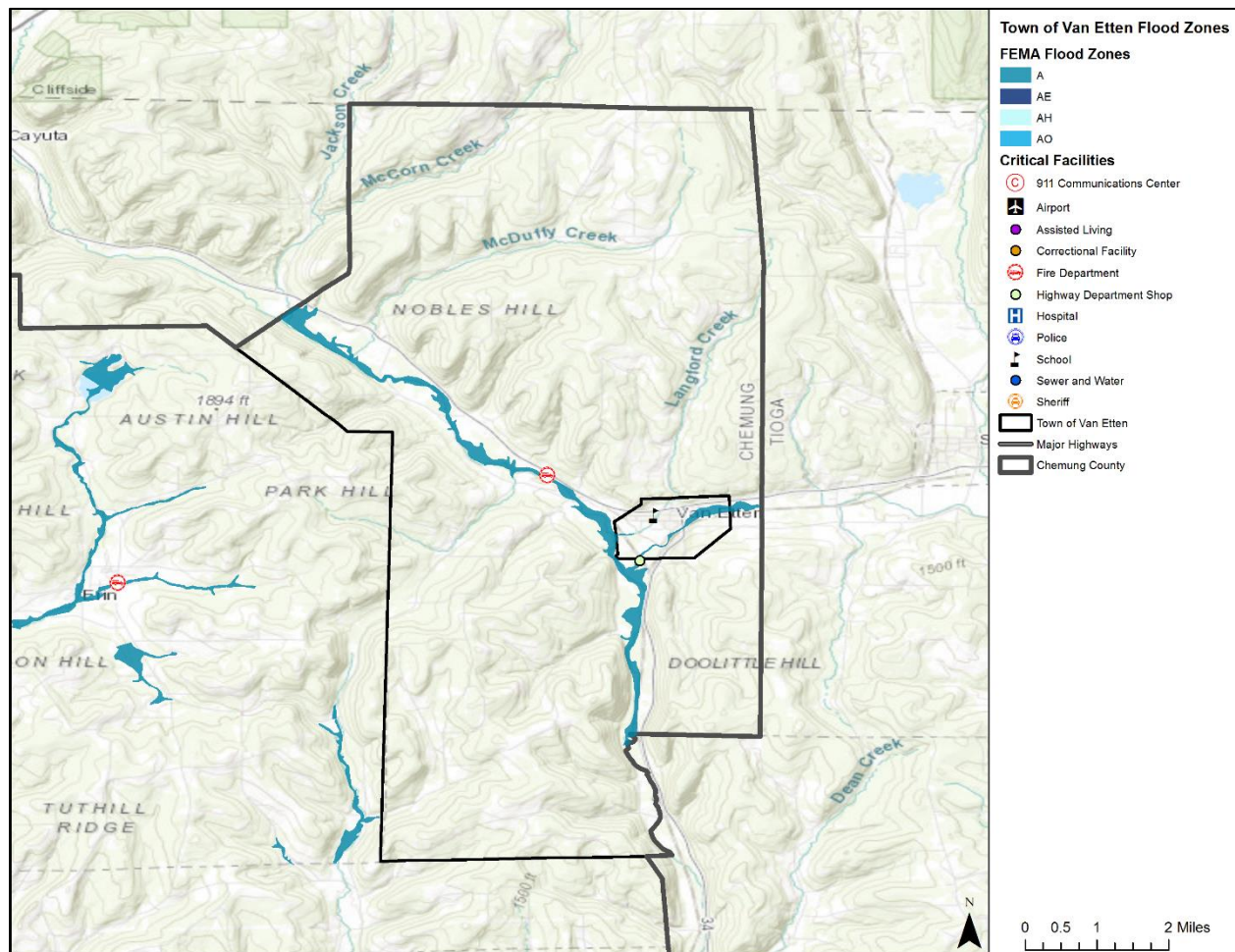
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Figure 7-14. Estimated Flood Zones in the Town of Southport



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Figure 7-15. Estimated Flood Zones in the Town of Van Etten



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Figure 7-16. Estimated Flood Zones in the Town of Veteran

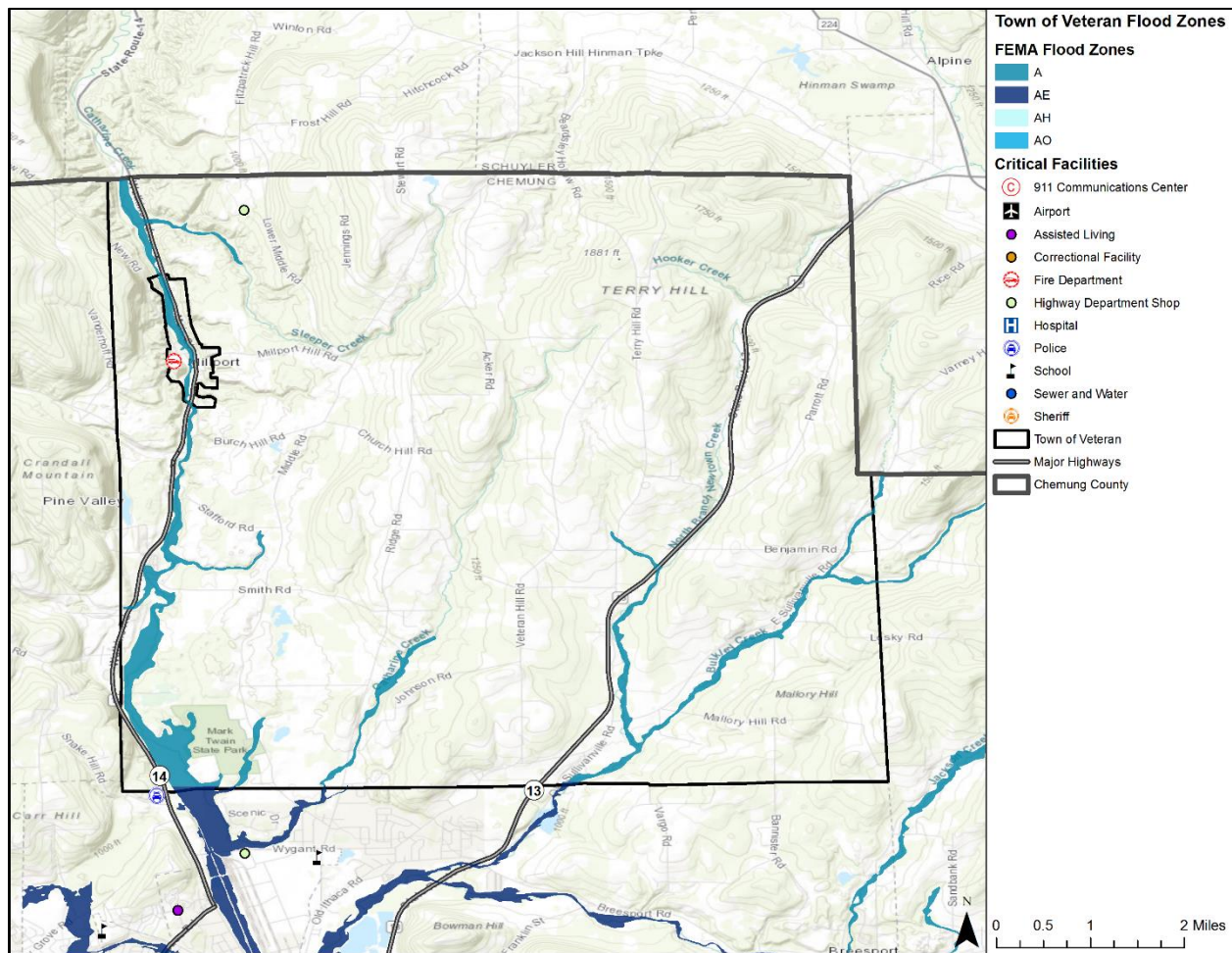
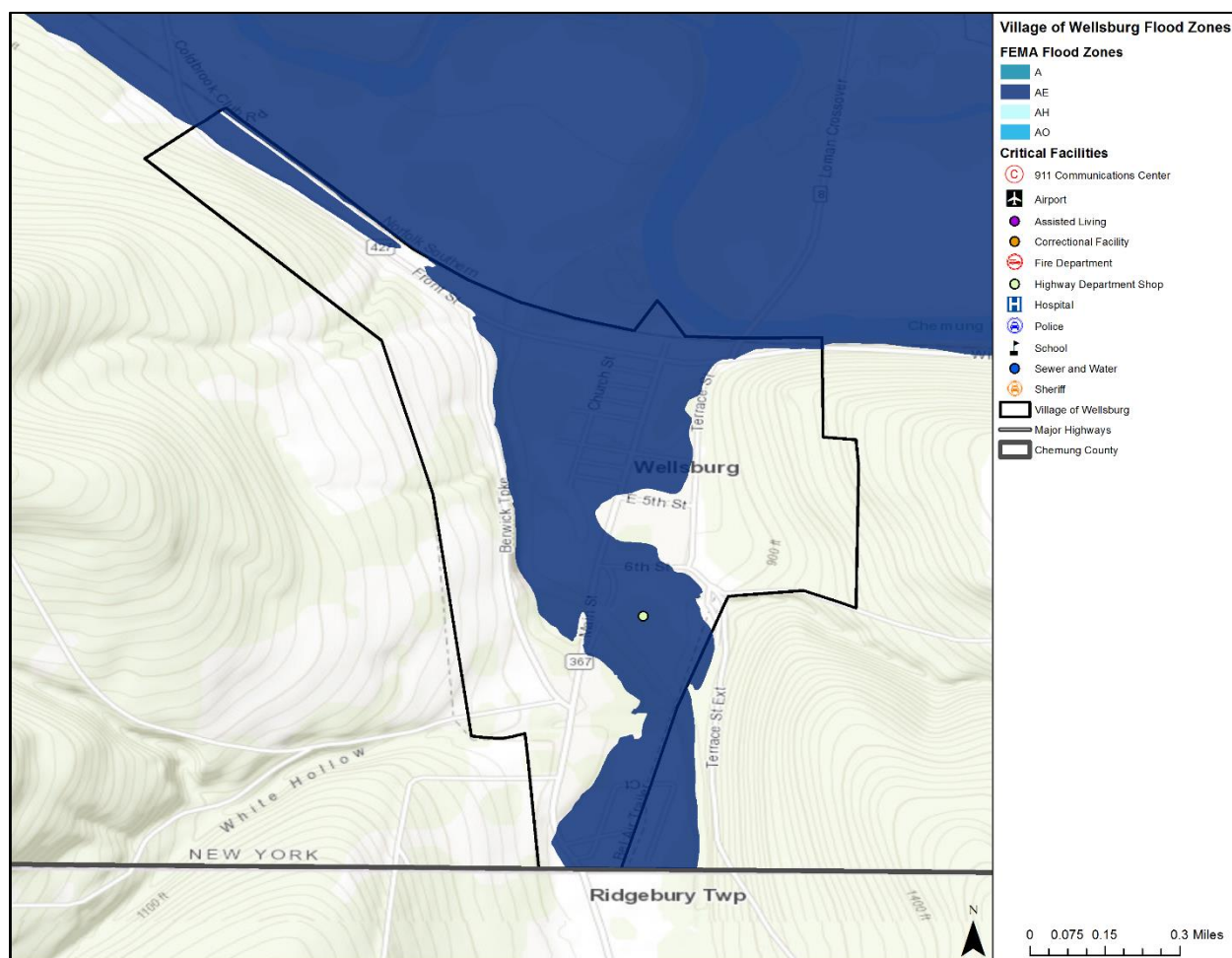


Figure 7-17. Estimated Flood Zones in the Village of Wellsburg

EXTENT

The severity of a flood event is determined by a combination of several factors including: stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and degree of vegetative clearing and impervious surface. Typically, floods are long-term events that may last for several days.

Determining the intensity and magnitude of a flood event is dependent upon the flood zone and location of the flood hazard area in addition to depths of flood waters. Extent of flood damages can be expected to be more damaging in the areas that will convey a base flood. FEMA categorizes areas on the terrain according to how the area will convey flood water. Flood zones are the categories that are mapped on Flood Insurance Rate Maps. Table 7-1 provides a description of FEMA flood zones and the flood impact in terms of severity or potential harm. Flood Zones A, AE, AO and X are the only hazard areas mapped in the planning area. Figures 7-1 through 7-17 should be read in conjunction with the extent for flooding in Tables 7-1, 7-2, and 7-3 to determine the intensity of a potential flood event.

Table 7-1. Flood Zones

INTENSITY	ZONE	DESCRIPTION
HIGH	ZONE A	Areas with a one percent annual chance of flooding and a 26 percent chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones.
	ZONE A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a Base Flood Elevation (BFE) (old format).
	ZONE AE	The base floodplain where base flood elevations are provided. AE Zones are now used on the new format FIRMs instead of A1-A30 Zones.
	ZONE AO	River or stream flood hazard areas and areas with a one percent or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from one to three feet. These areas have a 26 percent chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
	ZONE AH	Areas with a one percent annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from one to three feet. These areas have a 26 percent chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
	ZONE A99	Areas with a one percent annual chance of flooding that will be protected by a federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.
MODERATE to LOW	ZONE AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
	ZONE X 500	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than one foot or with drainage areas less than one square mile; or an area protected by levees from 100-year flooding.

Zone A is interchangeably referred to as the 100-year flood, the one-percent-annual chance flood, the Special Flood Hazard Area (SFHA), or more commonly, the base flood. This is the area that will convey the base flood and constitutes a threat to the planning area. The impact from a flood event can be more damaging in areas that will convey a base flood.

Structures built in the SFHA are subject to damage by rising waters and floating debris. Moving flood water exerts pressure on everything in its path and causes erosion of soil and solid objects. Utility systems, such

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as heating, ventilation, air conditioning, fuel, electrical systems, sewage maintenance systems and water systems, if not elevated above base flood elevation, may also be damaged.

The intensity and magnitude of a flood event is also determined by the depth of flood waters. . Table 7-2 describes the historic stream gauge data provided by the United States Geological Survey (USGS).

Table 7-2. Extent for the Chemung County Planning Area¹

JURISDICTION ²	PEAK FLOOD EVENT
Town of Big Flats	Cuthrie Run near in the Town of Big Flats reached an overflow elevation of 18.3 feet in June of 1976.
Town of Horseheads	Newtown Creek at Horseheads reached an overflow elevation of 7.0 feet in September of 1975.
City of Elmira	Newtown Creek at the City of Elmira reached an overflow elevation of 19.28 in June of 1972.
City of Elmira	Chemung River at the City of Elmira reached an overflow elevation of 18.51 in January of 1996.
Town of Chemung	Chemung River at the Town of Chemung reached an overflow elevation of 31.62 in June of 1972.

The range of flood intensity that the Chemung County Planning Area can experience is high, or Zone A. Based on historical occurrences the planning area, participating jurisdictions could typically expect to experience up to 5 inches of rainfall within an 8-hour period, resulting in flash flooding.

The data described in Tables 7-1 through 7-2, together with Figures 7-1 through 7-17, provides an estimated potential magnitude and severity for the planning area. For example, the City of Elmira, as shown in Figure 7-7, has areas designated as Zone A and Zone AE. Reading this figure in conjunction with Table 7-1 means the area is an area of high risk for flood.

HISTORICAL OCCURENCES

Historical evidence indicates that areas within the planning area are susceptible to flooding, especially in the form of flash flooding. It is important to note that only flood events that have been reported have been factored into this risk assessment, therefore it is likely that additional flood occurrences have gone unreported before and during the recording period. Table 7-3 identifies historical flood events that resulted in damages, injuries, or fatalities within the Chemung County Planning Area, including all participating jurisdictions. Table 7-4 provides the historical flood event summary by jurisdiction. Historical Data is provided by the Storm Prediction Center (NOAA), NCEI database for the planning area. Historical flood data are provided on a county-wide basis below and within a City-wide basis per the NCEI database in Annex A through N.

¹ Peak events are based on U.S. Geological Survey data.

² Peak data was provided for jurisdictions where available.

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Table 7-3. Historical Flood Events, 1996-2018³

JURISDICTION	DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Chemung County	1/19/1996	8:30 AM	0	0	\$29,004,316	\$0
Chemung County	11/8/1996	8:45 AM	0	0	\$2,379,458	\$0
Town of Southport	12/1/1996	10:30 PM	0	0	\$15,863	\$0
Chemung County	1/6/1998	12:00 PM	0	0	\$31,137	\$0
Town & Village of Horseheads	5/28/2002	3:10 PM	0	0	\$13,993	\$0
Chemung County	7/22/2003	6:00 PM	0	0	\$684,035	\$0
Town of Southport	8/9/2003	7:50 PM	0	0	\$1,022,161	\$0
Town of Erin	7/7/2004	5:35 PM	0	0	\$6,642	\$0
Town & Village of Elmira	8/30/2004	1:20 PM	0	0	\$6,638	\$0
Chemung County	9/9/2004	2:00 PM	0	0	\$662,422	\$0
Chemung County	9/10/2004	3:00 AM	0	0	\$66,242	\$0
Chemung County	9/17/2004	8:15 PM	0	0	\$1,324,845	\$0
Chemung County	9/18/2004	3:45 AM	0	0	\$132,484	\$0
Chemung County	9/18/2004	6:15 AM	0	0	\$132,484	\$0
Chemung County	4/2/2005	8:00 PM	0	0	\$129,285	\$0
Chemung County	4/2/2005	11:32 PM	0	0	\$64,642	\$0
Chemung County	4/3/2005	3:38 AM	0	0	\$129,285	\$0
Town of Big Flats	6/10/2005	6:00 PM	0	0	\$25,870	\$0
Chemung County	11/29/2005	7:00 PM	0	0	\$12,732	\$0
Chemung County	11/30/2005	5:49 AM	0	0	\$6,366	\$0
Chemung County	6/27/2006	5:00 PM	0	0	\$6,200	\$0
City & Town of Elmira	3/15/2007	8:45 AM	0	0	\$6,126	\$0
Town of Big Flats	4/25/2011	10:00 PM	0	0	\$11,186	\$0

³ Only recorded events with fatalities, injuries, and/or damages are listed, values are in 2018 dollars. Events reported from January 1996 through June 2018.

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JURISDICTION	DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Chemung	4/27/2011	9:00 PM	0	0	\$447,454	\$0
City & Town of Elmira	9/7/2011	2:00 PM	0	0	\$1,108,859	\$0
Town of Big Flats	8/8/2013	11:50 PM	0	0	\$21,515	\$0
Town of Catlin	8/8/2013	10:00 PM	0	0	\$161,359	\$0
Town of Catlin	8/8/2013	9:30 PM	0	0	\$80,680	\$0
Village of Elmira Heights	6/25/2014	3:45 PM	0	0	\$10,556	\$0
City & Town of Elmira	7/14/2015	6:30 PM	0	0	\$105,420	\$0

Table 7-4. Summary of Historical Flood Events, 1996-2018⁴

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Chemung County	20	0	0	\$34,765,934	\$0
Town of Ashland	1	0	0	\$0	\$0
Town of Baldwin	0	N/A	N/A	N/A	N/A
Town of Big Flats	3	0	0	\$58,571	\$0
Town of Catlin	2	0	0	\$242,039	\$0
Town of Chemung	3	0	0	\$447,454	\$0
City & Town of Elmira ⁵	4	0	0	\$1,227,043	\$0
Village of Elmira Heights	1	0	0	\$10,556	\$0
Town of Erin	1	0	0	\$6,642	\$0
Town & Village of Horseheads ⁶	1	0	0	\$13,993	\$0
Village of Millport	0	N/A	N/A	N/A	N/A
Town of Southport	2	0	0	\$1,038,024	\$0

⁴ Events reported from January 1996 through June 2018.

⁵ City and Town of Elmira are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

⁶⁶ Town and Village of Horseheads are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

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JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Van Etten	0	N/A	N/A	N/A	N/A
Town of Veteran	1	0	0	\$0	\$0
Village of Wellsburg	1	0	0	\$0	\$0
Planning Area Totals	39	0	0	\$37,810,256	\$0

Based on the list of historical flood events for the Chemung County Planning Area (listed above), including all participating jurisdictions, 5 events have occurred since the 2012 Plan.

SIGNIFICANT EVENTS

July 22, 2003- Chemung County

Two-day rainfall between 2 and 4 inches fell on the 21st into the 22nd. Very slow-moving thunderstorms on the 22nd caused flash flooding. The excessive rainfall caused flooding along Catherine Creek. Several roads were closed as a result of this flooding.

September 7, 2011- Chemung County

Major flash flooding took place across most of the small streams, creeks and poor drainage areas in eastern Chemung County. Many roads and bridges were washed out.

July 14, 2015- City of Elmira

Numerous underpasses in the City of Elmira were flooded by standing water up to 5 feet deep. Several cars were stranded which required the occupants to be rescued by emergency personnel.

August 13-15, 2018 – Chemung County

FEMA 4397-DR-NY August Flood Disaster Declaration: Severe storms and flooding occurred in several municipalities over the 3-day event. Most of the damage was stream and roadside drainage structure erosion to many of the roads. Several private bridges were destroyed in Southport along Christian Hollow, and one person was trapped in a car, however she was rescued just before her car was swept away by the flood waters. Flooding impacted about a dozen homes in living space and probably 150 to 200 or better homes had basement water with impacts to utilities. Several culverts (large pipes, not concrete box culverts) were entirely washed out. There were a dozen roads with sections closed for multiple days until emergency repairs could be made. The municipalities affected were Chemung County, Ashland, Big Flats, Catlin, Town of Elmira, Erin, Town of Horseheads, Millport, Southport, Veteran, and Wellsburg. Total damage estimate was approximately \$15 million dollars.

PROBABILTY OF FUTURE EVENTS

Based on recorded historical occurrences and extent within the Chemung County Planning Area, including all participating jurisdictions, flooding is highly likely and an event will likely occur within the next year.

VULNERABILITY AND IMPACT

A property's vulnerability to a flood depends on its location and proximity to the floodplain. Structures that lie along banks of a waterway are the most vulnerable and are often repetitive loss structures. The County and all participating jurisdictions encourage development outside of the floodplain. All participating

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jurisdictions, including the county, have developed a temporary housing plan for residents displaced from a flood event. Each temporary housing plan has been included in Appendix F.

The property damage impact for flood for the entire planning area is limited as facilities and services would be shut down for 24 hours or less, and less than 10 percent of property would be destroyed or suffer major damage.

Table 7-5 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table 7-5. Critical Facilities in the Floodplain by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Chemung County	N/A
Town of Ashland	None
Town of Baldwin	None
Town of Big Flats	None
Town of Catlin	None
Town of Chemung	None
City of Elmira	3 Schools, 1 Assisted Living Facility, 1 Hospital
Town of Elmira	None
Village of Elmira Heights	None
Town of Erin	None
Town of Horseheads	1 Fire Station
Village of Horseheads	None
Village of Millport	None
Town of Southport	1 Fire Station
Town of Van Etten	1 Fire Station
Town of Veteran	None
Village of Wellsburg	1 Highway Department Shop

Historic loss estimates due to flood are presented in Table 7-6 below. Considering 39 flood events over a 22-year period, frequency is approximately one to two events every year.

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Table 7-6. Potential Annualized Losses by Jurisdiction, 1996-2018⁷

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Chemung County	20	0	0	\$34,765,934	\$1,545,153
Town of Ashland	1	0	0	\$0	\$0
Town of Baldwin	0	N/A	N/A	N/A	N/A
Town of Big Flats	3	0	0	\$58,571	\$2,603
Town of Catlin	2	0	0	\$242,039	\$10,757
Town of Chemung	3	0	0	\$447,454	\$19,887
City & Town of Elmira ⁸	4	0	0	\$1,227,043	\$54,535
Village of Elmira Heights	1	0	0	\$10,556	\$469
Town of Erin	1	0	0	\$6,642	\$295
Town & Village of Horseheads ⁹	1	0	0	\$13,993	\$622
Village of Millport	0	N/A	N/A	N/A	N/A
Town of Southport	2	0	0	\$1,038,024	\$46,134
Town of Van Etten	0	N/A	N/A	N/A	N/A
Town of Veteran	1	0	0	\$0	\$0
Village of Wellsburg	1	0	0	\$0	\$0
Planning Area Total	39	0	0	\$37,810,256	\$1,680,456

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table 7-7 depicts the level of impact for the Chemung County Planning Area and each participating jurisdiction.

⁷ Events reported from January 1996 through June 2018.

⁸ City and Town of Elmira are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

⁹ Town and Village of Horseheads are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

Table 7-7. Impact by Jurisdiction

JURISDICTION	IMPACT	DESCRIPTION
Chemung County	Limited	Chemung County could have injuries that would be treatable with first aid. Critical facilities would typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Town of Ashland	Limited	The Town of Ashland could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Town of Baldwin	Limited	The Town of Baldwin could have injuries that would be treatable with first aid. Critical facilities would be shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Town of Big Flats	Limited	The Town of Big Flats could have injuries that would be treatable with first aid. Critical facilities would be shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Town of Catlin	Limited	The Town of Catlin could have injuries that would be treatable with first aid. Critical facilities would be shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Town of Chemung	Limited	The Town of Chemung could have injuries that would be treatable with first aid. Critical facilities would be shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
City of Elmira	Limited	The City of Elmira could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Town of Elmira	Limited	The Town of Elmira could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Village of Elmira Heights	Limited	The Village of Elmira Heights could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Town of Erin	Limited	The Town of Erin could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Town of Horseheads	Limited	The Town of Horseheads could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Village of Horseheads	Limited	The Village of Horseheads could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Village of Millport	Limited	The Village of Millport could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

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JURISDICTION	IMPACT	DESCRIPTION
Town of Southport	Limited	The Town of Southport could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Town of Van Etten	Limited	The Town of Van Etten could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Town of Veteran	Limited	The Town of Veteran could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.
Village of Wellsburg	Minor	The Village of Wellsburg could have minor property damage with a complete shutdown of critical facilities for more than one week and more than 10 percent of property destroyed or with major damage.

ASSESSMENT OF IMPACTS

Flooding is the deadliest natural disaster that occurs in the U.S. each year, and it poses a constant and significant threat to the health and safety of the people in the entire Chemung County Planning Area. Impacts to the planning area can include:

- Recreation activities at places such as the Park Station Campground may be unavailable and tourism can be unappealing for years following a large flood event, devastating directly related local businesses and negatively impacting economic recovery.
- Flood-related damages, particularly from flash floods, includes significant damages to roadways from scouring, representing considerable damages to the jurisdictions during even minor events.
- Flood-related rescues may be necessary at swift and low water crossings or in flooded neighborhoods where roads have become impassable, placing first responders in harm's way.
- Evacuations may be required for entire neighborhoods because of rising floodwaters, further taxing limited response capabilities and increasing sheltering needs for displaced residents.
- Health risks and threats to residents are elevated after the flood waters have receded due to contaminated flood waters (untreated sewage and hazardous chemicals) and mold growth typical in flooded buildings and homes.
- Significant flood events often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage can result in an increase in structure fires and/or carbon monoxide poisoning as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Floods can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders are exposed to downed power lines, contaminated and potentially unstable debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities.
- Significant flooding can result in the inability of emergency response vehicles to access areas of the community.
- Critical staff may suffer personal losses or otherwise impacted by a flood event and unable to report for duty, limiting response capabilities.

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- City or county departments may be flooded, delaying response and recovery efforts for the entire community.
- Private sector entities that the jurisdiction and its residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- Some businesses not directly damaged by the flood may be negatively impacted while utilities are being restored or water recedes, further slowing economic recovery.
- When the community is affected by significant property damage it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Residential structures substantially damaged by a flood may not be rebuilt for years and uninsured or underinsured residential structures may never be rebuilt, reducing the tax base for the community.
- Large floods may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and/or work outside of the affected area.
- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.
- Flooding may cause significant disruptions of clean water and sewer services, elevating health risks and delaying recovery efforts.
- The psycho-social effects on flood victims and their families can traumatize them for long periods of time, creating long term increases in medical treatment and services.
- Extensive or repetitive flooding can lead to decreases in property value for the affected community.
- Flood poses a potential catastrophic risk to annual and perennial crop production and overall crop quality leading to higher food costs.
- Flood related declines in production may lead to an increase in unemployment.
- Large floods may result in loss of livestock, potential increased livestock mortality due to stress and water borne disease, and increased cost for feed.

The overall extent of damages caused by floods is dependent on the extent, depth and duration of flooding, and the velocities of flows in the flooded areas. The level of preparedness and pre-event planning done by government, businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a flood event.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

Flood insurance offered through the National Flood Insurance Program (NFIP) is the best way for home and business owners to protect themselves financially against the flood hazard. All incorporated jurisdictions in the Chemung County Planning Area participate in the NFIP and are in good standing. Chemung County does not have any areas that are unincorporated, therefore the county is not eligible for NFIP participation.

The following participating communities currently participate in the Community Rating System and have in place flood damage prevention ordinances that include standards above the minimum FEMA requirement such as 24" of freeboard: Town of Ashland, Town of Big Flats, Town of Chemung, City of Elmira, Town of Horseheads, Village of Horseheads, Town of Southport, and the Village of Wellsburg. All other participating jurisdictions currently have in place minimum NFIP standards for new construction and substantial

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improvements of structures. Many municipalities in New York are small and lack the professional support to fill out a CRS application, or do not have the flood insurance policy base to make it worthwhile. However, Community Assistance Visits (CAV), Community Assistance Contacts (CAC), technical assistance contacts, and workshops help to promote the CRS program in these small towns. All NFIP participants regulate development in the Special Flood Hazard Areas (SFHAs). All jurisdictions are considering adopting additional higher regulatory NFIP standards to limit floodplain development.

The flood hazard areas throughout the Chemung County Planning Area are subject to periodic inundation, which may result in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief, which may adversely affect public safety.

These flood losses are created by the cumulative effect of obstructions in floodplains which cause an increase in flood heights and velocities, and by the occupancy of flood hazard areas by uses vulnerable to floods and hazardous to other lands because they are inadequately elevated, flood-proofed or otherwise protected from flood damage. Mitigation actions are included to address flood maintenance issues as well, including routinely clearing debris from drainage systems and bridges and expanding drainage culverts and storm water structures to more adequately convey flood waters.

It is the purpose of the Chemung County Planning Area, including all participating jurisdictions to continue to promote the public health, safety and general welfare by minimizing public and private losses due to flood conditions in specific areas. All of the NFIP participating jurisdictions in the Plan are guided by their local Flood Damage Prevention Ordinance. These communities will continue to comply with NFIP requirements through their local permitting, inspection, and record-keeping requirements for new and substantially developed construction. Further, the NFIP program for both of the participating jurisdictions promotes sound development in floodplain areas and includes provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in floodplains;
- Help maintain a stable tax base by providing for the sound use and development of flood-prone areas in such a manner as to minimize future flood blight areas; and
- Ensure that potential buyers are notified that property is in a flood area.

In order to accomplish these tasks, the Chemung County Planning Area, including all participating jurisdictions, seek to follow these guidelines to achieve flood mitigation by:

- Restrict or prohibit uses that are dangerous to health, safety, or property in times of flood, such as filling or dumping, that may cause excessive increases in flood heights and/or velocities;
- Require that uses vulnerable to floods, including facilities, which serve such uses, be protected against flood damage at the time of initial construction as a method of reducing flood losses;
- Control the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of floodwaters;
- Control filling, grading, dredging, and other development, which may increase flood damage; and
- Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands.

NFIP COMPLIANCE AND MAINTENANCE

As mentioned, the Chemung County Planning Area, including all participating jurisdictions, have developed mitigation actions that relate to either NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12.

Flooding was identified by the majority of the participating jurisdictions as a high-risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. A majority of these flood actions address compliance with the NFIP and implementing flood awareness programs. All jurisdictions recognize the need and are working towards adopting higher NFIP regulatory standards to further minimize flood risk in their community. In addition, all jurisdictions are focusing on NFIP public awareness activities. This includes promoting the availability of flood insurance by placing NFIP brochures and flyers in public libraries or public meeting places.

All participating jurisdictions in the NFIP have a designated floodplain administrator. The floodplain administrators in the planning area will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by each participating jurisdiction outlines the minimum requirements for development in special flood hazard areas. Table 7-9 provides the most recent CAV dates along with the current status for each participating jurisdiction.

Table 7-9. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Chemung County	N/A	N/A	N/A	N/A
Town of Ashland	07/30/2008	07/30/2013	Good Standing	11
Town of Baldwin	1/12/2017	04/04/2006	Good Standing	9
Town of Big Flats	05/16/2006	09/19/2012	Good Standing	86
Town of Catlin		06/18/2012	Good Standing	6
Town of Chemung	01/26/2016	08/22/2012	Good Standing	23
City of Elmira		09/27/2012	Good Standing	184
Town of Elmira		06/12/2013	Good Standing	56
Village of Elmira Heights		09/09/2015	Good Standing	49
Town of Erin	07/08/1992	05/07/2012	Good Standing	7
Town of Horseheads		07/12/2012	Good Standing	95
Village of Horseheads		06/14/2016	Good Standing	0
Village of Millport		01/22/2007	Good Standing	3
Town of Southport		04/26/2013	Good Standing	49

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JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Town of Van Etten	03/27/2007		Good Standing	2
Town of Veteran		05/04/2015	Good Standing	9
Village of Wellsburg	11/07/2011	08/08/2013	Good Standing	41

NFIP REPETITIVE LOSS PROPERTIES

The Severe Repetitive Loss (SRL) Grant Program under FEMA provides federal funding to assist states and communities in implementing mitigation measures to reduce or eliminate the long-term risk of flood damage to severe repetitive loss residential structures insured under the NFIP. New York State administers the SRL grant program for the State of New York. One of the goals of the FMA program is to reduce the burden of repetitive loss and severe repetitive loss properties on the NFIP through mitigation activities that significantly reduce or eliminate the threat of future flood damages.

Repetitive Loss properties are defined as structures that are:

- Any insurable building for which 2 or more claims of more than \$1,000 each, paid by the National Flood Insurance Program (NFIP) within any 10-year period, since 1978;
- May or may not be currently insured under the NFIP.

Severe Repetitive Loss properties are defined as residential properties that are:

- Covered under the NFIP and have at least four flood related damage claim payments (building and contents) over \$5,000.00 each, and the cumulative amount of such claim payments exceed \$20,000; or
- At least two separate claim payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

In either scenario, at least two of the referenced claims must have occurred within any ten-year period and must be greater than 10 days apart. Table 7-10 shows repetitive loss and severe repetitive loss properties for the Chemung County Planning Area, including all participating jurisdictions. There are no repetitive loss properties reported for the following jurisdictions: Town of Chemung, Town of Elmira, City of Elmira, Town of Erin, Village of Horseheads, Village of Millport, the Town of Van Etten and the Town of Veteran.

Table 7-10. Repetitive Loss and Severe Repetitive Loss Properties

JURISDICTION	BUILDING TYPE	NUMBER OF STRUCTURES	NUMBER OF LOSSES
Town of Ashland	Single Family	2	4
	2-4 Family	2	4
Town of Baldwin	Single Family	4	8
Town of Big Flats	Single Family	1	3
	2-4 Family	1	2

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JURISDICTION	BUILDING TYPE	NUMBER OF STRUCTURES	NUMBER OF LOSSES
Town of Catlin	Single Family	1	2
Village of Elmira Heights	Single Family	3	6
Town of Horseheads	Single Family	1	2
Town of Southport	Other Non-Residential	1	3
Village of Wellsburg	Single Family	1	2

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HAZARD DESCRIPTION



Tornadoes are among the most violent storms on the planet. A tornado is a rapidly rotating column of air extending between, and in contact with, a cloud and the surface of the earth. The most violent tornadoes are capable of tremendous destruction and have wind speeds of 250 miles per hour or more. In extreme cases, winds may approach 300 miles per hour. Damage paths can be in excess of one mile wide and 50 miles long.

The most powerful tornadoes are produced by “Supercell Thunderstorms.” These thunderstorms are created when horizontal wind shears (winds moving in different directions at different altitudes) begin to rotate the storm. This horizontal rotation can be tilted vertically by violent updrafts, and the rotation radius can shrink, forming a vertical column of very quickly swirling air. This rotating air can eventually reach the ground, forming a tornado.

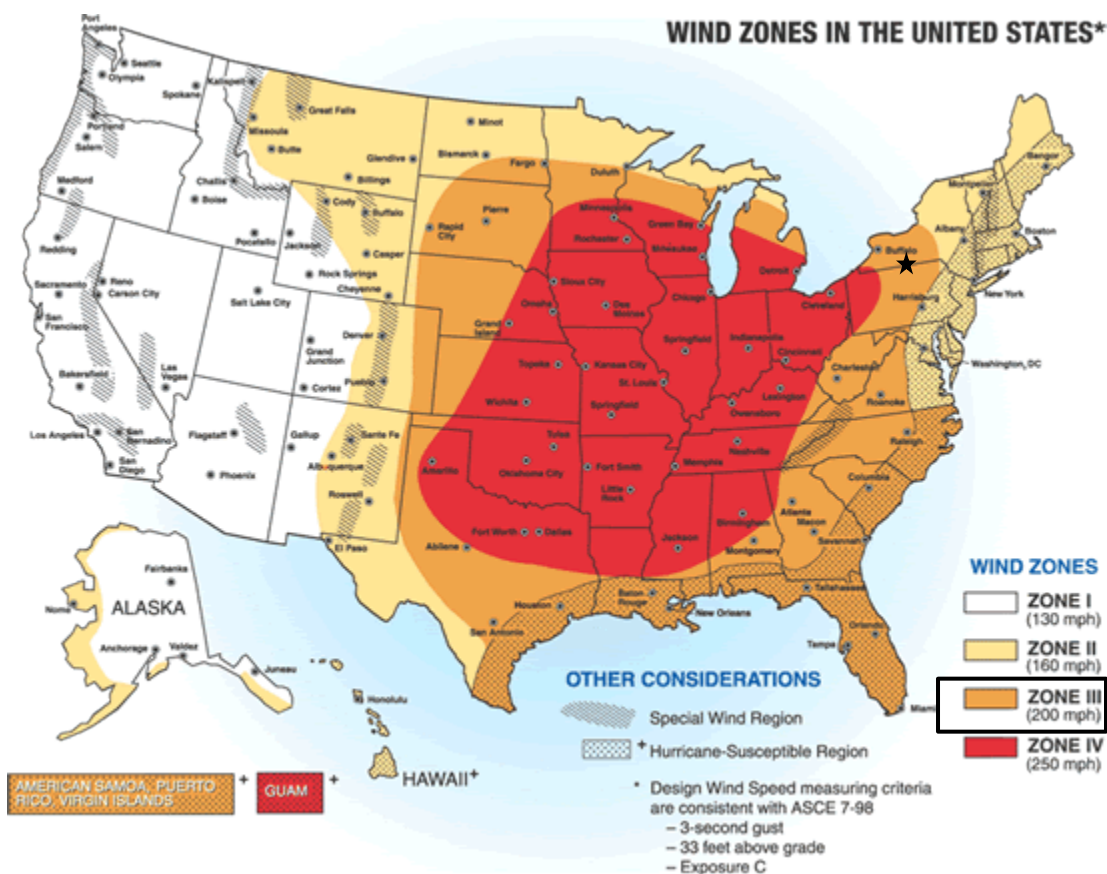
Table 8-1. Variations among Tornadoes

WEAK TORNADOES	STRONG TORNADOES	VIOLENT TORNADOES
<ul style="list-style-type: none"> ➤ 69% of all tornadoes ➤ Less than 5% of tornado deaths ➤ Lifetime 1-10+ minutes ➤ Winds less than 110 mph 	<ul style="list-style-type: none"> ➤ 29% of all tornadoes ➤ Nearly 30% of all tornado deaths ➤ May last 20 minutes or longer ➤ Winds 110 – 205 mph 	<ul style="list-style-type: none"> ➤ 2% of all tornadoes ➤ 70% of all tornado deaths ➤ Lifetime can exceed one hour ➤ Winds greater than 205 mph

LOCATION

Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly. It is assumed that the entire Chemung County Planning Area, including all participating jurisdictions, are uniformly exposed to tornado activity. The Chemung County Planning Area is located in Wind Zone III (Figure 8-1). Tornado winds can be as high as 200 mph.

Figure 8-1. FEMA Wind Zones in the United States¹



EXTENT

The destruction caused by tornadoes ranges from light to inconceivable, depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, such as residential homes (particularly mobile homes).

¹ The Chemung County Planning Area is indicated by the star.

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Table 8-2. The Fujita Tornado Scale²

F-SCALE NUMBER	INTENSITY	WIND SPEED (MPH)	TYPE OF DAMAGE DONE	PERCENT OF APPRAISED STRUCTURE VALUE LOST DUE TO DAMAGE
F0	Gale Tornado	40 – 72	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.	None Estimated
F1	Moderate Tornado	73 – 112	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off roads; attached garages may be destroyed.	0% – 20%
F2	Significant Tornado	113 – 157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.	50% – 100%
F3	Severe Tornado	158 – 206	Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.	100%
F4	Devastating Tornado	207 – 260	Well-constructed homes leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.	100%
F5	Incredible Tornado	261 – 318	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles flying through the air in excess of 330 yards; trees debarked; steel reinforced concrete badly damaged.	100%







Tornado magnitudes prior to 2005 were determined using the traditional version of the Fujita Scale (Table 8-2). Since February 2007, the Fujita Scale has been replaced by the Enhanced Fujita Scale (Table 8-3), which retains the same basic design and six strength categories as the previous scale. The newer scale

² Source: <http://www.tornadoproject.com/fscale/fscale.htm>

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reflects more refined assessments of tornado damage surveys, standardization, and damage consideration to a wider range of structures.

Table 8-3. Enhanced Fujita Scale for Tornadoes

STORM CATEGORY	DAMAGE LEVEL	3 SECOND GUST (MPH)	DESCRIPTION OF DAMAGES	PHOTO EXAMPLE
EF0	Gale	65 – 85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.	
EF1	Weak	86 – 110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off roads; attached garages may be destroyed.	
EF2	Strong	111 – 135	Considerable damage; roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.	
EF3	Severe	136 – 165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.	
EF4	Devastating	166 – 200	Well-constructed homes leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.	
EF5	Incredible	200+	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles flying through the air in excess of 330 yards; trees debarked; steel reinforced concrete badly damaged.	

Both the Fujita Scale and Enhanced Fujita Scale should be referenced in reviewing previous occurrences since tornado events prior to 2007 will follow the original Fujita Scale. The largest magnitude reported within the planning area is F3 on the Fujita Scale, a “Severe tornado”. Based on the planning areas location in Wind Zone III, the planning area could experience anywhere from an EF0 to a low EF5 depending on the wind speed. The events in the Chemung County Planning Area have been between F0 and F3 (Table 8-4). Therefore, the range of intensity that the Chemung County Planning Area, including all participating

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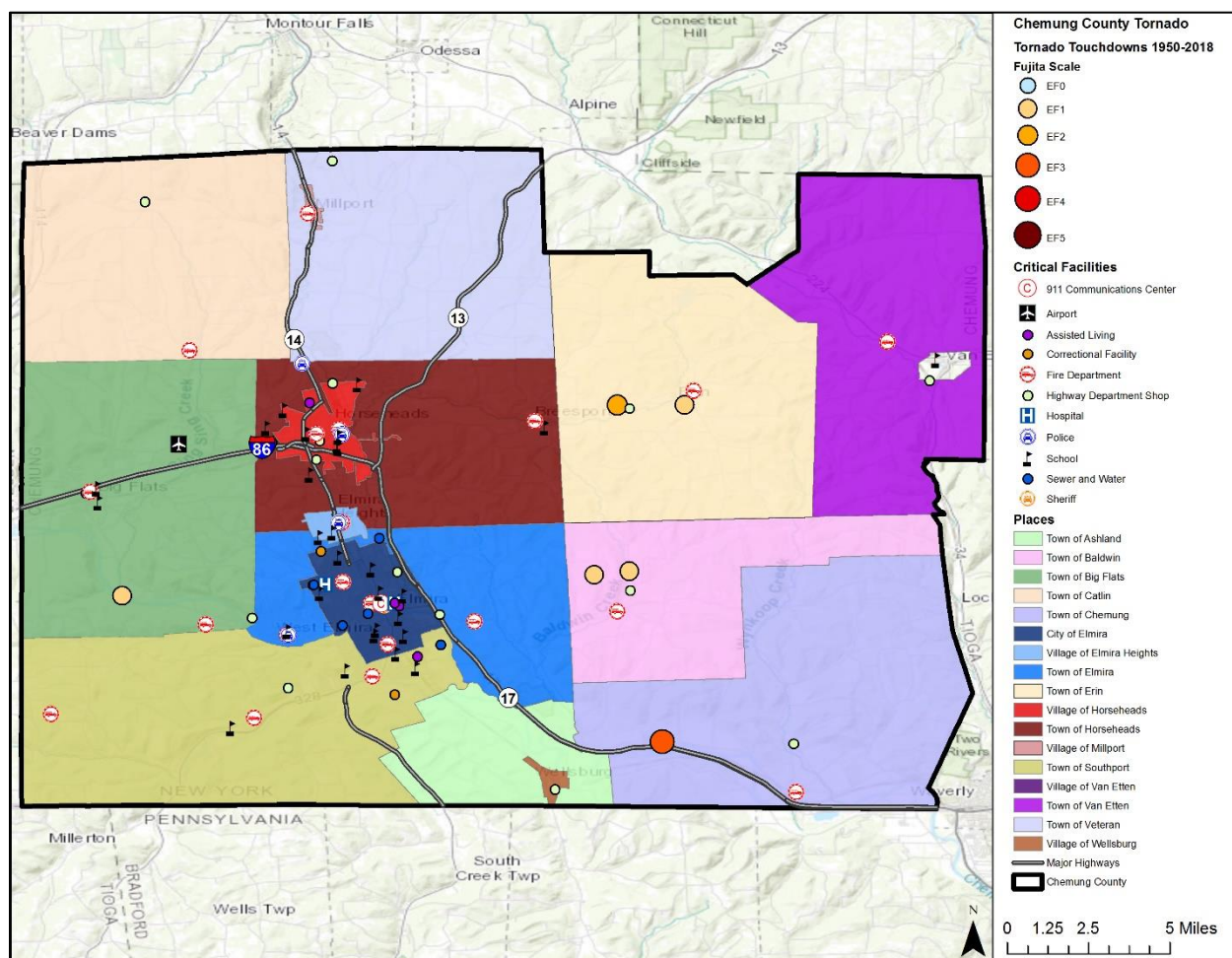
jurisdictions, would be expected to mitigate is a tornado event that would be a low to incredible risk, an EF0 to EF5.³

HISTORICAL OCCURRENCES

Only reported tornadoes were factored into the Risk Assessment. It is likely that a high number of occurrences have gone unreported over the past 35 years.

Figure 8-2 identifies the locations of previous occurrences in the Chemung County Planning Area from January 1983 through June 2018. A total of 6 events have been recorded by the Storm Prediction Center (NOAA) and NCEI databases for the entire planning area. The most significant event reported occurred just southeast of the City of Elmira on May 2, 1983. The F3 tornado and associated storm system caused substantial damage in the planning area, exceeding more than \$6,300,000 in damages in 2018 dollars. The tornado resulted in 6 injuries.

Figure 8-2. Spatial Historical Tornado Events, 1983-2018⁴



³ The 1983 F3 tornado wind speed range of 158-206 mph, converts to a potential EF5 on the Enhanced Fujita Scale.

⁴ Source: NOAA Records

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All recorded events have been listed in Table 8-4. The dollar amounts are estimated in 2018 dollars. Historical tornado data are provided on a county-wide basis below and within a City-wide basis per the NCEI database in Appendix A-N.

Table 8-4. Historical Tornado Events, 1983-2018⁵

JURISDICTION	DATE	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Chemung County	5/2/1983	F3	0	6	\$6,340,423	\$0
Town of Erin	11/16/2006	F1	0	0	\$12,486	\$0
Town of Erin	4/28/2011	EF2	0	0	\$643,216	\$0
Town of Chemung	7/26/2012	EF1	0	0	\$38,435	\$0
City of Elmira	7/26/2012	EF1	0	0	\$10,981,388	\$0
Town of Chemung	9/2/2014	EF1	0	0	\$105,695	\$0

Table 8-5. Summary of Historical Tornado Events, 1983-2018⁶

JURISDICTION	NUMBER OF EVENTS	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Chemung County	1	F3	0	6	\$6,340,423	\$0
Town of Ashland	0	N/A	N/A	N/A	N/A	N/A
Town of Baldwin	0	N/A	N/A	N/A	N/A	N/A
Town of Big Flats	0	N/A	N/A	N/A	N/A	N/A
Town of Catlin	0	N/A	N/A	N/A	N/A	N/A
Town of Chemung	2	EF1	0	0	\$144,130	\$0
City & Town of Elmira ⁷	1	EF1	0	0	\$10,981,388	\$0
Village of Elmira Heights	0	N/A	N/A	N/A	N/A	N/A
Town of Erin	2	EF2	0	0	\$655,702	\$0

⁵ Events recorded from January 1983 through June 2018.

⁶ Events recorded from January 1983 through June 2018.

⁷ City and Town of Elmira are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

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JURISDICTION	NUMBER OF EVENTS	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town & Village of Horseheads ⁸	0	N/A	N/A	N/A	N/A	N/A
Village of Millport	0	N/A	N/A	N/A	N/A	N/A
Town of Southport	0	N/A	N/A	N/A	N/A	N/A
Town of Van Etten	0	N/A	N/A	N/A	N/A	N/A
Town of Veteran	0	N/A	N/A	N/A	N/A	N/A
Village of Wellsburg	0	N/A	N/A	N/A	N/A	N/A
TOTAL LOSSES	6	(Max Extent)	0	6	\$18,121,644	

Based on the list of historical tornado events for the Chemung County Planning Area (listed above), including all participating jurisdictions, 3 of the events have occurred since the 2012 Plan.

SIGNIFICANT EVENTS

November 16, 2006- Town of Erin

A tornado touched down over the northern part of the town of Erin and tracked to the East-Northeast across Route 224 where it lifted on a hillside. Numerous trees were blown down and a garage collapsed. The winds that caused the damage are estimated between 70 and 80 mph.

April 28, 2011- Town of Erin

The tornado started just west of the Erin Town Hall, south of Route 223. It began just southwest of the local cemetery and tracked toward the northeast. Numerous pine trees were snapped off and uprooted in the cemetery. Immediately to the west of the cemetery, a well-constructed barn was destroyed, with all four walls completely collapsed. The tornado tracked northeast and across Route 223. The tornado lofted debris into the yard across the street with debris from the destroyed barn impaled into the front lawn. Debris also blew all the windows out of the front of the home, with some debris penetrating the siding and thrown into the home. At this site, all three vehicles were damaged with a beam from the destroyed barn impaled through the dashboard of one vehicle. An 11,000 pound camper was flipped up over a five foot fence and toppled onto its side before coming to rest.

The tornado continued tracking to the northeast with damage to a barn roof and debris wrapped in trees. A garage and mobile home were completely destroyed. Heavy debris from the mobile home was strewn approximately 100 yards downstream from the site, with lighter material found several miles away. The tornado tracked an additional one-half mile up the hill with numerous trees uprooted or snapped and two horses killed on the farm. At this point, the tornado lifted and no additional damage was found.

⁸ Town and Village of Horseheads are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

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July 26, 2012- City & Town of Elmira, Chemung County

A tornado touched down west of Elmira near Miracle Lane off of Route 352. It traveled through West Elmira and into the City of Elmira along Church Street. It felled hundreds of trees. Some trees smashed cars, homes, and porches. A brick building on Madison Avenue at Fifth Street was blown apart, with much of the debris landing on a car on Madison Avenue, trapping the vehicle's occupants. It was amazing no one was injured or killed. The damage path widened while in downtown Elmira between Route 14 and Route 17. Then the tornado turned towards the southeast and traveled in a path near Jerusalem Hill Road. It lifted near the intersection of Jerusalem Hill Road and Monkey Run Road.

PROBABILITY OF FUTURE EVENTS

Tornadic storms can occur at any time of year and at any time of day, but they are typically more common in the spring months during the late afternoon and evening hours. A smaller, high frequency period can emerge in the fall during the brief transition between the warm and cold seasons. According to historical records, the planning area can experience a tornado touchdown approximately once every three years. This frequency supports a likely probability of future events for the Chemung County Planning Area, including all participating jurisdictions.

VULNERABILITY AND IMPACT

Because tornadoes often cross jurisdictional boundaries, all existing and future buildings, facilities, and populations in planning area are considered to be exposed to this hazard and could potentially be impacted. The damage caused by a tornado is typically a result of high wind velocity, wind-blown debris, lightning, and large hail.

The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Consequently, vulnerability of humans and property is difficult to evaluate since tornadoes form at different strengths, in random locations, and create relatively narrow paths of destruction. Although tornadoes strike at random, making all buildings vulnerable, three types of structures are more likely to suffer damage:

- Manufactured Homes;
- Homes on crawlspaces (more susceptible to lift); and
- Buildings with large spans, such as shopping malls, gymnasiums, and factories.

Tornadoes can cause a significant threat to people as they could be struck by flying debris, falling trees/branches, utility lines, and poles. Blocked roads could prevent first responders to respond to calls. Tornadoes commonly cause power outages which could cause health and safety risks to residents, as well as to patients in hospitals.

The Chemung County Planning Area features multiple mobile or manufactured home parks throughout the planning area, including all participating jurisdictions except the Town of Elmira and the Village of Elmira Heights. These parks are typically more vulnerable to tornado events than typical site built structures. In addition, manufactured homes are located sporadically throughout portions of the planning area which would also be more vulnerable. The U.S. Census data indicates a total of 2,206 manufactured homes (Table 8-6) located in the Chemung County Planning Area (5.0% of housing units). In addition, 84.1% (approximately 36,849 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction

SECTION 8: TORNADO

standards than newer construction and may be more susceptible to damages during significant tornado events.

Table 8-6. Structures at Greater Risk by Jurisdiction

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Chemung County (Totals)	2,206	36,849
Town of Ashland	278	476
Town of Baldwin	172	281
Town of Big Flats	211	2,386
Town of Catlin	244	622
Town of Chemung	223	736
City of Elmira	20	11,517
Town of Elmira	0	2,778
Village of Elmira Heights	0	1,610
Town of Erin	293	493
Town of Horseheads	177	6,940
Village of Horseheads	24	2,550
Village of Millport	41	176
Town of Southport	85	4,447
Town of Van Etten	192	469
Town of Veteran	188	1,159
Village of Wellsburg	58	209

The following critical facilities would be vulnerable to tornado events in each participating jurisdiction:

Table 8-7. Critical Facilities at Risk by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Chemung County	1 911 Communications Center, 1 Airport, 3 Correctional Facilities, 21 Fire Stations, 17 Highway Department Shops, 2 Hospitals, 5 Assisted Living Facilities, 6 Police Stations, 30 Schools, 6 Water/Wastewater Facilities
Town of Ashland	1 Highway Department Shop
Town of Baldwin	1 Fire Station, 1 Highway Department Shop

SECTION 8: TORNADO

JURISDICTION	CRITICAL FACILITIES
Town of Big Flats	1 Airport, 2 Fire Stations, 1 Highway Department Shop, 1 Schools
Town of Catlin	1 Fire Station, 1 Highway Department Shop
Town of Chemung	1 Fire Station, 1 Highway Department Shop
City of Elmira	1 911 Communication Center, 2 Correctional Facilities, 3 Fire Stations, 1 Highway Department Shop, 2 Hospitals, 2 Assisted Living Facilities, 2 Police Stations, 11 Schools, 4 Water/Wastewater Facilities
Town of Elmira	2 Fire Stations, 3 Highway Department Shop, 1 Police Station, 6 Schools, 1 Water/Wastewater Facility
Village of Elmira Heights	1 Fire Station, 1 Highway Department Shop, 1 Police Station, 3 Schools
Town of Erin	1 Fire Station, 1 Highway Department Shop
Town of Horseheads	1 Fire Station, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Police Station, 4 Schools
Village of Horseheads	2 Fire Stations, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Police Station, 4 Schools
Village of Millport	1 Fire Station
Town of Southport	1 Correctional Facility, 3 Fire Stations, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Water/Wastewater Facility
Town of Van Etten	1 Fire Station, 1 Highway Department Shop, 1 School
Town of Veteran	1 Fire Station, 1 Highway Department Shop
Village of Wellsburg	1 Highway Department Shop

The average loss estimate of property and crop is \$18,121,644 (in 2018 dollars), having an approximate annual loss estimate of \$510,469 (Table 8-8). Based on historic loss and damages, the impact of tornado on the Chemung County Planning Area, including all participating jurisdictions, can be considered “Limited,” with less than 10 percent of property expected to be destroyed. However, the number of injuries indicates a “Minor” impact.

Table 8-8. Potential Annualized Losses by Jurisdiction, 1983-2018⁹

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Chemung County	\$6,340,423	\$178,603
Town of Ashland	\$0	\$0
Town of Baldwin	\$0	\$0
Town of Big Flats	\$0	\$0
Town of Catlin	\$0	\$0

⁹ Events recorded from January 1983 through June 2018.

SECTION 8: TORNADO

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Chemung	\$144,130	\$4,060
City and Town of Elmira ¹⁰	\$10,981,388	\$309,335
Village of Elmira Heights	\$0	\$0
Town of Erin	\$655,702	\$18,470
Town and Village of Horseheads ¹¹	\$0	\$0
Village of Millport	\$0	\$0
Town of Southport	\$0	\$0
Town of Van Etten	\$0	\$0
Town of Veteran	\$0	\$0
Village of Wellsburg	\$0	\$0
Planning Area Totals	\$18,121,644	\$510,469

ASSESSMENT OF IMPACTS

Tornadoes have the potential to pose a significant risk to the population and can create dangerous situations. Often times, providing and preserving public health and safety is difficult. Impacts to the planning area can include:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Manufactured homes may suffer substantial damage as they would be more vulnerable than typical site-built structures.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- Tornadoes often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.

¹⁰ City and Town of Elmira are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

¹¹ Town and Village of Horseheads are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

SECTION 8: TORNADO

- Extended power outages can result in an increase in structure fires and/or carbon monoxide poisoning as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Tornadoes can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders must enter the damage area shortly after the tornado passes to begin rescue operations and to organize cleanup and assessments efforts, therefore they are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities, loss of communications, and damaged emergency vehicles and equipment.
- City or county departments, municipalities and government services may be damaged or destroyed, delaying response and recovery efforts for the entire community.
- Private sector entities that the participating jurisdictions and their residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- Some businesses not directly damaged by the tornado may be negatively impacted while roads and utilities are being restored, further slowing economic recovery.
- When the community is affected by significant property damage it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Residential structures destroyed by a tornado may not be rebuilt for years, reducing the tax base for the community.
- Large or intense tornadoes may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and/or work outside of the affected area.
- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.
- Recreation activities may be unavailable and tourism can be unappealing for years following a large tornado, devastating directly related local businesses.

The economic and financial impacts of a tornado event on the community will depend on the scale of the event, what is damaged, costs of repair or replacement, lost business days in impacted areas, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by government, businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a tornado event.

SECTION 9: LANDSLIDE

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HAZARD DESCRIPTION

Landslides are defined as the downward movement of a sloped land mass under the force of gravity. Based upon historic information, landslides have occurred in the Chemung County Planning Area on a localized basis. In a landslide, large rock, earth, or debris moves along a downward slope. Mudflow and debris flow are rivers of rock, earth, and other debris that become saturated with water. When water collects in the ground during heavy rains or quick snowmelts, this modifies the earth into flowing rivers of mud in essence creating landslides.



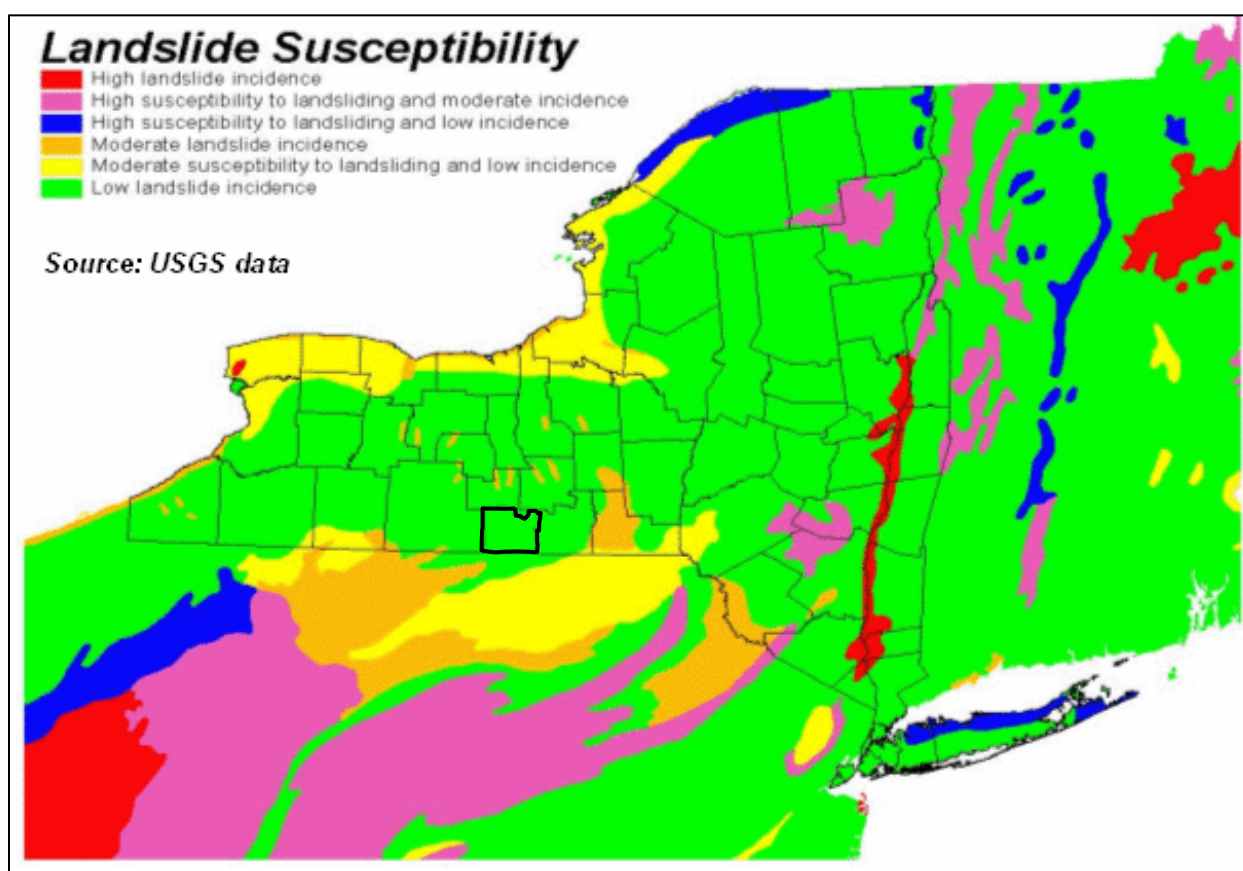
They flow rapidly striking at avalanche speeds that can travel several miles growing in size as they pick up trees, boulders, cars and other materials.

According to the U.S. Geological Survey (USGS), the term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over steepened slope is the primary reason for a landslide, there are other contributing factors. Among the contributing factors are: (1) erosion by rivers, glaciers, or ocean waves which create over steepened slopes; (2) rock and soil slopes weakened through saturation by snowmelt or heavy rains; (3) earthquakes which create stresses making weak slopes fail; and (4) excess weight from rain/snow accumulation, rock/ore stockpiling, waste piles, or man-made structures. Landslide materials may be composed of natural rock, soil, artificial fill, or a combination of these materials. Landslides can transpire quickly oftentimes with little to no warning. Dependent on where they occur, landslides can pose significant risks to health, safety, transportation, as well as other services.

LOCATION

The Chemung County Planning Area has several small areas that exhibit conditions favorable for landslides. The Town of Southport, Town of Veteran, Town of Horseheads, and since 2011 the Town of Van Etten, all have areas prone to landslides. These areas are noted for having steep rocky or forested banks, along streams and creeks and rural roadways, or along the Chemung River. There are currently no other areas within the Chemung County Planning Area that have been identified as being at risk for a landslide. Chemung County is located in an area of the state that is classified as having a low susceptibility for landslides.¹ However, some jurisdictions in the planning area have small areas that exhibit the risk factors. Areas favorable for landslides can be found along major rivers and lake valleys that were formerly occupied by glacial lakes resulting in glacial lake deposits and are usually associated with steeper slopes. Figure 9-1 shows the landslide susceptibility map for the Chemung County Planning Area.

Figure 9-1. Landslide Susceptibility²



EXTENT

To determine the extent of a landslide hazard, the affected areas need to be identified and the probability of the landslide occurring within some time period needs to be assessed. Natural variables that contribute

¹ Source: 2014 New York State All Hazard Mitigation Plan

² Source: USGS. Chemung County Planning Area indicated by black outline.

SECTION 9: LANDSLIDE

to the overall extent of potential landslide activity in any particular area include soil properties, topographic position and slope, and historical incidence. Predicting a landslide is difficult, even under ideal conditions and with reliable information. The landslide hazard is usually represented by landslide incidence and /or susceptibility.

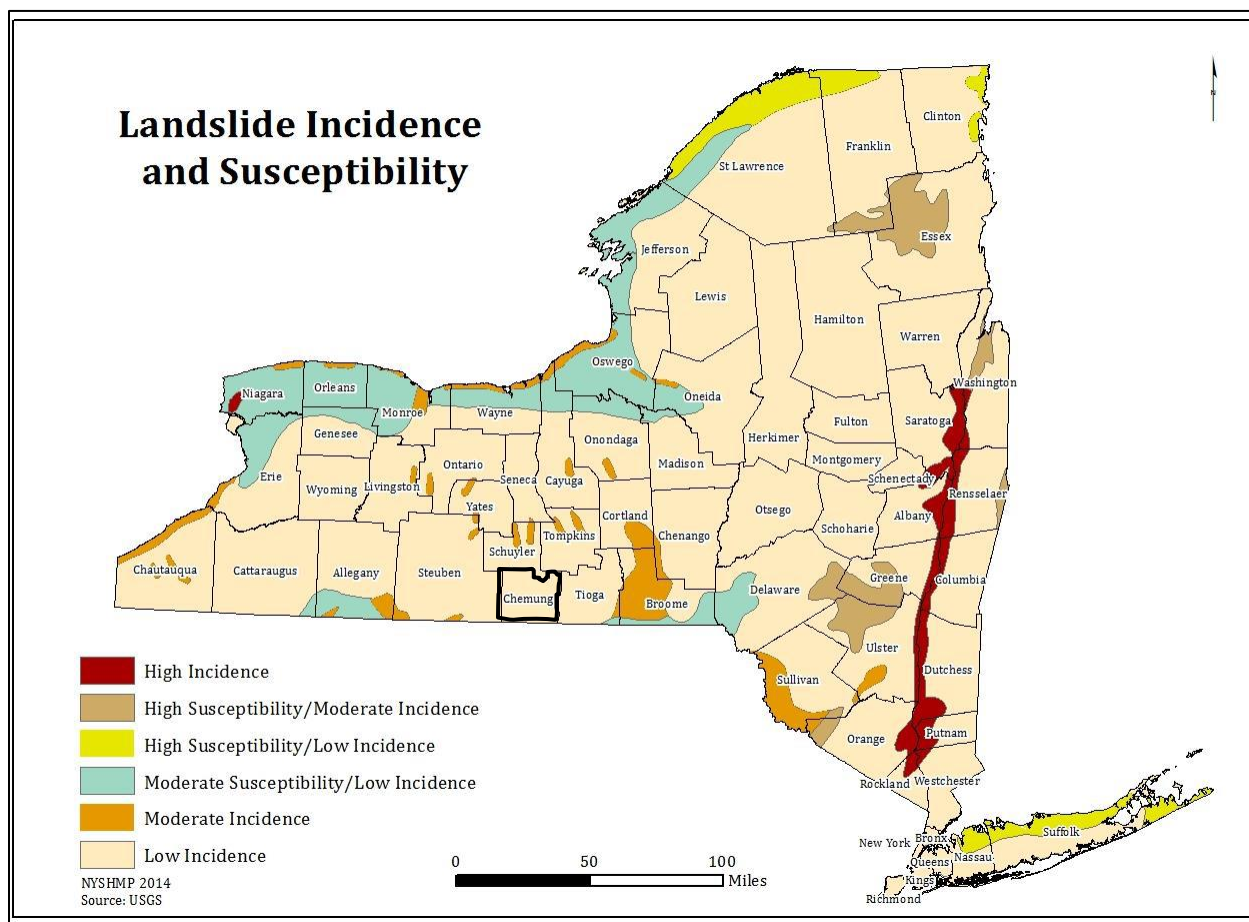
Landslide incidence is the number of landslides that have occurred in a given geographic area. High incidence means greater than 15-percent of the area has experience a landslide; medium incidence means that 1.5 to 15-percent of an area has been involved; and low incidence means that less than 1.5-percent of an area has been involved.

Landslide susceptibility is defined as the degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. It can be assumed that unusually high precipitation or changes in existing conditions can initiate landslides in areas where rocks and soils have experienced numerous landslides in the past. Only potentially affected areas are identified by landslide susceptibility, not a time frame for when a landslide might occur. The same percentages that are used for landslide incidence are used for landslide susceptibility (high= 15+%, medium 1.5-15%, low 0-1.5%).

Landslides incidents within the Chemung County Planning Area are caused by heavy rainfall events which rapidly increase soil moisture. Susceptible areas throughout the planning area include rock cut locations and steep slopes along roadways, steep hillsides, and along creek banks. These locations are not in densely populated areas and have low potential to impact private property. Landslides that occur near streams and result in blocked flow could result in flooding.

Figure 9-2 contains the landslide incidence and susceptibility of New York, identifying areas that have the potential for landslides. These areas are determined by looking at factors that contribute to causing landslides, such as steep slopes, weak geologic areas that lose strength when saturated, and poorly drained rock or soil, with the past distribution of landslides.

According to the New York State Hazard Mitigation Plan, the entire population in the Chemung County Planning Area is at a low risk of incidence and low risk for landslide susceptibility (0-1.5%), as shown in Figure 9-2.

Figure 9-2. Landslide Incidence³

While the planning area may currently experience low incidence of landslides in small, isolated areas, climate change is expected to bring more frequent and significant rainfall events. This is expected to increase the frequency and size of landslide incidents in higher risk areas of the Chemung County Planning Area in the future.

HISTORICAL OCCURRENCES

The New York State Hazard Mitigation Plan indicates no previous landslide events or reported damages due to landslides in the Chemung County Planning Area. However, previous mitigation planning cycles for the county indicate four documented landslides in the planning area (Table 9-1).

³ Source: USGS. Chemung County Planning Area indicated by black outline.

Table 9-1. Historical Landslide Events, 1960-2018⁴

JURISDICTION	NUMBER OF EVENTS	YEAR	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Ashland	0	N/A	N/A	N/A	N/A	N/A
Town of Baldwin	0	N/A	N/A	N/A	N/A	N/A
Town of Big Flats	0	N/A	N/A	N/A	N/A	N/A
Town of Catlin	0	N/A	N/A	N/A	N/A	N/A
Town of Chemung	0	N/A	N/A	N/A	N/A	N/A
City & Town of Elmira ⁵	0	N/A	N/A	N/A	N/A	N/A
Village of Elmira Heights	0	N/A	N/A	N/A	N/A	N/A
Town of Erin	0	N/A	N/A	N/A	N/A	N/A
Town of Horseheads	1	Unknown/ Ongoing	0	0	\$0	\$0
Village of Horseheads	0	N/A	N/A	N/A	N/A	N/A
Village of Millport	0	N/A	N/A	N/A	N/A	N/A
Town of Southport	1	Unknown/ Ongoing	0	0	\$0	\$0
Town of Van Etten	1	2011	0	0	\$0	\$0
Town of Veteran	2	1994	0	0	\$0	\$0
Village of Wellsburg	0	N/A	N/A	N/A	N/A	N/A
TOTAL LOSSES	5		0	0	\$0	

SIGNIFICANT EVENTS

1994- Town of Veteran

A steep hillside failed in the Town of Veteran causing a landslide that covered a road but did not damage any homes. There was concern that the landslide would continue into Catharine Creek and cause flooding in the Village of Millport. The Town chose to abandon the affected section of road, rather than remove the deposited material.

⁴ Damages are reported from January 1960 through June 2018.

⁵ City and Town of Elmira are not listed separately in the NCEI. For the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

SECTION 9: LANDSLIDE

May 2011- Town of Van Etten

Heavy rain in the Town of Van Etten caused a landslide along a feeder creek to Cayuta Creek, on Crammer Hollow Road. The landslide forced the rushing water out of its banks and caused severe erosion and damage to the yard of a residence that borders the creek. The septic system of the residence is now at risk for failure and will undoubtedly be damaged in the next high-water event. The slope shows signs of further cracking, and another landslide in this area is certain to occur in the next large storm, if not before.

PROBABILITY OF FUTURE EVENTS

Based on available records of historic events, 5 known historic events in a 59-year reporting period for the Chemung County Planning Area provides a probability of one event every ten years. This frequency supports an unlikely probability of future events for the Chemung County Planning Area, including all participating jurisdictions.

The majority of landslide incidents within Chemung County Planning Area are spurred by heavy rainfall events. These heavy rainfall events are expected to increase in the future, mostly in areas that have historically documented bank failures or slope subsidence. Annual average precipitation in the state is projected to increase by 5 to 10 percent by 2080. With this the frequency of landslides to occur in the planning area will likely increase. In addition, climate models also project that the frequency of heavy rainfall events will increase. These predicted changes in weather patterns are likely to result in an increase in the frequency of landslides, potentially with greater levels of property damage.

VULNERABILITY AND IMPACT

Dependent on where they occur, landslides can pose significant risks to health, safety, transportation, and other services. The magnitude of the landslide, measured in geographic area (acres) as well as tonnage of material displaced, coupled with location would determine the severity of the incident.

In general, landslides within the Chemung County Planning Area have occurred in low-populated areas and most have not caused significant damage to private property. However, significant damage to public infrastructure could occur as the number and size of landslides increase. Historical damages resulting from landslides have been minimal throughout the planning area. Areas at greater risk may experience

According to the New York State Hazard Mitigation Plan, the entire population in the Chemung County Planning Area is at a low risk of incidence, as shown in Figure 9-2 above.

The following critical facilities would be vulnerable to landslides in the planning area by jurisdiction.

Table 9-2. Critical Facilities by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Chemung County	No Known
Town of Ashland	No Known
Town of Baldwin	No Known
Town of Big Flats	No Known

SECTION 9: LANDSLIDE

JURISDICTION	CRITICAL FACILITIES
Town of Catlin	No Known
Town of Chemung	No Known
City of Elmira	No Known
Town of Elmira	No Known
Village of Elmira Heights	No Known
Town of Erin	No Known
Town of Horseheads	No Known
Village of Horseheads	No Known
Village of Millport	No Known
Town of Southport	No Known
Town of Van Etten	No Known
Town of Veteran	No Known
Village of Wellsburg	No Known

The impact of landslides ranges from a minor nuisance to significant structural damage. The Chemung County Planning Area is at low risk for landslides. Future vulnerability is not expected to be substantial but could be significant if roadways and/or structures are impacted. The impact of landslides experienced in the Chemung County Planning Area has resulted in no injuries and fatalities, supporting a limited severity of impact meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10 percent of property is destroyed or with major damage.

SECTION 10: MITIGATION STRATEGY

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Goal 2	1
Goal 3	2
Goal 4	2
Goal 5	3
Goal 6	3

MITIGATION GOALS

Based on the results of the risk and capability assessments, the Planning Team developed and prioritized the mitigation strategy. At the Mitigation Workshop in October 2018, Planning Team members refined the Plan's mitigation strategy. The following goals and objectives were identified.

GOAL 1

Protect public health and safety.

OBJECTIVE 1.1

Advise the public about health and safety precautions to guard against injury and loss of life from hazards.

OBJECTIVE 1.2

Maximize utilization of the latest technology to provide adequate warning, communication, and mitigation of hazard events.

OBJECTIVE 1.3

Reduce the danger to, and enhance protection of, high risk areas during hazard events.

OBJECTIVE 1.4

Protect critical facilities and services.

GOAL 2

Build and support local capacity and commitment to continuously become less vulnerable to hazards.

OBJECTIVE 2.1

Build and support local partnerships to continuously become less vulnerable to hazards.

SECTION 10: MITIGATION STRATEGY

OBJECTIVE 2.2

Build a cadre of committed volunteers to safeguard the community before, during, and after a disaster.

OBJECTIVE 2.3

Build hazard mitigation concerns into county planning and budgeting processes.

GOAL 3

Increase public understanding, support, and demand for hazard mitigation.

OBJECTIVE 3.1

Heighten public awareness regarding the full range of natural and man-made hazards the public may face.

OBJECTIVE 3.2

Educate the public on actions they can take to prevent or reduce the loss of life or property from all hazards and increase individual efforts to respond to potential hazards.



OBJECTIVE 3.3

Publicize and encourage the adoption of appropriate hazard mitigation measures.

GOAL 4

Protect new and existing properties.

OBJECTIVE 4.1

Reduce repetitive losses to the National Flood Insurance Program (NFIP).

OBJECTIVE 4.2

Use the most cost-effective approach to protect existing buildings and public infrastructure from hazards.

OBJECTIVE 4.3

Enact and enforce regulatory measures to ensure that future development will not put people in harm's way or increase threats to existing properties.

SECTION 10: MITIGATION STRATEGY

GOAL 5

Maximize the resources for investment in hazard mitigation.

OBJECTIVE 5.1

Maximize the use of outside sources of funding.

OBJECTIVE 5.2

Maximize participation of property owners in protecting their properties.

OBJECTIVE 5.3

Maximize insurance coverage to provide financial protection against hazard events.

OBJECTIVE 5.4

Prioritize mitigation projects based on cost-effectiveness and sites facing the greatest threat to life, health, and property.

GOAL 6

Promote growth in a sustainable manner.

OBJECTIVE 6.1

Incorporate hazard mitigation activities into long-range planning and development activities.

OBJECTIVE 6.2

Promote beneficial uses of hazardous areas while expanding open space and recreational opportunities.

OBJECTIVE 6.3

Utilize regulatory approaches to prevent creation of future hazards to life and property.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

Summary	1
Chemung County	2
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Town of Baldwin	6
Town of Big Flats.....	7
Town of Catlin	8
Town of Chemung.....	9
City of Elmira	10
Town of Elmira	12
Village of Elmira Heights	13
Town of Erin	14
Town of Horseheads	15
Village of Horseheads	17
Town of Southport.....	18
Town of Van Etten.....	19
Town of Veteran and Village of Millport	20

SUMMARY

Planning Team members were given copies of the previous mitigation actions submitted in the 2012 Plan at the mitigation workshop. Representatives from participating jurisdictions within Chemung County reviewed the previous actions and provided an analysis as to whether the action had been completed, should be deferred as an ongoing activity, or be deleted from the Plan Update. The actions from the 2012 Plan are included in this section as they were written in 2012.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

CHEMUNG COUNTY

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms.	Cost	Staff time, materials and contractor time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Mallory Hill, Dry Brook, Christian Hollow, River Road, Hillcrest projects are complete. Action will be included in the Plan Update.
Flood - 10	Conduct Regular Maintenance for Drainage System	Flood	Complete various construction and maintenance projects and create a schedule for ongoing maintenance of completed projects. 1. stormwater system enlargement project on Coleman Ave, to prevent flooding, joint project with T/Elmira.	Cost	Staff time
				Level of Protection	10-year storm
				Damages Avoided; Evidence of Success	Project 1 close to completion.
Flood - 15	Additional Floodplain Management Activities	Flood	Municipalities will work with STC, EMO and other agencies to improve CRS credits and increase CRS ratings to provide residents with better rates for NFIP. Code Enf. Officer took E-278- NFIP/CRS course at NYS Fire Academy.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	The following communities maintained CRS classification: Town of Big Flats, Town of Horseheads, Village of Horseheads, City of Elmira, Town of Southport, Town of Ashland, Village of Wellsburg, and Town of Chemung. Town of Elmira withdrew from the program. Action will be included in the Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 19	Improve Drainage System	Flood	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.	Cost	Up to \$2,000 annually per municipality
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in the Plan Update.
Summer Storm and Winter Storms-1	Protect Critical Facilities	Summer and Winter Storms	Install generator to run gas pumps, admin and shop bldgs., heat and radio bases.	Cost	\$300,000
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project completed.
Summer Storm and Winter Storms-2	Protect Infrastructure	Summer and Winter Storms	Purchase Tree Truck to help institute a tree trimming program to prevent future damage to infrastructure and utilities, plus staff and training. Tree truck has been purchased.	Cost	Staff time and truck
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project completed.
Winter Storms-1	Protect Infrastructure	Winter Storms	Create a cooperative tree maintenance program among the municipalities and NYSEG and bury utilities when feasible.	Cost	\$0
				Level of Protection	NA
				Damages Avoided; Evidence of Success	NYSEG performs tree maintenance around their utilities. County employees are not allowed to perform the maintenance. This project is no longer necessary. Action will be deleted.
Landslide-1	Protect Infrastructure	Landslide	Install sheet piling for Chambers Rd, and Christian Hollow Rd. Chambers Rd is completed.	Cost	Staff time, materials and equipment
				Level of Protection	10-year storm
				Damages Avoided; Evidence of Success	Chambers Road is completed. Christian Hollow Road is partially completed. Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

TOWN OF ASHLAND AND VILLAGE OF WELLSBURG

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Removal of gravel in Bentley Creek deposited by 2011 storms. If PL-566 is approved, will incorporate debris removal and maintenance. But must remove gravel now before next high water, estimated cost, \$500K- \$1 Mill 2. Ashland Town line to first bridge on Maple Ave. 3. Maple Ave bridge to Chemung River.	Cost	\$300,000
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project 1 is complete. Project 2 and 3 were deemed to be unnecessary. Action will be deleted.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in Floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Home owner funding
				Level of Protection	100-year storm
				Damages Avoided; Evidence of Success	1 house elevated. Funding not pursued for additional buyouts. Action will be deleted.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the stormwater Coalition for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in the Plan Update.
Flood -10	Improve Drainage Systems	Flood	Complete various construction and maintenance projects and create a schedule for ongoing maintenance of completed projects. 1. Robinson Rd- install larger capacity box culvert, remove current smaller metal pipe 2. Install rip-rap in several areas to armor banks, both Tyler Run and Bentley Creek.	Cost	Staff time, materials and equipment
				Level of Protection	10-year storm
				Damages Avoided; Evidence of Success	Project 1 is complete. Project 2- Bentley Creek is complete, Tyler Run is not. Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood -12	Relocate Fire Department Building	Flood	Assist the Wellsburg Volunteer Fire Department in finding a new location. Town and Village working cooperatively to secure grant funding and purchase land. Have land identified and plan for fill to ensure facility has 2 ft. freeboard.	Cost	\$2.5 Million
				Level of Protection	100-year storm
				Damages Avoided; Evidence of Success	Project complete.
Flood -14	Educate Property Owners	Flood	Promote the use of flood proofing techniques for retrofitting existing flood-prone development by distributing educational materials. Code Enf/Fldpln Admins have taken a continuing education course, and have educational packets created by Chemung County and STC with Mitigation Grant funds. Flood proofing info packets were distributed to residents after TS Lee, and presentation made at Village mtg. for residents.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Materials have been made available on the County website and brochures are provided for annual mailings to residence. Project is county wide. Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

TOWN OF BALDWIN

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Baldwin Creek, Wyncoop Creek, Chapman Road Creek, Tut Hill Ridge, Federal Road, Elston Hollow, Grover Road projects were completed. Other locations have not been completed. Action will be included in Plan Update.
Flood-11a	Improve Drainage System	Flood	Upgrade all dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project is partially completed. Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

TOWN OF BIG FLATS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. Stabilization Projects 1. Upson Rd 2. Owen Hollow 3. Monastary Rd 4. Sing Sing Rd 5. Upper Hoffman Brk Also, detention basin project at Jackson Farm.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Projects 1,2,3,4 complete. Jackson Farm is not completed. Action will be included in Plan Update.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Funding not secured. Action will be included in Plan Update.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the Stormwater Coalition and STC for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Changes were made to zoning restrictions for new developments within much of the Chemung River Floodplain. Action will be included in Plan Update.
Flood -15	Additional Floodplain Management Activities	Flood	Municipalities will work with STC, EMO and other agencies to improve CRS credits and increase CRS ratings to provide residents with better rates for NFIP. Code Enf Officer took E-278- NFIP/CRS course at NYS Fire Academy.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Maintained CRS Class 8. Current code enforcement staff have taken floodplain management training. Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

TOWN OF CATLIN

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Post Creek from Schuyler line to Steuben line 2. Backer Rd Rt. 414 upstream 2000 feet.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project 2 is complete. Project 1 is unnecessary. Action will be deleted.
Flood-11a	Improve Drainage System	Flood	Upgrade all dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project is partially completed. Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

TOWN OF CHEMUNG

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Mallory Rd, Wyncoop Creek Rd to first bridge 2. Mallory Rd, first bridge to second bridge.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	All are complete.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Funding not secured. Action will be included in Plan Update.
Flood-11a	Improve Drainage System	Flood	Upgrade all dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project is partially completed. Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

CITY OF ELMIRA

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood-3a	Educate on Flood Mitigation Techniques	Flood	Created public education programs, in cooperation with local organizations, regarding yard waste and debris in and near streams and drainage ways, including clearing storm drains to prevent urban flooding. In addition, the City of Elmira would like to create a program that would allow residents to put grass/leaves out year around in paper bags so that they can be composted at the City's compost facility. City no longer owns facility, county opened county wide facility used by all residents.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Stream bank erosion, localized flooding, and reduce plugging in culverts. Project is completed. County wide over 9000 residents used this facility in 2018.
Flood-9	Floodplain Management	Flood	Provide technical assistance through STC for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.
Flood-10	Conduct Regular Maintenance for Drainage System	Flood	Complete various construction and maintenance projects and create a schedule for ongoing maintenance of completed projects. 1. Storm Drain improvements to lower Hoffman St @ Gray St to prevent flooding of Hoffman St businesses. Study has been completed. 2. Joint project with T/Elmira to complete flood control project, Fassett Rd and Hoffman St, study is complete.	Cost	Staff time, materials and equipment
				Level of Protection	10-year storm
				Damages Avoided; Evidence of Success	Ensuring life safety during events. Action will be included in Plan Update.
Flood-17	Educate on Flood Evacuation Routes	Flood	Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). All but City of Elmira need study and planning. Study is complete and plan is on paper but need funding to implement. Routes are in place.	Cost	\$347,000
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Ensuring life safety during events. Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood-19	Improve Drainage System	Flood	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.	Cost	up to \$2,000 annually
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

TOWN OF ELMIRA

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Upper Larchmont Detention Basin reclassification to high haz, new spillway project 2. Stabilization on Goldsmith and Baldwin Crks 3. Goldsmith Crk Draht Hill bridge to Jerusalem Hill Rd.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project 2 and 3 are complete. Project 1 is not complete. Action will be included in Plan Update.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Funding not secured. Action will be included in Plan Update.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the Stormwater Coalition and STC for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.
Flood -10	Conduct Regular Maintenance for Drainage System	Flood	Complete various construction and maintenance projects and create a schedule for ongoing maintenance of completed projects. 1. Stormwater system upgrade on Coleman Ave, to prevent flooding, joint project with Chemung County. 2. Joint project with C/Elmira to complete flood control project, Fassett Rd and Hoffman St, study is complete.	Cost	Staff time, materials and equipment
				Level of Protection	10-year storm
				Damages Avoided; Evidence of Success	Project 1 close to completion. Project 2 not funded and incomplete. Action will be included in Plan Update.
Flood -19	Improve Drainage System	Flood	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.	Cost	Up to \$2,000 annually
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

VILLAGE OF ELMIRA HEIGHTS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood-9	Floodplain Management	Flood	Provide technical assistance through the stormwater Coalition and STC for more effective municipal legislation regarding land use, zoning laws, Stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.
Flood-13	Protect Infrastructure	Flood	Investigate funding sources to complete proposed drainage control projects in the Village of Elmira Heights, and investigate possible alternatives or improvements to current system, such as installing an automated system for existing manual pumps.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Rehabilitated pumps. Still pursuing upgrading. Action will be included in Plan Update.
Flood -19	Improve Drainage System	Flood	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.	Cost	Up to \$2,000 annually
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

TOWN OF ERIN

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Diversion swale to protect Fire Dept. 2. T/Erin line to Rt. 223 bridge in Erin Hamlet 3. Erin Hamlet upstream to first bridge.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Projects 1 and 2 are complete. Project 3 is unnecessary. Action will be deleted.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Funding not secured. Action will be included in Plan Update.
Flood-11a	Improve Drainage System	Flood	Upgrade all dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project is partially completed. Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

TOWN OF HORSEHEADS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Bannister Rd culvert project 2. Vargo Rd creek stabilization 3. Bowman Hill Terrace stream stabilization 4. Crane Rd stabilization project 5. Rt. 13 upstream to East Franklin St 6. East Franklin St to Orminston Rd 7. Orminston Rd to T/Erin line.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	All projects are complete.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the Stormwater Coalition and STC for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.
Flood-14	Educate on Flood Mitigation Techniques	Flood	Promote the use of flood proofing techniques for retrofitting existing flood-prone development by distributing educational materials. Code Enf/Fldpln Admins have taken a continuing education course, and have educational packets created by Chemung County and STC with Mitigation Grant funds. Code Enf Officer attended week long course at EMI and was a creator/instructor of the local course.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Materials have been made available on the County website and brochures are provided for annual mailings to residence. Project is county wide.
Flood -15	Additional Floodplain Management Activities	Flood	Municipalities will work with STC, EMO and other agencies to improve CRS credits and increase CRS ratings to provide residents with better rates for NFIP. Code Enf Officer took E-278- NFIP/CRS course at NYS Fire Academy.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Maintained CRS rating 9. Code enforcement office has taken additional flood train management training. Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
				Cost	Up to \$2,000 annually
Flood -19	Improve Drainage System	Flood	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.	Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

VILLAGE OF HORSEHEADS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood-17	Floodplain Management	Flood	Provide technical assistance through the stormwater Coalition and STC for more effective municipal legislation regarding land use, zoning laws, Stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project is complete.
Flood-18	Protect Critical Facilities	Flood	Reline stormwater sewer in Village of Horseheads, running from HHDS FD to New Town Creek.	Cost	> \$1 Million
				Level of Protection	10 Year storm event
				Damages Avoided; Evidence of Success	Initial planning was completed. Grant proposal declined. Project not funded and incomplete. Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

TOWN OF SOUTHPORT

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood-1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Wetland creation projects, at least 2 projects on private properties 2. Pa border to first bridge at Rt. 328 3. Rt. 328 bridge to Penn Ave bridge 4. Penn Ave bridge to Rt. 14 bridge 5. Rt. 14 bridge to T/Ashland line.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project 1, 4 and 5 are complete. Project 2 and 3 are not complete. Action will be included in Plan Update.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in Floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Funding not secured. Action will be included in Plan Update.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the Stormwater Coalition and STC for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Updated zoning law includes a Conservation Zone that prohibits new buildings in the floodway, stream protections in Riparian Buffer, and Setback Areas along all perennial streams. Project is ongoing.
Flood-14	Educate on Flood Mitigation Techniques	Flood	Promote the use of flood proofing techniques for retrofitting existing flood-prone development by distributing educational materials. Code Enf/Fldpln Admins have taken a continuing education course, and have educational packets created by Chemung County and STC with Mitigation Grant funds.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Materials have been made available on the County website and brochures are provided for annual mailings to residence. Project is county wide.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

TOWN OF VAN ETTEN AND VILLAGE OF VAN ETTEN

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood-1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Beckhorn Hollow, Langford Creek projects were completed. Other areas are not complete. Action will be included in Plan Update.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Funding not secured. Action will be included in Plan Update.

SECTION 11: PAST MITIGATION ACCOMPLISHMENTS

TOWN OF VETERAN AND VILLAGE OF MILLPORT

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Pantherlick is partially completed. Catherine Creek and Sleeper Run projects were completed. 3 floodplain houses were bought out on Catherine Creek. Action will be included in Plan Update.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the Stormwater Coalition for more effective municipal legislation regarding land use, zoning laws, Stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Updated the Comprehensive Plan. Updates to land use regulations are in progress and include many changes to improve stormwater management and flood risk reduction. Action will be included in Plan Update.
Flood-11b	Protect Infrastructure	Flood	Upgrade Dann Blvd to at least oil and stone and install proper drainage structures to prevent future flood damage and ensure Fire/Police/EMS direct route to residents during emergency response will not be blocked, causing lengthy detour.	Cost	Grant
				Level of Protection	10 Years
				Damages Avoided; Evidence of Success	Project complete.

SECTION 12: MITIGATION ACTIONS

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SUMMARY

As discussed in Section 2, at the mitigation workshop the planning team and stakeholders met to develop mitigation actions for each of the natural hazards included in the Plan. Each of the actions in this section were prioritized based on FEMA’s Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) criteria necessary for the implementation of each action. As a result of this exercise, an overall priority was assigned to each mitigation action.

As part of the economic evaluation of the STAPLEE analysis, jurisdictions analyzed each action in terms of the overall costs, measuring whether the potential benefit to be gained from the action outweighed costs associated with it. As a result of this exercise, priority was assigned to each mitigation action by marking them as High (H), Moderate (M), or Low (L). An action that is ranked as “High” indicates that the action will be implemented as soon as funding is received. A “Moderate” action is one that may not be implemented right away depending on the cost and number of citizens served by the action. Actions ranked as “Low” indicate that they will not be implemented without first seeking grant funding and after “High” and “Moderate” actions have been completed.

All mitigation actions created by Planning Team members are presented in this section in the form of Mitigation Action Worksheets. More than one hazard is sometimes listed for an action, if appropriate.

SECTION 12: MITIGATION ACTIONS

Actions presented in this section represent a comprehensive range of mitigation actions per current State and FEMA Guidelines, including two actions, per jurisdiction.

Table 12-1. Chemung County and Participating Jurisdictions Mitigation Action Matrix

TYPE OF ACTION:					
Action #1 – Plans/Regulations (Blue)					
Action #2 - Education/Awareness (Red)					
Action #3 - Natural Resource (Green)					
Action #4 - Structural (Orange)					
Action #5 – Preparedness/Response (Black)					

Jurisdiction	Flood	Landslide	Winter Storm	Tornado	Thunderstorm
Chemung County	xxxxxx xxxx	x	x	x	x
City of Elmira	xxxxxx	N/A	x	x	x
Town of Ashland	xxxxxx	N/A	xx	xx	x
Town of Baldwin	xxxxxx	N/A	x	x	x
Town of Big Flats	xxxxxx xxx	N/A	x	x	x
Town of Catlin	xxxx	N/A	x	x	x
Town of Chemung	xxxxxx	N/A	x	x	x
Town of Elmira	xxxxxx xx	N/A	x	x	x
Town of Erin	xxxxxx	N/A	x	x	x
Town of Horseheads	xxxxxx	x	x	x	x
Town of Southport	xxxxxx	x	xx	xx	xx
Town of Van Etten	xxxx	x	x	x	x
Town of Veteran	xxxxxx	xx	xx	x	x
Village of Elmira Heights	xxxxxx	N/A	x	x	x
Village of Horseheads	xxx	N/A	xx	xx	xx
Village of Millport	xxxxxx	N/A	xx	xx	xx
Village of Wellsburg	xxxxxx	N/A	x	x	x

SECTION 12: MITIGATION ACTIONS

CHEMUNG COUNTY

Ditch Stabilization Program		Chemung County – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Roadside ditches along steeper roadways are prone to significant erosion, as the result of extreme rainfall events. During these events, peak stormwater flows generate high flow velocities in the roadside ditches, resulting in significant erosion and deepening of the ditches, including damage to the roadway shoulders and roadway pavement. This damage presents increased hazards for motorists.		
Action or Project Intended for Implementation			
Description of the Solution	The Chemung County Soil & Water District has a current program to repair and stabilize roadside ditches that have become eroded. This program will be expanded and implemented, to prevent the damage to ditches and reduce associated hazards.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10-year Storm Event (min.)	Estimated Benefits (losses avoided)	Expansion and implementation of this program would result in prompt repairs to damaged ditches and roadways; improved safety for motorists; and reduced sediment reaching waterbodies.
Useful Life	25 years		
Estimated Cost	Dependent upon extent of damage		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Flood damages will continue
	Concrete lined roadside ditches	\$25,000,000	Not cost beneficial
	Upgrade drainage system to provide 25-year level of protection	\$50,000,000	Not cost-beneficial; May not be feasible in all areas
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Stream Stabilization Program		Chemung County – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Extreme rainfall events result in high stormwater flow rates, which result in the destabilization of stream channels (including streambanks), that causes erosion and deposition within these streams, as well as stream migration. The erosion of streambanks and migration of stream channels can jeopardize adjacent buildings, bridges, culverts, roadways, utilities, and other infrastructure.		
Action or Project Intended for Implementation			
Description of the Solution	The Chemung County Soil & Water District has a current program to stabilize streams and streambanks. This program will be expanded and implemented, to correct destabilized and migrated streams that pose risks to existing infrastructure.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year Storm Event (min.)	Estimated Benefits (losses avoided)	Expansion and implementation of this program would result in prompt repairs to destabilized streams; improved protection for adjacent infrastructure; improved safety for motorists; and reduced sediment reaching waterbodies.
Useful Life	50 years		
Estimated Cost	Dependent upon stream and extent of damage		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Flood damages will continue
	Install retention/detention ponds to reduce impact to streams during heavy rain events.	Dependent on size, location and number of ponds required to lessen stream impacts	Less cost beneficial; Potential environmental impacts
	Proposed action	Dependent upon stream and extent of damage	Considered the best alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Stormwater Detention Basin Program		Chemung County – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Extreme rainfall events result in high stormwater flow rates, which can result in damage to downstream infrastructure and also result in the destabilization of stream channels (including streambanks), that causes erosion and deposition within these streams, as well as stream migration. The erosion of streambanks and migration of stream channels can jeopardize existing infrastructure, including roads, bridges, and buildings.		
Action or Project Intended for Implementation			
Description of the Solution	The Chemung County Soil & Water District has a current program to design and construct stormwater detention basins. This program will be expanded and implemented, to install stormwater detention basins to reduce peak flow rates reaching downstream areas.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year Storm Event (min.)	Estimated Benefits (losses avoided)	Expansion and implementation of this program would result in prompt design and construction of stormwater detention basins with the goal of reducing peak stormwater flow rates to downstream areas.
Useful Life	50 years		
Estimated Cost	Dependent upon detention size, number and locations		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Flood damages will continue
	Widening and stabilization of stream channels and banks	\$50,000,000(est)	Not feasible in all locations; not cost beneficial; potential environmental concerns
	Proposed project	Dependent on size, location and number of detention basins	Considered cost effective; environmentally sound; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Stormwater Debris Basin Program		Chemung County – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Extreme rainfall and snowmelt events result in high stormwater flow rates, which can result in significant amounts of debris (including sediment, rubble, and woody debris) being mobilized and directed to downstream portions of drainage courses. The build-up of debris can compromise the performance of bridges and culverts, jeopardizing these installations (as well as the associated roadways).		
Action or Project Intended for Implementation			
Description of the Solution	The Chemung County Soil & Water District has a current program to design and construct stormwater debris basins. This program will be expanded and implemented to install stormwater debris basins to trap and control storm debris in designated locations.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year Storm Event (min.)	Estimated Benefits (losses avoided)	Implementation/expansion of this program would result in prompt design and construction of stormwater debris basins with the goal of capturing/controlling stormwater debris to protect downstream drainage structures.
Useful Life	50 years		
Estimated Cost	Dependent upon size of detention basin and associated site		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Damages will continue during each storm event, requiring emergency response and repetitive repair
	Installation of flexible debris barriers	Dependent on the size and number required to effectively mitigate the risk	Potentially less cost effective; Proven to be ineffective mitigation in some locations so may not be feasibly sound
	Proposed project	Dependent on size, location and number of debris basins	Considered cost effective; environmentally sound; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Stream Debris Maintenance Program		Chemung County – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Extreme rainfall and snowmelt events result in high stormwater flow rates, which can result in significant amounts of debris (including sediment, rubble, and woody debris) being mobilized and directed to downstream portions of streams. The build-up of debris can compromise the performance of downstream bridges and culverts, jeopardizing these installations (as well as the associated roadways).		
Action or Project Intended for Implementation			
Description of the Solution	The Chemung County Soil & Water District has a current stream debris maintenance program. This program will be expanded and implemented, to remove stream debris after a flooding event. *This is considered to be a response/recovery project but was included in the plan as a priority of the county.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year Storm Event (min.)	Estimated Benefits (losses avoided)	Implementation/expansion of this program would result in prompt removal of stream debris after a flooding event with the goal of removing this stormwater debris to protect downstream drainage structures.
Useful Life	50 years		
Estimated Cost	Dependent upon size of detention basin and associated site		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Response/Recovery Action		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Chemung County – 6	
Risk/Vulnerability			
Hazard of Concern	Winter Storm, Thunderstorm, Flood, Tornado, Landslide		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, websites, direct mailing, individual assistance, etc. Promote the use of mitigation measures including floodproofing techniques for retrofitting existing development. Materials will include life and safety tips for all hazards, minimum mitigation measures to reduce property losses during extreme events, as well as Emergency Evacuation Routes. Materials have been made available on the County website and brochures are provided for annual mailings to residence.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$10,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Chemung County EMO & Environmental Emergency Services	Local Planning Mechanisms to be Used in Implementation, if any	Flood Education Plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$10,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Improve CRS Ratings		Chemung County – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Municipalities will work with STC, EMO and other agencies to improve CRS credits and increase CRS ratings to provide residents with better rates for NFIP.		
Action or Project Intended for Implementation			
Description of the Solution	County EMO, County Planning, STC and other agencies will assist participating municipalities with identifying additional activities and gathering documentation to improve CRS classifications, while also facilitating a comprehensive approach to floodplain management.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Attaining this goal would ensure better NFIP rates for residents and improve floodplain management.
Useful Life	NA		
Estimated Cost	\$10,000/year		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grant funding, Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District, STC	Local Planning Mechanisms to be Used in Implementation, if any	Municipal Comprehensive Plans
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	Staff time	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Maintenance on the Old Chemung Canal Project		Chemung County – 8	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Chemung Canal joined the Chemung River, extending northward linking the river to the Erie Canal via Seneca Lake. The canal paralleled the Chemung River for long sections, sharing part of its water and drainage basin, by building dams and locks. The Canal is no longer in use, but the remains are still in place. This area becomes paralyzed by the regional rains and flooding requiring maintenance.		
Action or Project Intended for Implementation			
Description of the Solution	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm	Estimated Benefits (losses avoided)	Continued maintenance of this program would result in reduction of flood damages
Useful Life	50 years		
Estimated Cost	\$2,000 per municipality		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Increases in debris and sediment will increase flood depths and damages
	Complete removal of the canal remnants and alternative drainage mitigation	\$50,000,000	Not cost effective; Significant Environmental concerns
	Proposed Project	\$2,000 per municipality	Cost effective; reduces future flood damages
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Install Sheet Piling for Christian Hollow Road		Chemung County – 9	
Risk/Vulnerability			
Hazard of Concern	Landslide		
Description of the Problem	Roadside ditches along steeper roadways are prone to significant erosion as a result of extreme rainfall events. Installation of sheet piling on Christian Hollow Road will improve the stability of the road reducing potential hazards for motorists.		
Action or Project Intended for Implementation			
Description of the Solution	Sheet piling would be installed on Christian Hollow Road.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm event (approx.)	Estimated Benefits (losses avoided)	Continued maintenance of this program would result in increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$175,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grants and Local funding sources
Responsible Organization	Chemung County	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages to roadway will continue; Emergency services will continue to be required during events
	Concrete lined ditches	\$2,500,000	Not cost effective; May not be environmentally sound
	Proposed Action	\$175,000	Feasible and Cost effective
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Drainage System Improvements		Chemung County – 10	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Inadequate drainage systems along Coleman Avenue, Fassett Road and Hoffman Street cause flooding, damages to roadways, and create hazardous driving conditions for motorists.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade the stormwater system on Coleman Avenue, Fassett Road and Hoffman Street to prevent flooding.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10 yr. storm	Estimated Benefits (losses avoided)	Improved reliability for roadway; Improved safety for motorists.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grants
Responsible Organization	Chemung County	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	Staff time	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Resilient Land Use Management		Chemung County – 11	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Existing land use regulations establish minimum standards for new development and substantial improvements in mapped floodplains, but do not prevent development in the highest risk areas or provide protection in areas with un-mapped flood risks.		
Action or Project Intended for Implementation			
Description of the Solution	The County Planning Department and STC will provide technical and planning assistance to help municipalities improve integration of flood safety into municipal comprehensive planning and land use regulations. Promote improved safety and reduced damage potential by preventing/minimizing development in the highest risk areas, protecting natural systems that reduce flood potential, and increasing flood protection standards for development in flood-prone areas (in and outside of mapped floodplains).		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Prevent/minimize future development that is vulnerable to flooding or can adversely affect flood risks for others.
Useful Life	NA		
Estimated Cost	\$30,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grant funding, Local funding sources
Responsible Organization	County Planning Department & STC	Local Planning Mechanisms to be Used in Implementation, if any	Municipal Comprehensive Plans
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination & technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Facilitate Implementation of Automated Rain Gauges and Stream Gauges		Chemung County – 12	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	When heavy rain occurs in Chemung County or in uphill / upstream areas, it can result in unexpected flash flooding in developed areas of the County. Highway crews and emergency personnel lack the warning time needed to mobilize for timely road closings, debris removal, notifying residents, and other emergency operations.		
Action or Project Intended for Implementation			
Description of the Solution	Work with municipalities throughout the County to facilitate the purchase and installation of automated rain gauges and stream gauges. This gauge system would provide access to real-time data to alert county and municipal personnel to heavy rainfall and/or high stream flows. Provide training for municipal use of gauge data. Coordinate with surrounding Counties that are within the watersheds that drain into Chemung County to obtain data from any of their gauges.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10-year storm	Estimated Benefits (losses avoided)	Advanced warning of potential flooding would allow mobilization of emergency personnel and warning of residents, enabling improved safety and reduced property damages.
Useful Life	25 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	1 year
Estimated Time Required for Project Implementation	5 years	Potential Funding Sources	Grant funding, Local funding source
Responsible Organization	County EMO and EES	Local Planning Mechanisms to be Used in Implementation, if any	County Work Plan and EES Work Plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Limited warning of flash flooding. Limited situational awareness for emergency personnel.
	Provide rain gauges & Train select staff/volunteers to be rain gauge readers	\$25,000	Would have to depend on staff / volunteers to correctly install gauge, correctly read and report heavy rain amounts as they occur.
	Facilitate the purchase and install of a rain gauge network, but no stream gauges.	\$75,000	Would provide rainfall amounts, but would not monitor snow melt runoff in the streams. Ability to monitor stream levels significantly improves situation awareness.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

TOWN OF ASHLAND

Tyler Run (Creek) Relocation/Realignment		Town of Ashland – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	During larger storm events, Tyler Run inundates both Church and Front Streets within the Village of Wellsburg (located within the Town of Ashland), resulting in the flooding of businesses and residences in both the Village and the Town.		
Action or Project Intended for Implementation			
Description of the Solution	Work with Chemung County Soil and Water to realign Tyler Run in a direct route to Bentley Creek and away from residences and businesses.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	100-year storm	Estimated Benefits (losses avoided)	This project would significantly reduce the flooding experienced in the Town, especially for the homes and businesses on Front and Church Streets.
Useful Life	50 yrs.		
Estimated Cost	\$400,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding
Responsible Organization	Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	Soil and Water District work schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Flood damages will continue
	Improvements to increase capacity of existing channel and culverts	\$650,000	Work would involve replacement of existing culverts and work on private property.
	Installation of flood control reservoir in the Tyler Run watershed	\$1,000,000	Work would involve construction of reservoir on private property. Reservoir would be a high hazard dam.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Town of Ashland – 2	
Risk/Vulnerability			
Hazard of Concern	Winter Storm, Thunderstorm, Flood, Tornado, Landslide		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No <input checked="" type="checkbox"/> X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$5,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Floodplain Management		Town of Ashland – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Town of Ashland – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Promote the use of floodproofing techniques for retrofitting existing flood-prone development by distributing educational materials. Materials have been made available on the County website and brochures are provided for annual mailings to residence.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$10,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$10,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Automated Rain Gauges and Stream Gauges		Town of Ashland – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Heavy rain often occurs in the hills above the residential area of Ashland, while the valley is getting little to no rain. The runoff causes unexpected flash flooding in the Ashland neighborhoods due to debris blocking drainage structures.		
Action or Project Intended for Implementation			
Description of the Solution	Install a precipitation and automated stream gauge upstream of Wellsburg (located within the limits of the Town of Ashland) to alert the Village when heavy rain or sharp stream rises are occurring to the south. The Village could have some advanced warning of possible flash flooding and could better respond to these events. Can also connect these rain gauges to a regional gauge system that tracks precipitation and river levels in neighboring towns, allowing for improved situational awareness in any rain event.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10-year storm	Estimated Benefits (losses avoided)	Would allow for Town response to problem areas before significant flooding started to occur, reducing or preventing flood damage to private property and homes. Would share data with other agencies for situational awareness.
Useful Life	25 years		
Estimated Cost	\$7,500		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	6 months	Potential Funding Sources	Grant funding, possible funding or in-kind assistance from Environmental Emergency Services (EES).
Responsible Organization	Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	Town and EES work plans
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur
	Provide rain gauges & Train select residents to be rain gauge readers	\$1,500	Would have to depend on residents to correctly install gauge, correctly read and report heavy rain amounts as they occur.
	Install only one gauge at a site that may serve all of residential area.	\$3,750	Would not have as accurate data as two sites for entire residential area. Not a significant cost savings.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Emergency Generator for Town of Ashland Fire Station		Town of Ashland – 6	
Risk/Vulnerability			
Hazard of Concern	Flood, Thunderstorm, Winter Storm, Tornado		
Description of the Problem	During flooding, severe storms and tornados, the Fire Station serves as the Emergency Operations Center (EOC) as well. Power outages are likely and render the facility useless. Within the Town Hall, there are lights, computers, heat, communications, etc., which all rely on electricity.		
Action or Project Intended for Implementation			
Description of the Solution	Installation of an emergency generator with hardwired quick connections for the Fire Station.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	The Fire Station and Emergency Operations Center will remain operational during power outages.
Useful Life	50 yrs.		
Estimated Cost	\$250,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	Town improvements schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make building generator ready	\$100,000.00	Would still be without power until a generator from State is requested through Emergency Management.
	Try to find another facility with power to use as EOC	Dependent on facility being used	Would have to move all operations to another location. Impractical to move EOC to another location.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Town of Ashland – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Ashland Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

TOWN OF BALDWIN

Elston Hollow Road Bridge Replacement		Town of Baldwin – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Elston Hollow bridge is undersized and in need of replacement. In addition, the hydraulic capacity of this structure may not comply with commonly accepted standards. Floodwaters can cause debris to back up at the bridge, exacerbating flooding, damaging the bridge and causing scour and erosion to embankments at the bridge site.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Elston Hollow Road bridge shall be replaced with a new box culvert. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) and guide railing shall be installed. The existing roadway within the limits of construction shall be repaved.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new box culvert with headwalls and guiderail will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Baldwin Administration	Local Planning Mechanisms to be Used in Implementation, if any	Town Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing bridge with bridge structure (concrete abutments & steel superstructure)	>\$250,000	More expensive than box culvert option
	Eliminate Elston Hollow Road Bridge crossing	<\$30,000	Not practicable. Crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Harrington Road (near Elston Hollow Road) Culvert Replacement		Town of Baldwin – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Harrington Road culvert is undersized and in need of replacement. The hydraulic capacity of this structure may not comply with commonly accepted standards.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Harrington Road culvert shall be replaced with a new culvert. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) may be installed.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new culvert with headwalls and guiderail will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$30,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Baldwin	Local Planning Mechanisms to be Used in Implementation, if any	Town Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing bridge with bridge structure (concrete abutments & steel superstructure)	>\$60,000	More expensive than culvert replacement option
	Eliminate Elston Hollow Road Bridge crossing	>\$7,000	Not practicable. Crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Nixon Culvert Replacement		Town of Baldwin – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Nixon Road culvert is undersized and in need of replacement. The hydraulic capacity of this structure may not comply with commonly accepted standards. Floodwaters can cause debris to back up at the bridge, exacerbating flooding, damaging the bridge and causing scour and erosion to embankments at the culvert site.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Nixon Road culvert shall be replaced with a new culvert. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) may be installed.		
Is this Project related to a Critical Facility?		Yes	No <input checked="" type="checkbox"/> X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new culvert will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$30,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Baldwin	Local Planning Mechanisms to be Used in Implementation, if any	Town Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culvert with bridge structure (concrete abutments & steel superstructure)	>\$60,000	More expensive than culvert replacement option
	Eliminate Nixon Road crossing	>\$7,000	Not practicable. Crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Town of Baldwin – 4	
Risk/Vulnerability			
Hazard of Concern	Winter Storm, Thunderstorm, Flood, Tornado, Landslide		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Baldwin Administration	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$5,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Stream Stabilization Program		Town of Baldwin – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Extreme rainfall events result in high stormwater flow rates, which result in the destabilization of stream channels (including streambanks), that causes erosion and deposition within these streams, as well as stream migration. The erosion of streambanks and migration of stream channels can jeopardize adjacent buildings, bridges, culverts, roadways, utilities, and other infrastructure.		
Action or Project Intended for Implementation			
Description of the Solution	The Chemung County Soil & Water District has a current program to stabilize streams and streambanks. This program will be expanded and implemented, to correct destabilized and migrated streams that pose risks to existing infrastructure. Continue work on Jackson Farm.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year Storm Event (min.)	Estimated Benefits (losses avoided)	Expansion and implementation of this program would result in prompt repairs to destabilized streams; improved protection for adjacent infrastructure; improved safety for motorists; and reduced sediment reaching waterbodies.
Useful Life	50 years		
Estimated Cost	Dependent upon stream and extent of damage		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Town of Baldwin	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Install retention/detention ponds to reduce impact to streams during heavy rain events.	Dependent on size, location and number of ponds required to lessen stream impacts	Less cost beneficial; Potential environmental impacts
	Proposed action	Dependent upon stream and extent of damage	Considered the best alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Dirt Road Upgrades		Town of Baldwin – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excessive rain causes dirt roads to turn into mud soup and can cause ditches to overflow. Road improvements are needed.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year	Estimated Benefits (losses avoided)	Improved hydraulic capacity; Reduction in sediment build-up issues; Improved reliability for roadway; Improved safety for motorists; Improved aquatic habitat of stream
Useful Life	50 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources
Responsible Organization	Town of Baldwin	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	\$150,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Town of Baldwin – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Baldwin Flood Insurance Rate Maps were developed from a limited flood study and currently have no base flood elevations. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Baldwin	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

TOWN OF BIG FLATS

Comprehensive Hydrology and Hydraulics (H&H) Studies of Various Watersheds			Town of Big Flats – 1
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	There has been significant construction activity in many portions of Big Flats since the last comprehensive H & H studies were conducted. Additionally, changing weather patterns which are producing more rainfall in shorter, more intensive periods have also likely invalidated studies that are now 10+ years old.		
Action or Project Intended for Implementation			
Description of the Solution	A set of mutually exclusive, but collectively exhaustive, H & H watershed studies that can be seamlessly integrated into a town-wide document. This set of studies will inform development and mitigation efforts, and will be submitted to FEMA for map revisions		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	Updated H & H studies will provide valuable engineering and planning guidance to our Town Leadership. The Planning Board, Code Department and Highway Department will be better equipped to make informed decisions.
Useful Life	10-20 years		
Estimated Cost	\$100-150K		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Fall 2018 – Fall 2019
Estimated Time Required for Project Implementation	9-12 months	Potential Funding Sources	FEMA grant, DEC grant, Town budget
Responsible Organization	Big Flats Public Works Department	Local Planning Mechanisms to be Used in Implementation, if any	None, n/a
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Forces reliance on outdated studies which do not consider latest weather patterns
	Continue to conduct only limited scope drainage studies when new development is proposed	\$20-30K annually	While acceptable in immediate proximity of new construction, will likely miss larger watershed impacts. Cannot be integrated
	Rely on Army COE and/or DEC studies whenever they might be conducted and published	\$25-50K annual costs for recovery work which might be avoided with newer H & H data	Federal/State studies are often subjected to schedule slips/cancellation due to budget concerns. Also, detail is typically less.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Debris Basin for Quail Hollow Development Drainage System		Town of Big Flats - 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Loose branches, brush and vegetation mix with drainage water and cause damming and plugged culverts. When this occurs, flood water escapes the existing drainage network, causing significant damage to public and private property. Recovery efforts are time consuming and labor intensive.		
Action or Project Intended for Implementation			
Description of the Solution	Constructing a debris basin and adding to the current stormwater management system will reduce flooding risk in Quail Hollow area since debris will now be captured before it enters and blocks critical elements of the drainage network. Location of the proposed basin will allow easy access for DPW crews to complete periodic cleaning.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	Will prevent significant erosion problems to ditches, road surfaces/shoulders and swales. Recovery work from flooding will be significantly reduced or eliminated.
Useful Life	30 years		
Estimated Cost	\$50K		
Plan for Implementation			
Prioritization	Med - High	Desired Timeframe for Implementation	Spring – Summer 2019
Estimated Time Required for Project Implementation	3 – 6 months	Potential Funding Sources	FEMA grant, DEC grant, Town budget
Responsible Organization	BF DPW	Local Planning Mechanisms to be Used in Implementation, if any	BF Building Codes
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Current drainage system susceptible to debris, failure during heavy storm events
	More frequent inspections and increased periodic maintenance	Recurring monthly labor and equipment costs estimated at \$2K/month	Labor intensive and costly approach which may not fully be effective since one heavy storm can create large amounts of debris
	Upstream stabilization project	\$700-800K+	Effective but expensive option due to limited access in area with mostly private property. Lengthy engineering and permit process could delay implementation.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Schweizer Levy System Upgrade / Dike Reinforcement / Outlet Channel Repair		Town of Big Flats - 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Dike surrounds the former Schweizer aircraft plant and is designed to prevent flooding of the plant during a 100-year/24-hour storm event. A diesel engine driven pump handles internal drainage water through the dike and outlet channel to the nearby Sing Sing creek. System operational status must be maintained. During storm events Sing Sing creek rises and threatens the former Schweizer aircraft plant. The current flood control project with installed dike and pump are effective mitigation measures however animal burrows have weakened the dike. Corroded structures need paint. Additionally, the outlet structure needs rip-rap relining.		
Action or Project Intended for Implementation			
Description of the Solution	Contract with appropriate firm to eliminate burrowing animal(s), then fill holes to prevent return. Add additional rip rap material to outlet structure for stabilization where needed. Remove trees/brush/weeds along dike. Complete preventative maintenance painting of corroded structures and repair gate valve to full functionality.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	Prompt action to eliminate the animal burrows and reline the outlet structure will prevent more costly repairs in the future. Repair of gate valve will insure full functionality if/when needed during a major storm event.
Useful Life	100 years (installed in 1986)		
Estimated Cost	\$15-30K		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Fall 2018
Estimated Time Required for Project Implementation	2-4 weeks	Potential Funding Sources	FEMA grant, DEC grant, Town budget
Responsible Organization	Town of Big Flats DPW. (need to obtain approval from USDA Soil Conservation Service before starting any work)	Local Planning Mechanisms to be Used in Implementation, if any	Building code, Nuisance animal ordinances (if applicable)
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	System will likely fail within next decade
	Perform only minimum maintenance like mowing, painting, oil changes.	\$2-3K annually	Skipping major maintenance saves money near term but will shorten life of system
	Pave dikes to prevent vegetation growth, line outlet channel with concrete to stop erosion	\$100K	Costly but efficient solution which reduces annual mowing and outlet channel repair costs.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Town Hall Basement Flood Water Mitigation		Town of Big Flats – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Flooding in finished basement during heavy rains and snow melts. Current sump system pumps water to outside retention pond and works satisfactorily except during heavy rains when retention pond fills to capacity. At those times, back pressure in building drain line prevents water flow from basement, causing drains to back up and basement to flood. Aug 2018 flooding led to 3-6-inch levels.		
Action or Project Intended for Implementation			
Description of the Solution	Plan is to connect outside retention pond to nearby Canal street storm sewer so pond level can be maintained below critical height during use.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	Complete protection is anticipated	Estimated Benefits (losses avoided)	Town Hall basement flooring, sheetrock, furniture and contents will be better protected. Aug 2018 flooding caused an estimated \$25K damage and forced relocation of personnel and stored records.
Useful Life	Permanent (50+ yrs.)		
Estimated Cost	\$25-30K		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Fall 2018 or Spring 2019
Estimated Time Required for Project Implementation	2-4 months	Potential Funding Sources	FEMA grant, Town budget
Responsible Organization	BF DPW	Local Planning Mechanisms to be Used in Implementation, if any	Town Building Codes
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insufficient protection w/current system
	Rent/install temporary pumps during storms. Create overtime schedule for DPW work crews to man	\$15-20K annually, assuming 2-3 events, each requiring 5-7 days manpower/pump rental	Only pumps water to parking lot; noisy and hoses/wires to trip over; requires manpower since building insecure
	Abandon basement space and construct new building or secure leased space in local area	\$150-200K new construction or \$3K monthly lease for office space	Loss of 2,500 sq. ft of usable basement offices require viable alternative to current temporary space "sharing" arrangement
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Town of Big Flats – 5	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Big Flats	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$5,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Stream Stabilization Program		Town of Big Flats – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Extreme rainfall events result in high stormwater flow rates, which result in the destabilization of stream channels (including streambanks), that causes erosion and deposition within these streams, as well as stream migration. The erosion of streambanks and migration of stream channels can jeopardize adjacent buildings, bridges, culverts, roadways, utilities, and other infrastructure.		
Action or Project Intended for Implementation			
Description of the Solution	The Chemung County Soil & Water District has a current program to stabilize streams and streambanks. This program will be expanded and implemented, to correct destabilized and migrated streams that pose risks to existing infrastructure. Continue work on Jackson Farm.		
Is this Project related to a Critical Facility?		Yes	No <input checked="" type="checkbox"/>
Level of Protection	25-year Storm Event (min.)	Estimated Benefits (losses avoided)	Expansion and implementation of this program would result in prompt repairs to destabilized streams; improved protection for adjacent infrastructure; improved safety for motorists; and reduced sediment reaching waterbodies.
Useful Life	50 years		
Estimated Cost	Dependent upon stream and extent of damage		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Town of Big Flats	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Install retention/detention ponds to reduce impact to streams during heavy rain events.	Dependent on size, location and number of ponds required to lessen stream impacts	Less cost beneficial; Potential environmental impacts
	Proposed action	Dependent upon stream and extent of damage	Considered the best alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Buyout Damaged Properties		Town of Big Flats - 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Homes have sustained repetitive flood losses. The Town of Big Flats has offered to assist the occupants with the buyout process. Will need to secure grant funding to proceed.		
Action or Project Intended for Implementation			
Description of the Solution	Buyout homes in the highest risk floodplain areas in order to relocate residents to safer locations, permanently eliminate the risk of repetitive damage to homes, and restore natural floodplain functions. The Town of Big Flats will identify willing sellers, pursue grant funding, and assist with the buyout process.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	100-year storm event	Estimated Benefits (losses avoided)	Reduce the damage to residential property and the disruption to life caused by repeated flooding.
Useful Life	100 years		
Estimated Cost	>\$1,000,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Big Flats	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Continuing repetitive losses; Residents remain in harm's way; Emergency services required in high risk areas
	Relocate homes	>\$2,000,000	Less cost effective; Less feasible option due to age of structures
	Proposed Action	>\$1,000,000 (Depending on the number of willing participants)	Cost effective alternative; No residual risk
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Floodplain Management		Town of Big Flats – 8	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Improve CRS Ratings		Town of Big Flats – 9	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Municipalities will work with STC, EMO and other agencies to improve CRS credits and increase CRS ratings to provide residents with better rates for NFIP.		
Action or Project Intended for Implementation			
Description of the Solution	The Town of Big Flats maintained CRS Class 8. Current code enforcement staff have taken floodplain management training which helps with ratings. Project is ongoing to identify additional activities that will help the community improve ratings.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Attaining this goal would ensure better NFIP rates for residents.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$10,000	Cost effective but provides no financial relief to residents
	Proposed project	Staff time	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Town of Big Flats – 10	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Big Flats Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Big Flats	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

TOWN OF CATLIN

Catlin Highway Shop Generator		Town of Catlin – 1	
Risk/Vulnerability			
Hazard of Concern	Thunderstorm, Winter Storm, Tornado		
Description of the Problem	During severe weather conditions the Town Highway shop, due to its location and position on the NYSEG Grid, often loses power for lengthy periods of time. This essentially shuts down operations in the building. Heat, lighting, communications, vehicle maintenance, vehicle entry doors are all electricity dependent		
Action or Project Intended for Implementation			
Description of the Solution	Install an emergency generator to keep the Highway shop in operation.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	HIGH	Estimated Benefits (losses avoided)	Allows Town of Catlin Highway shop to remain operational during severe weather events, when Highway services are in greatest need and demand.
Useful Life	25-30 yrs.		
Estimated Cost	\$200,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding; possible bond, loan or tax increase to cover local share.
Responsible Organization	Town of Catlin	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make Shop generator ready	\$100,000	Would still require Town to request a generator through County Emergency Management and wait for delivery
	Secure agreement with another town or County to work out of their shop.	\$2500 per occurrence	Would take extra time and mileage to work from remote location, and additional costs associated with contracting equipment maintenance.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Dunn Road Stormwater Detention & Debris Basin Project		Town of Catlin – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	During intense rainfall events, run-off from the Dunn Rd area runs downhill eroding ground and washing out trees and other debris. A stormwater detention/debris basin would attenuate peak flow rates, allow erosion sediment settle out, and allow trees and other debris to be deposited in a controlled area instead of being washed down into culverts and creeks/streams.		
Action or Project Intended for Implementation			
Description of the Solution	Design and construction of a stormwater detention & debris basin		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	Up to 10-year storm event	Estimated Benefits (losses avoided)	Would reduce peak stormwater flows, mitigate erosion of soil and trees, to alleviate clogging creeks, streams and culverts, pipes during severe weather events and high flow conditions.
Useful Life	75 yrs.		
Estimated Cost	\$200,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding- NYSDEC Water Quality Improvement Projects and / or Hazard Mitigation Grants
Responsible Organization	Town of Catlin	Local Planning Mechanisms to be Used in Implementation, if any	As opportunity presents with land owners
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Reduce flood damages; Increase drainage capacity
	Complete stream stabilization- top to bottom stabilization project.	\$600,000	Would still have debris and some erosion effects requiring continued emergency response/maintenance.
	Concrete Conveyance system	\$1 million	Would be cost prohibitive, would destroy natural habitat and unlikely to be approved by DEC.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Town of Catlin – 3	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Catlin	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$5,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Dirt Road Upgrades		Town of Catlin - 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excessive rain causes dirt roads to turn into mud soup and can cause ditches to overflow. Road improvements are needed.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year	Estimated Benefits (losses avoided)	Improved hydraulic capacity; Reduction in sediment build-up issues; Improved reliability for roadway; Improved safety for motorists; Improved aquatic habitat of stream
Useful Life	50 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources
Responsible Organization	Town of Catlin	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	\$150,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Town of Catlin – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Catlin Flood Insurance Rate Maps were developed from a limited flood study and currently have no base flood elevations. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Catlin	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

TOWN OF CHEMUNG

Roberts Hollow Road Bridge Replacement		Town of Chemung – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Roberts Hollow Road bridge is undersized and in need of replacement. The hydraulic capacity of this structure may not comply with commonly accepted standards.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Roberts Hollow Road bridge shall be replaced with an upgraded box culvert. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) and guide railing shall be installed. The existing roadway within the limits of construction shall be repaved.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new box culvert with headwalls and guiderail will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$520,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	Town Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing bridge with bridge structure (concrete abutments & steel superstructure)	>\$630,000	More expensive than box culvert option
	Eliminate Roberts Hollow Road Bridge	<\$30,000	Not practicable. Crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Rowley Road Culvert Replacements & Stream Stabilization		Town of Chemung – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Two existing culverts below Rowley Road are undersized and in need of replacement. The hydraulic capacity of this structure may not comply with commonly accepted standards.		
Action or Project Intended for Implementation			
Description of the Solution	Two existing culverts shall be replaced with upgraded culverts. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) and guide railing shall be installed. In addition, complimentary stream stabilization work shall be completed for the stream that flows through these culverts.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm event (approx.)	Estimated Benefits (losses avoided)	Two new culverts with headwalls and guiderail will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$175,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	Town Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culverts with bridge structures (concrete abutments & steel superstructure)	>\$300,000	More expensive than option involving replacements with culverts
	Eliminate the two culverts on Rowley Road	<\$30,000	Not practicable. Crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Mallory Road Culvert Replacement		Town of Chemung – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	An existing culvert below Mallory Road (near Miller Hollow Road) is undersized and in need of replacement. The hydraulic capacity of this structure may be insufficient to accommodate peak storm flows of commonly accepted design return periods.		
Action or Project Intended for Implementation			
Description of the Solution	The existing culvert shall be replaced with an upgraded culvert. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) shall be installed.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm event (approx.)	Estimated Benefits (losses avoided)	New culvert with headwalls will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$40,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	Town Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culvert with bridge structures (concrete abutments & steel superstructure)	>\$250,000	More expensive than option involving replacements with culvert
	Eliminate this culvert crossing on Mallory Road	<\$20,000	Not practicable. Crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Town of Chemung – 4	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$5,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Buyout Damaged Properties		Town of Chemung – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Homes have sustained repetitive flood losses. The Town of Chemung has offered to assist the occupants with the buyout process. Will need to secure grant funding to proceed.		
Action or Project Intended for Implementation			
Description of the Solution	Buyout homes in the highest risk floodplain areas in order to relocate residents to safer locations, permanently eliminate the risk of repetitive damage to homes, and restore natural floodplain functions. The Town of Chemung will identify willing sellers, pursue grant funding, and assist with the buyout process.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	Reduce the damage to residential property and the disruption to life caused by repeated flooding.
Useful Life	60 years		
Estimated Cost	>\$1,000,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Continuing repetitive losses; Residents remain in harm's way; Emergency services required in high risk areas
	Relocate homes	>\$2,000,000	Less cost effective; Less feasible option due to age of structures
	Proposed Action	>\$1,000,000 (Depending on the number of willing participants)	Cost effective alternative; No residual risk
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Dirt Road Upgrades		Town of Chemung – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excessive rain causes dirt roads to turn into mud soup and can cause ditches to overflow. Road improvements are needed.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year	Estimated Benefits (losses avoided)	Improved hydraulic capacity; Reduction in sediment build-up issues; Improved reliability for roadway; Improved safety for motorists; Improved aquatic habitat of stream
Useful Life	50 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	\$150,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Town of Chemung – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Chemung Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

CITY OF ELMIRA

Upgrade existing Eldridge Park Stormwater Pump Station		City of Elmira – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The City owns and maintains a stormwater pump station at Eldridge Park. This stormwater pump station pumps stormwater from Eldridge Lake to a tributary to Newtown Creek. Upgrade of the pumps and electrical system is needed for this station, as well as the installation of an emergency generator.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade of the pumps and electrical systems and installation of an electric generator for the Eldridge Lake stormwater pump station.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm	Estimated Benefits (losses avoided)	Would control the storm run-off from a significant portion of the City, such to prevent ponding within developed portions of the City.
Useful Life	50 Years		
Estimated Cost	\$425,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	All Federal, State, Local Funding HMGP, PDM FMA And chips
Responsible Organization	City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Local improvements plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Flood damages will continue
	Complete replacement of existing stormwater pump station	>\$800,000	The complete replacement of the pump station would have a significant project cost.
	Elimination of Eldridge Lake stormwater pump station	\$100,000	This would result in increased flooding levels and risks for a sizeable portion of the City.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Fassett Road Storm Sewer Project		City of Elmira – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The portion of Fassett Road between Hoffman Street and ABC Drive is prone to flooding from runoff from a developed upland watershed. Approximately once per year, this portion of Fassett Road becomes completely inundated with water depths of over 1 foot. This inundation presents hazards to both motorists and pedestrians, as well as to adjacent residents.		
Action or Project Intended for Implementation			
Description of the Solution	The installation of a storm sewer system that would collect runoff uphill of ABC Drive and convey this runoff (as well as runoff from Fassett Road) to a discharge point on Hoffman Brook. The goal of this work is to more reliably drain Fassett Road such to reduce the frequency of flooding/inundation.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm	Estimated Benefits (losses avoided)	This Action Item would provide improved stormwater collection and conveyance for a portion of Fassett Road that is prone to flooding/inundation, to reduce the frequency of flooding/inundation.
Useful Life	50 Years		
Estimated Cost	\$1,700,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	3 years	Potential Funding Sources	All Federal, State, Local Funding HMGP, PDM FMA And chips
Responsible Organization	City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Local improvements plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Flood damages will continue
	Installation of stormwater detention basin in upland watershed to reduce peak flows to Fassett Road.	>\$750,000	An open location of adequate size to site a stormwater detention basin does not exist at this time.
	Installation of stormwater pump station for this portion of Fassett Road	>\$700,000	High O & M costs. Need to obtain easement to site/construct on adjacent private property.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		City of Elmira – 3	
Risk/Vulnerability			
Hazard of Concern	Winter Storm, Thunderstorm, Flood, Tornado, Landslide		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$5,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Floodplain Management		City of Elmira – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Drainage System Improvements		City of Elmira – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Inadequate drainage systems along Coleman Avenue, Fassett Road and Hoffman Street cause flooding, damages to roadways, and create hazardous driving conditions for motorists.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade the stormwater system on Coleman Avenue, Fassett Road and Hoffman Street to prevent flooding.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10 yr. storm	Estimated Benefits (losses avoided)	Improved reliability for roadway; Improved safety for motorists.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grants
Responsible Organization	City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	Staff time	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Maintenance on the Old Chemung Canal Project		City of Elmira – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Chemung Canal joined the Chemung River, extending northward linking the river to the Erie Canal via Seneca Lake. The canal paralleled the Chemung River for long sections, sharing part of its water and drainage basin, by building dams and locks. The Canal has is no longer in use, but the remains are still in place. This area becomes paralyzed by the regional rains and flooding requiring maintenance.		
Action or Project Intended for Implementation			
Description of the Solution	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm	Estimated Benefits (losses avoided)	Continued maintenance of this program would result in
Useful Life	50 years		
Estimated Cost	\$2,000 per municipality		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Local funding sources
Responsible Organization	City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Increases in debris and sediment will increase flood depths and damages
	Complete removal of the canal remnants and alternative drainage mitigation	\$50,000,000	Not cost effective; Significant Environmental concerns
	Proposed Project	\$2,000 per municipality	Cost effective; reduces future flood damages
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		City of Elmira – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The City of Elmira Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

TOWN OF ELMIRA

Town of Elmira Upper Larchmont Dam Improvement		Town of Elmira – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The hazard classification of the Upper Larchmont Dam was increased to High-Hazard by the NYSDEC, requiring the size of the emergency spillway is to be increased (including re-designed and possibly relocated).		
Action or Project Intended for Implementation			
Description of the Solution	Increase size of emergency spillway.		
Is this Project related to a Critical Facility?		Yes	No
Level of Protection	500 yr. flood event	Estimated Benefits (losses avoided)	The hazard class of the Dam has been reclassified by NYSDEC. The project will bring Town into compliance with the new high-hazard classification.
Useful Life	100 years		
Estimated Cost	\$250,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	6 months	Potential Funding Sources	Hazard Mitigation Grant; general fund and in-kind for local share
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Redesign dam in new location	>\$750,000	Cost prohibitive and acquiring new location property would require agreement of property owners.
	Redesign current dam into two smaller dams with separate spillways	>\$750,000	Determining location of second spillway without impacting existing homes virtually impossible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Town of Elmira Fern Dell Culvert Improvement		Town of Elmira – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Drainage system needs to be enlarged and/or modified to accommodate the peak stormwater flows of nearby Beecher Creek, mitigating the downstream flooding caused by this stream.		
Action or Project Intended for Implementation			
Description of the Solution	Enlargement and modification to Elmira's Fern Dell culvert.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	Up to 50 yr. flood event	Estimated Benefits (losses avoided)	Mitigation of residential flooding, damage to homes and private property.
Useful Life	100 years		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 years
Estimated Time Required for Project Implementation	2 months	Potential Funding Sources	Local funds
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Annual work plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Direct overflows from Fern Dell Culvert to an adjacent culvert, to increase overall capacity	\$10,000	An existing culvert adjacent to the Fern Dell culvert may be under-utilized and may have available capacity to accept overflows from Fern Dell culvert.
	Replace existing Fern Dell Culvert with a larger culvert	\$30,000	Construction for this alternative would be more costly and time consuming than currently considered project.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Automated Rain Gauges		Town of Elmira – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Heavy rain often occurs in the hills above the residential area of West Elmira, while the valley is getting little to no rain. The runoff causes unexpected flash flooding in the West Elmira neighborhoods due to debris blocking drainage structures.		
Action or Project Intended for Implementation			
Description of the Solution	Installing automated rain gauges near the headwaters of the two creeks that experience the most flooding would give Highway staff a warning that heavy rain is falling and would allow for response to problem areas before debris clogged the drainage structures. Can also connect these rain gauges to a regional gauge system that tracks precipitation and river levels in neighboring towns, allowing for improved situational awareness in any rain event.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10-year storm	Estimated Benefits (losses avoided)	Would allow for Town response to problem areas before significant flooding started to occur, reducing or preventing flood damage to private property and homes. Would share data with other agencies for situational awareness.
Useful Life	25 years		
Estimated Cost	\$7500		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	6 months	Potential Funding Sources	Grant funding, possible funding or in-kind assistance from Environmental Emergency Services (EES).
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Town and EES work plans
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Provide rain gauges & Train select residents to be rain gauge readers	\$1500.00	Would have to depend on residents to correctly install gauge, correctly read and report heavy rain amounts as they occur.
	Install only one gauge at a site that may serve all of residential area.	\$3750.00	Would not have as accurate data as two sites for entire residential area. Not a significant cost savings.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Town of Elmira – 4	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Buyout Damaged Properties		Town of Elmira – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Homes have sustained repetitive flood losses. The Town of Elmira has offered to assist the occupants with the buyout process. Will need to secure grant funding to proceed.		
Action or Project Intended for Implementation			
Description of the Solution	Buyout homes in the highest risk floodplain areas in order to relocate residents to safer locations, permanently eliminate the risk of repetitive damage to homes, and restore natural floodplain functions. The Town of Elmira will identify willing sellers, pursue grant funding, and assist with the buyout process.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	Reduce the damage to residential property and the disruption to life caused by repeated flooding.
Useful Life	60 years		
Estimated Cost	>\$1,000,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Continuing repetitive losses; Residents remain in harm's way; Emergency services required in high risk areas
	Relocate homes	>\$2,000,000	Less cost effective; Less feasible option due to age of structures
	Proposed Action	>\$1,000,000 (Depending on the number of willing participants)	Cost effective alternative; No residual risk
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Floodplain Management		Town of Elmira – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Drainage System Improvements		Town of Elmira – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Inadequate drainage systems along Coleman Avenue, Fassett Road and Hoffman Street cause flooding, damages to roadways, and create hazardous driving conditions for motorists.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade the stormwater system on Coleman Avenue, Fassett Road and Hoffman Street to prevent flooding		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10 yr. storm	Estimated Benefits (losses avoided)	Improved reliability for roadway; Improved safety for motorists.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grants
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	Staff time	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Maintenance on the Old Chemung Canal Project		Town of Elmira - 8	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Chemung Canal joined the Chemung River, extending northward linking the river to the Erie Canal via Seneca Lake. The canal paralleled the Chemung River for long sections, sharing part of its water and drainage basin, by building dams and locks. The Canal has is no longer in use, but the remains are still in place. This area becomes paralyzed by the regional rains and flooding requiring maintenance.		
Action or Project Intended for Implementation			
Description of the Solution	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm	Estimated Benefits (losses avoided)	Continued maintenance of this program would result in
Useful Life	50 years		
Estimated Cost	\$2,000 per municipality		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Local funding sources
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Increases in debris and sediment will increase flood depths and damages
	Complete removal of the canal remnants and alternative drainage mitigation	\$50,000,000	Not cost effective; Significant Environmental concerns
	Proposed Project	\$2,000 per municipality	Cost effective; reduces future flood damages
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Town of Elmira – 9	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Elmira Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

VILLAGE OF ELMIRA HEIGHTS

Oakwood Ave Drainage Project		Village of Elmira Heights – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	When there is rain, ponding occurs in a topographic sag portion of Oakwood Avenue due to the lack of a stormwater collection system. It floods so bad that barricades need to be placed and prevent vehicles and emergency vehicles from going through the high water, making traffic divert to an alternate route. This is the main route for ambulances to get to the hospital.		
Action or Project Intended for Implementation			
Description of the Solution	A stormwater collection system would be installed that would convey stormwater from the sag in Oakwood Avenue to the existing stormwater detention basin on the Elementary School property. A flap gate valve and a knife gate valve may be needed, as part of the system.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10-year storm	Estimated Benefits (losses avoided)	To collect and convey stormwater within Oakwood Avenue to reduce hazards for motorists, prevent traffic delays, and allow emergency vehicles access to the community and hospital.
Useful Life	50 Years		
Estimated Cost	\$20,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	All Federal, State, Local Funding HMGP, PDM, FMA, and chips
Responsible Organization	Village of Elmira Heights	Local Planning Mechanisms to be Used in Implementation, if any	Plan by Soil & Water District engineer
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Larger drywells	>\$25,000	There are multiples utilities that will have to be moved. Also, soils do not appear to be highly permeable.
	Allow stormwater to drain directly into the sanitary sewer	\$2000	This would not be in compliance with Chemung County Sewer District requirements
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Upgrade / Retrofit of Existing Stormwater Pump Stations		Village of Elmira Heights – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Village owns and maintains three stormwater pump stations. The College Ave. pump station must be manually activated. For the 13 th Street pump station and the McCanns Blvd pump station, upgrade/retrofit of the pumps and electrical systems are needed, as well as emergency generators needed for each of these stations.		
Action or Project Intended for Implementation			
Description of the Solution	Installation of automatic controls for the College Ave. pump station. Rehabilitation/replacement of the pumps and electrical systems and installation of electric generators with hardwired quick connections for the 13 th Street and McCanns Blvd pump stations.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm	Estimated Benefits (losses avoided)	Would control the storm run off for several major roadways through the village. Would allow emergency vehicles access through areas that usually flood, including main route to Hospital.
Useful Life	50 Years		
Estimated Cost	\$700,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	All Federal, State, Local Funding HMGP, PDM FMA And chips
Responsible Organization	Village of Elmira Heights	Local Planning Mechanisms to be Used in Implementation, if any	Local improvements plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Installation of a high-water alarm that will sound to alert that pumps need to be turned on for College Ave. station.	\$10,000	Without automatic controls, flooding may occur before the pumps can be turned on.
	Allow stormwater to overflow/drain into the sanitary sewer system	\$10,000	This would not comply with Chemung County Sewer District requirements
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Rehabilitation to Existing Stormwater Detention Basin to West of 17 th Street Area		Village of Elmira Heights – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The 17 th Street stormwater detention basin is in need of rehabilitation including the removal of woody growth from the embankment, stabilization of emergency spillway, and the replacement of the principle spillway conduit system. This existing stormwater detention basin receives runoff from a 63-acre watershed on the hillside above the west end of 17 th Street. This detention basin reduces peak stormwater flow rates and protects the downstream intensely developed area of the Village.		
Action or Project Intended for Implementation			
Description of the Solution	Improvements would be completed to the existing detention basin to remove woody growth from the basin embankment; revegetate the basin embankment; stabilization/widening of the emergency spillway; and the replacement of the existing principle spillway conduit system.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-Year Storm	Estimated Benefits (losses avoided)	Completion of the rehabilitation of the basin would allow with continued protection of the downstream community with increased reliability and performance.
Useful Life	75 years		
Estimated Cost	\$250,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 Years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grant funding; Possible state and local funding
Responsible Organization	Village of Elmira Heights	Local Planning Mechanisms to be Used in Implementation, if any	Local improvements plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Decommissioning of 17 th Street Stormwater Detention Basin	\$200,000	Increased flooding risk for downstream development. Increased flow rates to NYS Route 14, which may be unacceptable.
	Replacing downstream storm sewers with larger sewers to increase hydraulic capacity of system	>\$1,250,000	Costly project. Also, improvements to the existing detention basin at the Elementary School may be needed. Possibility of increased flows to NYS Route 14.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Village of Elmira Heights – 4	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Village of Elmira Heights	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Floodplain Management		Village of Elmira Heights – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Village of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Maintenance on the Old Chemung Canal Project		Village of Elmira Heights – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Chemung Canal joined the Chemung River, extending northward linking the river to the Erie Canal via Seneca Lake. The canal paralleled the Chemung River for long sections, sharing part of its water and drainage basin, by building dams and locks. The Canal has is no longer in use, but the remains are still in place. This area becomes paralyzed by the regional rains and flooding requiring maintenance.		
Action or Project Intended for Implementation			
Description of the Solution	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm	Estimated Benefits (losses avoided)	Continued maintenance of this program would result in
Useful Life	50 years		
Estimated Cost	\$2,000 per municipality		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Local funding sources
Responsible Organization	Village of Elmira Heights	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Increases in debris and sediment will increase flood depths and damages
	Complete removal of the canal remnants and alternative drainage mitigation	\$50,000,000	Not cost effective; Significant Environmental concerns
	Proposed Project	\$2,000 per municipality	Cost effective; reduces future flood damages
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Village of Elmira Heights – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Village of Elmira Heights Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Village of Elmira Heights	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

TOWN OF ERIN

Chapman Road Stream Stabilization & Sediment Basin		Town of Erin – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excessive erosion within the upper portions of the stream along Chapman Road results in excessive sediment being deposited in the lower portions of this stream near Chapman Road, resulting in the diversion of flows from the stream to the travel lanes of Chapman Road.		
Action or Project Intended for Implementation			
Description of the Solution	The stream along Chapman Road shall be stabilized with dimensional rock rip rap to reduce streambank erosion. In addition, a sediment basin shall be installed on this stream, to allow sediment to accumulate in a location where equipment can readily access to remove this sediment.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year	Estimated Benefits (losses avoided)	Improved hydraulic capacity; Reduction in sediment build-up issues; Improved reliability for roadway; Improved safety for motorists; Improved aquatic habitat of stream
Useful Life	50 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources
Responsible Organization	Town of Erin	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Unacceptable flood overtopping frequency
	Abandonment of Chapman Road	\$20,000	Unacceptable inconvenience to homeowners & traveling public; unacceptable delays for emergency vehicles
	Replacement of stream with large box culvert	>\$2,000,000	Excessive project costs
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Rorick Hollow Road Culvert Replacement Project		Town of Erin – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Three sets of twin culverts along Rorick Hollow Road are prone to clogging and may also be undersized, resulting in the frequent overflowing of these culverts with these overflows crossing the public thoroughfare.		
Action or Project Intended for Implementation			
Description of the Solution	The three sets of existing twin culverts shall be replaced with larger culverts. Furthermore, the alignment of the entrances of the culverts shall be staggered and spaced to help alleviate the historic debris build-up.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year	Estimated Benefits (losses avoided)	Improved hydraulic capacity; Reduction in debris build-up issues; Improved reliability for roadway; Improved safety for motorists
Useful Life	50 years		
Estimated Cost	\$300,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources
Responsible Organization	Town of Erin	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Unacceptable flooding overtopping frequency
	Abandonment of Rorick Hollow Road	\$20,000	Unacceptable inconvenience to homeowners & traveling public; unacceptable delays for emergency vehicles
	Replacement with large box culverts	>\$600,000	High project costs
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Town of Erin – 3	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Erin	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$50,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Buyout Damaged Properties		Town of Erin – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Homes have sustained repetitive flood losses. The Town of Erin has offered to assist the occupants with the buyout process. Will need to secure grant funding to proceed.		
Action or Project Intended for Implementation			
Description of the Solution	Buyout homes in the highest risk floodplain areas in order to relocate residents to safer locations, permanently eliminate the risk of repetitive damage to homes, and restore natural floodplain functions. The Town of Erin will identify willing sellers, pursue grant funding, and assist with the buyout process.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	Reduce the damage to residential property and the disruption to life caused by repeated flooding.
Useful Life	60 years		
Estimated Cost	>\$1,000,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Erin	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Continuing repetitive losses; Residents remain in harm's way; Emergency services required in high risk areas
	Relocate homes	>\$2,000,000	Less cost effective; Less feasible option due to age of structures
	Proposed Action	>\$1,000,000 (Depending on the number of willing participants)	Cost effective alternative; No residual risk
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Dirt Road Upgrades		Town of Erin – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excessive rain causes dirt roads to turn into mud soup and can cause ditches to overflow. Road improvements are needed.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year	Estimated Benefits (losses avoided)	Improved hydraulic capacity; Reduction in sediment build-up issues; Improved reliability for roadway; Improved safety for motorists; Improved aquatic habitat of stream
Useful Life	50 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources
Responsible Organization	Town of Erin	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	\$150,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Town of Erin – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Erin Flood Insurance Rate Maps were developed from a limited flood study and currently have no base flood elevations. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Erin	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

TOWN OF HORSEHEADS

Woodgate Road Culvert Replacement (near Prospect Road)		Town of Horseheads – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Woodgate Road culvert is a 6-foot diameter steel pipe that is aged and in need of replacement. This culvert allows access to Woodgate Road (a dead-end road) from Prospect Creek.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Woodgate Road culvert shall be replaced with a new concrete box culvert (of appropriate hydraulic capacity) to accommodate an appropriate design storm event return period. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) shall be reinstalled and guiderail shall be installed.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new box culvert will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$130,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culvert with bridge structure (concrete abutments & steel superstructure)	>\$200,000	More expensive than box culvert replacement
	Eliminate Woodgate Road stream crossing	>\$20,000	Not practicable. Woodgate Road is a dead-end road and the crossing is needed to provide required roadway access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Ashland Avenue Culvert Replacement		Town of Horseheads – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Ashland Avenue culvert is a 6.5-foot (approx.) diameter steel pipe that is inadequate and is in need of replacement.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Ashland Avenue culvert shall be replaced with a new concrete box culvert (of appropriate hydraulic capacity) to accommodate an appropriate design storm event return period. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) shall be installed and guiderail shall be installed.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new box culvert will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$250,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culvert with bridge structure (concrete abutments & steel superstructure)	>\$375,000	More expensive than box culvert replacement
	Eliminate Ashland Avenue stream crossing	>\$50,000	Not practicable. Ashland Avenue is a well-traveled roadway and the crossing is needed to provide required roadway access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Town of Horseheads – 3	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Floodplain Management		Town of Horseheads – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Improve CRS Ratings		Town of Horseheads – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions. Municipalities will work with STC, EMO and other agencies to improve CRS credits and increase CRS ratings to provide residents with better rates for NFIP.		
Action or Project Intended for Implementation			
Description of the Solution	STC, EMO and other agencies will facilitate activities resulting in a comprehensive approach to floodplain management. These activities will increase CRS ratings.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC, EMO and other agencies.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Town of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$10,000	Cost effective but provides no financial relief to residents
	Proposed project	Staff time	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Maintenance on the Old Chemung Canal Project		Town of Horseheads – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Chemung Canal joined the Chemung River, extending northward linking the river to the Erie Canal via Seneca Lake. The canal paralleled the Chemung River for long sections, sharing part of its water and drainage basin, by building dams and locks. The Canal has is no longer in use, but the remains are still in place. This area becomes paralyzed by the regional rains and flooding requiring maintenance.		
Action or Project Intended for Implementation			
Description of the Solution	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm	Estimated Benefits (losses avoided)	Continued maintenance of this program would result in
Useful Life	50 years		
Estimated Cost	\$2,000 per municipality		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Local funding sources
Responsible Organization	Town of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Increases in debris and sediment will increase flood depths and damages
	Complete removal of the canal remnants and alternative drainage mitigation	\$50,000,000	Not cost effective; Significant Environmental concerns
	Proposed Project	\$2,000 per municipality	Cost effective; reduces future flood damages
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Town of Horseheads – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Horseheads Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

VILLAGE OF HORSEHEADS

Upgrade / Replacement of Swamp Storm Sewer		Village of Horseheads – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The current stormwater conveyance conduit is inadequate for current needs and is in need of upgrading and/or replacement. This storm sewer is approximately 2065 LF and passes below two large commercial buildings, as well as public streets. This storm sewer drains a swamp (where Prospect Creek discharges) and conveys flows to Newtown Creek.		
Action or Project Intended for Implementation			
Description of the Solution	The Village would like to hire a specialty contractor to reline the structure with an in-situ lining system to provide structural integrity to the entire length of the existing stormwater conveyance conduit.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year flood event	Estimated Benefits (losses avoided)	Will help mitigate flooding in the Village of Horseheads and Town of Horseheads and will prevent illegal transfer of flow from the Susquehanna River Basin to the Finger Lakes Basin.
Useful Life	50 years		
Estimated Cost	\$1.2 million		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 5 year
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Hazard Mitigation Grant; in-kind for local share
Responsible Organization	Village of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Village Improvement Plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Buy out all businesses and property above the drainage structure and raze to expose the conduit then replace.	\$3 million	Cost prohibitive and would decrease Village economy by reducing commercial base.
	Design and installation of a stormwater pump station and force main system to convey stormwater to Newtown Creek	\$2 million	Cost prohibitive and would require purchase of properties (or easements) for proposed infrastructure.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Emergency Generator for Village's Highway Building		Village of Horseheads – 2	
Risk/Vulnerability			
Hazard of Concern	Flood, Winter Storm, Thunderstorm, Tornado		
Description of the Problem	During power outages, the Highway building is without lights, communications and maintenance equipment/machinery. The operations are basically brought to a halt.		
Action or Project Intended for Implementation			
Description of the Solution	Installation of an emergency generator, with hard wired quick connections, that is capable of accommodating the entire building.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	Highway operations would be able to continue uninterrupted during power outages (often the times of greatest need).
Useful Life	30 years		
Estimated Cost	\$225,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding with in-kind match, possible partial funding through Village budget
Responsible Organization	Village of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Local work plan and budget workshops
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make building generator ready	\$100,000.00	Would still be without power during the period of time we request a generator from State through Emergency Management
	On a temporary basis, work from a different location	>\$2500.00 per incident	Would require another shop to make room and accommodate employee/equipment needs or rent maintenance space. Such a shop may not be available. Extra travel time taking away from response work.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Generator Project for Groundwater Supply Wells #1 & #2		Village of Horseheads – 3	
Risk/Vulnerability			
Hazard of Concern	Flood, Thunderstorm, Winter Storm, Tornado		
Description of the Problem	During periods of power outages, groundwater supply Wells #1 & #2 are not functional, due to the lack of emergency power. Well #1 and Well #2 are the primary water supply sources for the Village's municipal water system. Lack of emergency power could result in the inability to supply water to the users, as well as compromising fire protection capabilities.		
Action or Project Intended for Implementation			
Description of the Solution	Complete improvements to make Wells 1&2 generator ready and purchase a 200KW generator to be kept on a trailer, making it immediately available when needed for either the Well #1 or the Well #2.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	Will provide the Village the ability to maintain operation of Wells #1 and #2 during power outages, to ensure that water supply to the community (as well as fire protection capabilities) is reliably maintained.
Useful Life	30 years		
Estimated Cost	\$275,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding with in-kind local share, and possible local budget funding
Responsible Organization	Village of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Village work plan and budget workshops
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make wells generator ready without purchase of generator	\$70,000.00	Would still need to request to borrow a generator through Emergency Management, which many times may be unavailable for periods of time that are longer than the outage.
	Construction a water pump station (with generator) at connection to Elmira Water Board system.	>\$1.2 million	This pump station would convey water from the Elmira Water Board system to the Village system, providing a back-up water supply.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Village of Horseheads – 4	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Village of Horseheads Administration	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Village of Horseheads – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Village of Horseheads Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Village of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

VILLAGE OF MILLPORT

Generator for Millport Fire Station		Village of Millport – 1	
Risk/Vulnerability			
Hazard of Concern	Thunderstorm, Winter Storm, Tornado, Flood		
Description of the Problem	During power outages the Fire Station has no lights, heat, communications or equipment maintenance machinery. The Fire Station also serves as the Village Emergency Operations Center and the primary stop over point for residents affected by an emergency.		
Action or Project Intended for Implementation			
Description of the Solution	Install an Emergency Generator with hardwired quick connections		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	The Fire Department and Village EOC would be able to continue operations during a power outage and provide a safe place for residents during an emergency.
Useful Life	30 years		
Estimated Cost	\$200,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding
Responsible Organization	Village of Millport	Local Planning Mechanisms to be Used in Implementation, if any	Local Village work plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make building generator ready	\$100,000.00	Would still be without power until we request a generator from State through Emergency Management
	Use alternate facilities such as Village of Millport Town Hall and Town Highway for Fire Ops	\$2500 per occurrence	Would displace staff and make us rely on others for services, and possibly rent space for maintenance of Fire Equipment.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Development of Back-Up Groundwater Supply Well for Municipal Water System		Village of Millport – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Insufficient Redundancy regarding the Water Supply System for the Village's municipal water system. The Village only has one well to serve the residents. It is a shallow well at 40 feet deep and is in close proximity to an agricultural field. If this existing well is ever out-of-service (such as being contaminated by flood waters), the Village will be without water, compromising the fire protection system.		
Action or Project Intended for Implementation			
Description of the Solution	Secure a location for the back-up water supply well; complete associated test well, flow testing, and water quality testing; design back-up well; pursue and obtain regulatory permitting; and install back-up water supply well facility.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	The Village would have a back-up well to improve water supply redundancy to better ensure a constant supply of potable water for the residents, as well as a more reliable fire protection system.
Useful Life	100 years		
Estimated Cost	\$500,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	6 months	Potential Funding Sources	Grant funding, possible State and Local funding
Responsible Organization	Village of Millport	Local Planning Mechanisms to be Used in Implementation, if any	Local Village work plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Connection to & Extension of Horseheads Village System	> \$2,000,000	Cost prohibitive. Also, a regulatory issue may exist as water from the Susquehanna River watershed would be transferred to the Lake Ontario watershed.
	Connection to & Extension of Village of Montour Falls System	>\$2,000,000	Cost prohibitive and not viable as a long-term solution for well contamination
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Lewis Street Culvert Replacement		Village of Millport – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Lewis Street culvert installation lacks headwalls and guiderail. The current lack of headwalls deters from the hydraulic capacity of the installation and also does not adequately protect the roadway fill from erosion during highwater events. The lack of guiderail presents a safety issue for motorists.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Lewis Street culvert shall be replaced with a new steel culvert. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) and guide railing shall be installed. The existing roadway within the limits of construction shall be repaved.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm event (approx.)	Estimated Benefits (losses avoided)	A new culvert with headwalls and guiderail will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$30,500		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Village of Millport	Local Planning Mechanisms to be Used in Implementation, if any	Village Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culvert with box culvert	>\$50,000	More expensive than steel culvert option
	Eliminate Lewis Street Culvert	<\$20,000	Not practicable. Culvert crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Village of Millport – 4	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Village of Millport Administration	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Panther Lick Stream Stabilization Project		Village of Millport – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excess sediment directed to Catharine Creek tributary, resulting in downstream channel capacity issues and sediment introduced to Catharine Creek, a high-quality trout fishery. The existing Panther Lick near Dunn Road is unstable, resulting in excessive streambank erosion and erosion. This erosion and sedimentation results in sedimentation of downstream stream reaches, reducing channel capacity and negatively impacting trout habitat and spawning grounds.		
Action or Project Intended for Implementation			
Description of the Solution	Dimensional rock rip rap shall be strategically placed within and along Panther Lick to stabilize the streambanks and stream bed. In addition, plantings shall be integrated with the rock work.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	Medium	Estimated Benefits (losses avoided)	Reduced sediment load; improved trout habitat (including spawning grounds); Increased hydraulic capacity of downstream stream channel
Useful Life	50 years		
Estimated Cost	\$260,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grant and in-kind/local sources
Responsible Organization	Village of Millport	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Unacceptable erosion & sedimentation
	Replacement of Stream Channel with a large box culvert	>\$1,000,000	Elimination of stream would not be permissible with NYSDEC
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Floodplain Management		Village of Millport – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Village of Millport	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Village of Millport – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Village of Millport Flood Insurance Rate Maps were developed from a limited flood study and currently have no base flood elevations. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Village of Millport	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

TOWN OF SOUTHPORT

Emergency Generator for Town of Southport Town Hall		Town of Southport – 1	
Risk/Vulnerability			
Hazard of Concern	Flood, Thunderstorm, Winter Storm, Tornado		
Description of the Problem	During flooding, thunderstorm wind (including hail and lightning), severe winter storms and tornados, the Town Hall serves as the Emergency Operations Center (EOC) as well. Power outages are likely and render the facility useless. Within the Town Hall, there are lights, computers, heat, communications, etc., which all rely on electricity.		
Action or Project Intended for Implementation			
Description of the Solution	Installation of an emergency generator with hardwired quick connections for the Town Hall		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	The Town Hall and Emergency Operations Center will remain operational during power outages.
Useful Life	50 yrs.		
Estimated Cost	\$250,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Southport	Local Planning Mechanisms to be Used in Implementation, if any	Town improvements schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make building generator ready	\$100,000.00	Would still be without power until a generator from State is requested through Emergency Management.
	Try to find another facility with power to use as EOC	Dependent on facility being used	Would have to move all operations to another location. Impractical to move EOC to another location.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Town of Southport – 2	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Southport	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Stream Mitigation		Town of Southport – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Streams located on the Pennsylvania border to first bridge at Rt 328 and Rt 328 bridge to Penn Ave bridge have experienced significant erosion after previous flood events.		
Action or Project Intended for Implementation			
Description of the Solution	Streambank stabilization, detention basin creation, and gravel/debris removal will improve the integrity of the streams.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	Stream mitigation work will protect the roadway, resulting in improved reliability and safety for motorists.
Useful Life	60 years		
Estimated Cost	\$220,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Southport	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; repetitive damages and roadway repairs will continue
	Concrete lined roadside ditches	\$25,000,000	Not cost beneficial
	Proposed Action	\$220,000	Reduce or eliminate damages; protect motorists
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Buyout Damaged Properties		Town of Southport – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Homes have sustained repetitive flood losses. The Town of Southport has offered to assist the occupants with the buyout process. Will need to secure grant funding to proceed.		
Action or Project Intended for Implementation			
Description of the Solution	Buyout homes in the highest risk floodplain areas in order to relocate residents to safer locations, permanently eliminate the risk of repetitive damage to homes, and restore natural floodplain functions. The Town of Southport will identify willing sellers, pursue grant funding, and assist with the buyout process.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	Reduce the damage to residential property and the disruption to life caused by repeated flooding.
Useful Life	60 years		
Estimated Cost	>\$1,000,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Southport	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Continuing repetitive losses; Residents remain in harm's way; Emergency services required in high risk areas
	Relocate homes	>\$2,000,000	Less cost effective; Less feasible option due to age of structures
	Proposed Action	>\$1,000,000 (Depending on the number of willing participants)	Cost effective alternative; No residual risk
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Floodplain Management		Town of Southport – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Town of Southport	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Town of Southport – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Southport Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Southport	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

TOWN OF VAN ETTEN

Rumsey Hill Road Culvert Replacement		Town of Van Etten – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Rumsey Hill Road culvert is frequently overtopped during storm events, resulting in downstream damage. The hydraulic capacity of this structure does not comply with commonly accepted standards.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Rumsey Hill Road culvert shall be replaced with a new box culvert (of appropriate hydraulic capacity) to accommodate an appropriate design storm event return period. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) shall be installed.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new box culvert will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$250,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Van Etten	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culvert with bridge structure (concrete abutments & steel superstructure)	>\$330,000	More expensive than box culvert replacement
	Eliminate Rumsey Hill Road crossing	>\$20,000	Not practicable. Crossing is necessary to provide required roadway access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Cooper Hill Road Roadside Slope Stabilization		Town of Van Etten – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	A section of Cooper Hill Road is located at the top of a steep slope with a stream at the toe of this slope. This stream has/is eroding the toe of this slope, causing a slope failure that threatens the roadway of Cooper Hill Road. A collapse of the roadway would present hazards to motorists, as well as blocking emergency access routes.		
Action or Project Intended for Implementation			
Description of the Solution	To stabilize the slope failure, a reinforced soil slope shall be constructed to better support the roadway of Cooper Hill Road. In addition, the toe of the slope along the stream shall be armored with a stacked rock wall, to prevent erosion of the toe of slope.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A reinforced soil slope with a stacked rock wall at the toe of slope would stabilize the slope failure and would protect the roadway, resulting in improved reliability and safety for motorists.
Useful Life	60 years		
Estimated Cost	\$220,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Van Etten	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Utilization of driven sheet piling to construct a retaining wall system	>\$350,000	More expensive than the reinforced soil slope (with rock facing) alternative
	Eliminate portion of Rumsey Hill Road impacted by stream	>\$30,000	Not practicable. The roadway must be continuous to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Town of Van Etten – 3	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Van Etten	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Buyout Damaged Properties		Town of Van Etten – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Homes have sustained repetitive flood losses. The Town of Van Etten has offered to assist the occupants with the buyout process. Will need to secure grant funding to proceed.		
Action or Project Intended for Implementation			
Description of the Solution	Buyout homes in the highest risk floodplain areas in order to relocate residents to safer locations, permanently eliminate the risk of repetitive damage to homes, and restore natural floodplain functions. The Town of Van Etten will identify willing sellers, pursue grant funding, and assist with the buyout process.		
Is this Project related to a Critical Facility?		Yes	No
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	Reduce the damage to residential property and the disruption to life caused by repeated flooding.
Useful Life	60 years		
Estimated Cost	>\$1,000,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Van Etten	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Continuing repetitive losses; Residents remain in harm's way; Emergency services required in high risk areas
	Relocate homes	>\$2,000,000	Less cost effective; Less feasible option due to age of structures
	Proposed Action	>\$1,000,000 (Depending on the number of willing participants)	Cost effective alternative; No residual risk
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Town of Van Etten – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Van Etten Flood Insurance Rate Maps were developed from a limited flood study and currently have no base flood elevations. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Van Etten	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

TOWN OF VETERAN

Birch Hill Road Landslide		Town of Veteran – 1	
Risk/Vulnerability			
Hazard of Concern	Landslide		
Description of the Problem	An active landslide along Birch Hill Road results in substantial earth flows onto this road, blocking the road and presenting a safety hazard to motorists. In addition, earth flows from the landslide enters a tributary to Catharine Creek, a high-quality trout fishery.		
Action or Project Intended for Implementation			
Description of the Solution	The landslide would be mitigated through a combination of regrading (flattening the land slope), geotechnical approaches (including the use of geogrid), and drainage improvements.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25 year	Estimated Benefits (losses avoided)	More reliable roadway system, safer conditions for motorists, and reduced silt and sediment to Catharine Creek
Useful Life	75 years		
Estimated Cost	\$750,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	With 5-year period
Estimated Time Required for Project Implementation	3 years	Potential Funding Sources	Grants, Local funding sources
Responsible Organization	Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$15,000/year	Continued safety & environmental issues
	Abandonment of Birch Hill Road	\$2,500	Problematic for residents and emergency vehicles
	Proposed Action	\$750,000	Reduce flooding, Protect residents
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

New Salt Storage Facility		Town of Veteran – 2	
Risk/Vulnerability			
Hazard of Concern	Winter Storm		
Description of the Problem	Existing salt storage facility is inadequate in design due to the age of the structure and current required capacity. Its reliability is questionable during large snow storm events. Also, salt-laden runoff from the site may be negatively impacting adjacent properties. The existing salt storage facility is inadequately designed for current requirements and usage, which compromises the ability of the Town to manage the road system properly during a snow storm. Also, salt-laden runoff is reaching adjacent properties, negatively impacting these.		
Action or Project Intended for Implementation			
Description of the Solution	The replacement of the existing salt storage facility (which is constructed of wood) with a new salt storage facility. The new salt storage facility would be included concrete foundation walls and a steel-framed, fabric-covered building superstructure.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	500 year	Estimated Benefits (losses avoided)	Benefits include reduced pollutants to off-site areas and improved reliability for proper winter maintenance of public thoroughfares.
Useful Life	40 years		
Estimated Cost	\$400,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	With 5 years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, Local Sources
Responsible Organization	Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Upgrade/retrofit existing Salt Storage Facility	>\$500,000	Condition of exg. Building is beyond repair
	Installation of wood structure salt storage facility	>\$500,000	More expensive than steel-frame fabric-covered building
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Panther Lick Stream Stabilization Project		Town of Veteran – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excess sediment directed to Catharine Creek tributary, resulting in downstream channel capacity issues and sediment introduced to Catharine Creek, a high-quality trout fishery. The existing Panther Lick near Dunn Road is unstable, resulting in excessive streambank erosion and erosion. This erosion and sedimentation results in sedimentation of downstream stream reaches, reducing channel capacity and negatively impacting trout habitat and spawning grounds.		
Action or Project Intended for Implementation			
Description of the Solution	Dimensional rock rip rap shall be strategically placed within and along Panther Lick to stabilize the streambanks and stream bed. In addition, plantings shall be integrated with the rock work.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	Medium	Estimated Benefits (losses avoided)	Reduced sediment load; improved trout habitat (including spawning grounds); Increased hydraulic capacity of downstream stream channel
Useful Life	50 years		
Estimated Cost	\$260,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grant and in-kind/local sources
Responsible Organization	Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Unacceptable erosion & sedimentation
	Replacement of Stream Channel with a large box culvert	>\$1,000,000	Elimination of stream would not be permissible with NYSDEC
	Proposed Action	\$260,000	Reduce flooding
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Terry Hill Road Bridge Replacement		Town of Veteran – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Terry Hill Road Bridge is old and is in poor structural condition. This poor structural condition jeopardizes motorist safety and roadway system reliability. The existing Terry Hill Road Bridge is old and is in poor structural condition. This poor structural condition jeopardizes motorist safety and roadway system reliability.		
Action or Project Intended for Implementation			
Description of the Solution	The existing bridge structure would be demolished and replaced with a new concrete box culvert.		
Is this Project related to a Critical Facility?		Yes	No <input checked="" type="checkbox"/>
Level of Protection	100-Year	Estimated Benefits (losses avoided)	2-lane bridge (in lieu of a signal lane), improved safety for motorists, improved reliability of roadway system
Useful Life	50 Years		
Estimated Cost	\$500,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	3-year period	Potential Funding Sources	Grants and Local Funding Sources
Responsible Organization	Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Unacceptable risks for motorists
	Elimination of bridge	\$10,000	Unacceptable inconvenience for residents & Delays for emergency vehicles
	Proposed Action	\$500,000	Protect lives; Reduce potential damages
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Town of Veteran – 5	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Floodplain Management		Town of Veteran – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Town of Veteran – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Veteran Flood Insurance Rate Maps were developed from a limited flood study and currently have no base flood elevations. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

VILLAGE OF WELLSBURG

Emergency Generator for Fire Station		Village of Wellsburg – 1	
Risk/Vulnerability			
Hazard of Concern	Flood, Thunderstorm, Winter Storm, Tornado		
Description of the Problem	During flooding, thunderstorm wind events (including hail and lightning), severe winter storms and tornados, the Fire Station serves as the Emergency Operations Center as well. Power outages are likely and render the facility useless. There are no lights, computers, heat, communications- all rely on electricity.		
Action or Project Intended for Implementation			
Description of the Solution	Install emergency generator with hardwired quick connections.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	The Fire Station and Emergency Operations Center will remain operational during power outages.
Useful Life	50 yrs.		
Estimated Cost	\$200,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Village of Wellsburg	Local Planning Mechanisms to be Used in Implementation, if any	Village improvements schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make building generator ready	\$100,000.00	Would still be without power until a generator from State is requested through Emergency Management.
	Try to find another facility with power to use as EOC	Dependent on facility being used	Would have to move all operations to another location. Impractical to move Fire Dept. ops out of Village.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Tyler Run (Creek) Relocation / Realignment		Village of Wellsburg – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	During larger storm events, Tyler Run inundates both Church and Front Streets within the Village of Wellsburg, resulting in the flooding of businesses and residences.		
Action or Project Intended for Implementation			
Description of the Solution	Work with Chemung County Soil and Water to realign Tyler Run in a direct route to Bentley Creek and away from Village residences and businesses.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	100-year storm	Estimated Benefits (losses avoided)	This project would significantly reduce the flooding experienced in the Village, especially for the homes and businesses on Front and Church Streets.
Useful Life	50 yrs.		
Estimated Cost	\$400,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding
Responsible Organization	Village of Wellsburg	Local Planning Mechanisms to be Used in Implementation, if any	Soil and Water District work schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Improvements to increase capacity of existing channel and culverts	\$650,000	Work would involve replacement of existing culverts and work on private property.
	Installation of flood control reservoir in the Tyler Run watershed	\$1,000,000	Work would involve construction of reservoir on private property. Reservoir would be a high hazard dam.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Automated Rain Gauge and Stream Gauge for Bentley Creek		Village of Wellsburg – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Bentley Creek flows through the Village from the south. Often the upstream region gets significantly heavy rain events that are not as heavy for the Village of Wellsburg, resulting in unexpected flash flooding for the Village of Wellsburg.		
Action or Project Intended for Implementation			
Description of the Solution	Install a precipitation and stream gauge upstream of Wellsburg to alert the Village when heavy rain or sharp stream rises are occurring to the south. The Village could have some advanced warning of possible flash flooding and could better respond to these events. These gauges could be networked into a regional gauge system for better situational awareness for other agencies as well.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	Up to 100-year storm	Estimated Benefits (losses avoided)	Would allow for advanced warning of rises in the Bentley Creek due to heavy rain events upstream. Allows Village to better warn and prepare residents for possible flash flooding..
Useful Life	30 years		
Estimated Cost	\$30,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding, possible assistance from Environmental Emergency Services (EES)
Responsible Organization	Village of Wellsburg	Local Planning Mechanisms to be Used in Implementation, if any	Village work plan and EES work plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Installation of a staff gauge in Creek and recruiting/training of select residents to be rain gauge readers/reporters	\$5000.00	Would need to rely on residents to install gauges correctly, and correctly read/report rain and stream gauge levels, in a timely manner if we are to warn residents
	Pursue the PL-566 proposal for a flood control levee on Bentley Creek	Several Million Dollars	Village has not been able to support this proposal historically due to lack of funding. Need financial assistance.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Public Education and Outreach		Village of Wellsburg – 4	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Village of Wellsburg Administration	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Floodplain Management		Village of Wellsburg – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Village of Wellsburg	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 12: MITIGATION ACTIONS

Flood Study and Mapping		Village of Wellsburg – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Village of Wellsburg Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Village of Wellsburg	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

SECTION 13: PLAN MAINTENANCE

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PLAN MAINTENANCE PROCEDURES

The following is an explanation of how Chemung County, participating jurisdictions, and the general public will be involved in implementing, evaluating, and enhancing the Plan over time. The sustained hazard mitigation planning process consists of four main parts:

- Incorporation
- Monitoring and Evaluation
- Updating
- Continued Public Involvement

INCORPORATION

Chemung County and participating jurisdictions will be responsible for further development and implementation of mitigation actions. Each action has been assigned to a specific department within the County and participating jurisdictions. The following describes the process by which Chemung County will incorporate elements of the mitigation plan into other planning mechanisms.

PROCESS OF INCORPORATION

Once the Plan is adopted, Chemung County and participating jurisdictions will implement actions based on priority and the availability of funding. The County currently implements policies and programs to reduce loss to life and property from hazards. The mitigation actions developed for this Plan enhance this ongoing effort and will be implemented through other program mechanisms where possible.

The potential funding sources listed for each identified action may be used when the jurisdiction seeks funds to implement actions. An implementation time period or a specific implementation date has been assigned to each action as an incentive for completing each task and gauging whether actions are implemented in a timely manner.

SECTION 13: PLAN MAINTENANCE

Chemung County and participating jurisdictions will integrate implementation of their mitigation actions with other plans and policies, such as construction standards and emergency management plans, and ensure that these actions, or proposed projects, are reflected in other planning efforts. Coordinating and integrating components of other plans and policies into goals and objectives of the Plan will further maximize funding and provide possible cost-sharing of key projects. This coordination and integration will thereby be reducing loss of lives and property and mitigating hazards affecting the area.

Upon formal adoption of the Plan, planning team members from each participating jurisdiction will work to integrate the hazard mitigation strategies into other plans and codes as they are developed. Participating team members will conduct periodic reviews of plans and policies, once per year at a minimum, and analyze the need for amendments in light of the approved Plan. The planning team will review all comprehensive land use plans, capital improvement plans, annual budget reviews, emergency operations or management plans, transportation plans, and any building codes to guide and control development. Participating jurisdictions will ensure that capital improvement planning in the future will also contribute to the goals of this hazard mitigation Plan to reduce the long-term risk to life and property from all hazards. Within one year of formal adoption of the hazard mitigation plan, existing planning mechanisms will be reviewed by each jurisdiction.

Chemung County is committed to supporting the cities, communities, and participating jurisdictions as they implement their mitigation actions. Chemung County and participating planning team members will review and revise, as necessary, the long-range goals and objectives in strategic plan and budgets to ensure that they are consistent with this mitigation action plan. Additionally, the County will work to advance the goals of this hazard mitigation plan through its routine, ongoing, long-range planning, budgeting, and work processes.

Table 13-1 identifies types of planning mechanisms and examples of methods for incorporating the Plan into other planning efforts. The team members, listed in Table 13-2 below, will be responsible for the review of these planning mechanisms and their incorporation of the plan, with the exception of the Floodplain Management Plans. The jurisdictions who have a Floodplain Administrator on staff will be responsible for incorporating the plan when floodplain management plans are updated, or new plans are developed.

Table 13-1. Methods of Incorporation of the Plan

PLANNING MECHANISM	DEPARTMENT/TITLE RESPONSIBLE	INCORPORATION OF PLAN
Annual Budget Review	Chemung County: Director of Fire and Emergency Management Services Each jurisdiction: Mayor/Supervisor	Various departments and key personnel that participated in the planning process for Chemung County and participating jurisdictions will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought, and mitigation actions that will be undertaken, according to the implementation schedule of the specific action.
Capital Improvement Plans	Chemung County: County Executive Each jurisdiction: Chief Elected Officials	Chemung County and participating jurisdictions have a Capital Improvement Plan (CIP) in place. Prior to any revisions to the CIP, County and City departments

SECTION 13: PLAN MAINTENANCE

PLANNING MECHANISM	DEPARTMENT/TITLE RESPONSIBLE	INCORPORATION OF PLAN
		will review the risk assessment and mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.
Comprehensive Plans	Chemung County: Director of Fire and Emergency Management Services Each jurisdiction: Mayor/Supervisor	Chemung County has a Long-term Comprehensive Emergency Management Plan in place. Since comprehensive plans involve developing a unified vision for a community, the mitigation vision and goals of the Plan will be reviewed in the development or revision of a Comprehensive Plan.
Floodplain Management Plans	Chemung County: Floodplain Manager	Floodplain management plans include preventative and corrective actions to address the flood hazard. Therefore, the actions for flooding, and information found in Section 5 of this Plan discussing the people and property at risk to flood, will be reviewed and revised when Chemung County updates their management plans or develops new plans.
Grant Applications	Chemung County: Director of Fire and Emergency Management Services Each jurisdiction: Mayor/Supervisor	The Plan will be evaluated by Chemung County and participating jurisdictions when grant funding is sought for mitigation projects. If a project is not in the Plan, an amendment may be necessary to include the action in the Plan.
Regulatory Plans	Chemung County: County Executive Each jurisdiction: Chief Elected Officials	Currently, Chemung County and participating jurisdictions have regulatory plans in place, such as Emergency Operations Plans, Continuity of Operations Plans, Economic Development, and Evacuation Plans. The Plan will be consulted when County and City departments review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.

MONITORING AND EVALUATION

Periodic revisions of the Plan are required to ensure that goals, objectives, and mitigation actions are kept current. Revisions may be required to ensure the Plan is in compliance with federal and state statutes and regulations. This section outlines the procedures for completing Plan revisions, updates, and review. Table 13-2 indicates the department and title of the party responsible for Plan monitoring, evaluating, updating, and review of the Plan.

Table 13-2. Team Members Responsible for Plan Monitoring, Evaluating, Updating, and Review of the Plan

JURISDICTION	TITLE
Chemung County	Director of Fire and Emergency Management Services
Town of Ashland	Mayor/Supervisor
Town of Baldwin	Mayor/Supervisor
Town of Big Flats	Mayor/Supervisor
Town of Catlin	Mayor/Supervisor
Town of Chemung	Mayor/Supervisor
City of Elmira	Mayor
Town of Elmira	Mayor/Supervisor
Village of Elmira Heights	Mayor/Supervisor
Town of Erin	Mayor/Supervisor
Town of Horseheads	Mayor/Supervisor
Village of Horseheads	Deputy Mayor
Village of Millport	Mayor/Supervisor
Town of Southport	Mayor/Supervisor
Town of Van Etten	Mayor/Supervisor
Town of Veteran	Mayor/Supervisor
Village of Wellsburg	Mayor/Supervisor

MONITORING

Designated Planning Team members are responsible for monitoring, updating, and reviewing the Plan, as shown in Table 13-2. Individuals holding the title listed in Table 13-2 will be responsible for monitoring the Plan on an annual basis. Plan monitoring includes reviewing and incorporating into the Plan other existing planning mechanisms that relate or support goals and objectives of the Plan; monitoring the incorporation of the Plan into future updates of other existing planning mechanisms as appropriate; reviewing mitigation actions submitted and coordinating with various County and City departments to determine if mitigation actions need to be re-evaluated and updated; evaluating the hazards that pose a risk to the planning area and updating the risk assessment when warranted; evaluating and updating the Plan as necessary; and monitoring plan maintenance to ensure that the process described is being followed, on an annual basis, throughout the planning process. The Planning Team will develop a brief report that identifies policies and actions in the plan that have been successfully implemented and any changes in the implementation process needed for continued success. A summary of meeting notes will report the particulars involved in

SECTION 13: PLAN MAINTENANCE

developing an action into a project. In addition to the annual monitoring, the Plan will be similarly reviewed immediately after extreme weather events including but not limited to state and federally declared disasters.

EVALUATION

As part of the evaluation process, the Planning Team will assess changes in risk; determine whether the implementation of mitigation actions is on schedule; determine whether there are any implementation problems, such as technical, political, legal, or coordination issues; and identify changes in land development or programs that affect mitigation priorities for each respective department or organization.

The Planning Team will meet on an annual basis to evaluate the Plan, identify any needed changes, and assess the effectiveness of the plan achieving its stated purpose and goals. The team will evaluate the number of mitigation actions implemented along with the loss-reduction associated with each action. Actions that have not been implemented will be evaluated to determine if any social, political or financial barriers are impeding implementation and if any changes are necessary to improve the viability of an action. The team will evaluate changes in land development and/or programs that affect mitigation priorities in their respective jurisdictions. The annual evaluation process will help to determine if any changes are necessary. In addition, the Plan will be similarly evaluated immediately after extreme weather events including but not limited to state and federally declared disasters.

UPDATING

PLAN AMENDMENTS

At any time, minor technical changes may be made to update the Chemung County Hazard Mitigation Plan. Material changes to mitigation actions or major changes in the overall direction of the Plan or the policies contained within it must be subject to formal adoption by the County and participating jurisdictions.

The County will review proposed amendments and vote to accept, reject, or amend the proposed change. Upon ratification, the amendment will be transmitted to the office of the Director of Fire and Emergency Management.

In determining whether to recommend approval or denial of a Plan amendment request, the County will consider the following factors:

- Errors or omissions made in the identification of issues or needs during the preparation of the Plan;
- New issues or needs that were not adequately addressed in the Plan; and
- Changes in information, data, or assumptions from those on which the Plan was based.

FIVE (5) YEAR REVIEW

The Plan will be thoroughly reviewed by the Planning Team at the end of three years from the approval date, to determine whether there have been significant changes in the planning area that necessitate changes in the types of mitigation actions proposed. Factors that may affect the content of the Plan include new development in identified hazard areas, increased exposure to hazards, disaster declarations, increase or decrease in capability to address hazards, and changes to federal or state legislation.

The Plan review process provides the County and participating jurisdictions an opportunity to evaluate mitigation actions that have been successful, identify losses avoided due to the implementation of specific mitigation measures, and address mitigation actions that may not have been successfully implemented as assigned.

SECTION 13: PLAN MAINTENANCE

It is recommended that the full Planning Team (Section 2, Table 2-1) meet to review the Plan at the end of three years because grant funds may be necessary for the development of a five-year update. Reviewing planning grant options in advance of the five-year Plan update deadline is recommended considering the timelines for grant and planning cycles can be in excess of a year.

Following the Plan review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and Plan amendment process outlined herein. Upon completion of the review, update, and amendment process, the revised Plan will be submitted to NYS DHSES for final review and approval in coordination with FEMA.

CONTINUED PUBLIC INVOLVEMENT

Public input was an integral part of the preparation of this Plan and will continue to be essential for Plan updates. The Public will be directly involved in the annual review and cyclical updates. Changes or suggestions to improve or update the Plan will provide opportunities for additional public input.

The public can review the Plan on Chemung County's website along with a hard copy at the Chemung Office of Emergency Management. Annual meeting will be held that the public will be invited to attend.

The Planning Team may also designate voluntary citizens from the County or willing stakeholder members from the private sector businesses that were involved in the Plan's development to provide feedback on an annual basis. It is important that stakeholders and the immediate community maintain a vested interest in preserving the functionality of the planning area as it pertains to the overall goals of the mitigation plan. The Planning team is responsible for notifying stakeholders and community members on an annual basis and maintaining the Plan.

Media, including local newspaper and radio stations, will be used to notify the public of any maintenance or periodic review activities during the implementation, monitoring, and evaluation phases. Additionally, local news media will be contacted to cover information regarding Plan updates, status of grant applications, and project implementation. Local and social media outlets, such as Facebook and Twitter, will keep the public and stakeholders apprised of potential opportunities to fund and implement mitigation projects identified in the Plan.

APPENDIX A: PLANNING TEAM

Planning Team Members	1
Stakeholders	3

PLANNING TEAM MEMBERS

The Chemung County Plan was organized using a direct representative model. A Planning Team from Chemung County and participating jurisdictions, shown in Table A-1, was formed to coordinate planning efforts and request input and participation in the planning process. The Planning Team consists of representatives from area organizations and departments that participated throughout the planning process. Table A-2 is comprised of stakeholders who were invited to provide Plan input. Public outreach efforts and meeting documentation is provided in Appendix E.

Table A-1. Planning Team

DEPARTMENTS	TITLE
Chemung County	Director of Fire and Emergency Management
Chemung County	Deputy Director of Fire and Emergency Management
Chemung County	Administrative Assistant of Fire and Emergency Management
Chemung County	Public Work Commissioner
Town of Ashland	Supervisor
Town of Ashland	Highway Superintendent
Town of Ashland	Code Enforcement Officer
Town of Baldwin	Supervisor
Town of Baldwin	Highway Superintendent
Town of Baldwin	Code Enforcement Officer
Town of Big Flats	Supervisor
Town of Big Flats	Highway Superintendent
Town of Big Flats	Code Enforcement Officer
Town of Catlin	Supervisor
Town of Catlin	Highway Superintendent
Town of Catlin	Code Enforcement Officer
Town of Chemung	Supervisor

APPENDIX A: PLANNING TEAM

DEPARTMENTS	TITLE
Town of Chemung	Highway Superintendent
Town of Chemung	Code Enforcement Officer
City of Elmira	Mayor
City of Elmira	City Manager
City of Elmira	Public Works Director
City of Elmira	Public Works Supervisor
City of Elmira	Code Enforcement Director
Town of Elmira	Supervisor
Town of Elmira	Highway Superintendent
Town of Elmira	Code Enforcement Officer
Village of Elmira Heights	Mayor
Village of Elmira Heights	Director of Public Works
Village of Elmira Heights	Code Enforcement Officer
Town of Erin	Supervisor
Town of Erin	Highway Superintendent
Town of Erin	Deputy Highway Superintendent
Town of Erin	Code Enforcement Officer
Town of Horseheads	Supervisor
Town of Horseheads	Deputy Supervisor
Town of Horseheads	Highway Superintendent
Town of Horseheads	Deputy Highway Superintendent
Town of Horseheads	Code Enforcement Director
Village of Horseheads	Mayor
Village of Horseheads	Village Manager
Village of Horseheads	Director of Public Works
Village of Horseheads	Code Enforcement Officer
Village of Horseheads	Village Board Trustee

APPENDIX A: PLANNING TEAM

DEPARTMENTS	TITLE
Village of Horseheads	Village Board Trustee
Village of Millport	Mayor
Village of Millport	Code Enforcement Officer
Town of Southport	Supervisor
Town of Southport	Deputy Supervisor
Town of Southport	Highway Superintendent
Town of Southport	Code Enforcement Officer
Town of Van Etten	Supervisor
Town of Van Etten	Deputy Supervisor
Town of Van Etten	Highway Superintendent
Town of Van Etten	Code Enforcement Officer
Town of Van Etten	Town Clerk
Town of Veteran	Supervisor
Town of Veteran	Highway Superintendent
Town of Veteran	Code Enforcement Officer
Village of Wellsburg	Mayor
Village of Wellsburg	Village Clerk
Village of Wellsburg	Code Enforcement Officer

STAKEHOLDERS

The following groups listed in Table A-2 represent a list of organizations invited to stakeholder meetings, public meetings, and workshops throughout the planning process and include non-profit organizations, private businesses, universities, and legislators. The public were also invited to participate via e-mail throughout the planning process. For a list of attendees at meetings, please see Appendix E¹.

¹ Information contained in Appendix E is exempt from public release under the Freedom of Information Act (FOIA).

Table A-2. Stakeholders

AGENCY	TITLE
Able 2	Residential Services
Able 2	Environmental Services
AIM Independent Living Center	Executive Director
Arnot Hospital/St. Joseph Hospital	Emergency Manager/Security
Capabilities	Vocational Services
Chemung ARC	Emergency Planning
Chemung County Chamber of Commerce	President and Chief Executive Officer
Corning Hospital	Emergency Planner
County Soil & Water Conservation District	Mitigation Coordinator
Economic Opportunity Program	Chief Executive Officer
Elmira College	Office of Student Life
Elmira School District	Superintendent
Elmira Heights School District	Superintendent
Food Bank of the Southern Tier	President and Chief Executive Officer
Horseheads School District	Superintendent
Spencer-Van Etten School District	Superintendent
Southern Tier Association for the Visually Impaired	President and Chief Executive Officer
Southern Tier Economic Growth	Executive Director
STC BOCES	District Superintendent
STC Regional Planning and Development Board	Executive Director
STC Regional Planning and Development	Tri-county Flood Mitigation Specialist
Stormwater Coalition	Stormwater Coalition
United Way of the Southern Tier	Chief Executive Officer
Village of Van Etten	Mayor
Village of Van Etten	Highway Superintendent
Village of Van Etten	Code Enforcement Officer

APPENDIX B: PUBLIC SURVEY RESULTS

Overview	1
Public Survey Results	2

OVERVIEW

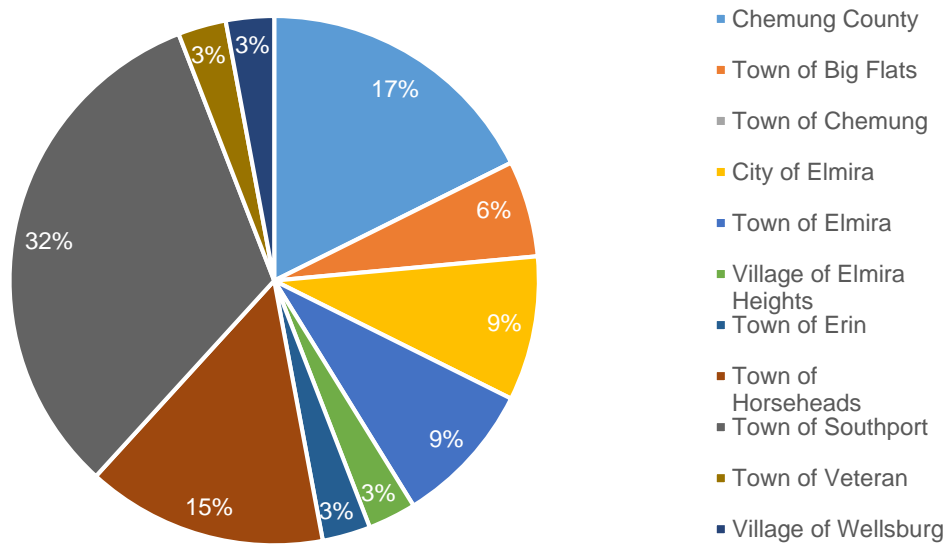
Chemung County prepared a public survey that requested public opinion on a wide range of questions relating to natural hazards. The survey was made available on the County's website, along with participating jurisdictions. This survey link was also distributed at public meetings and stakeholder events throughout the planning process.

A total of 34 surveys were collected, the results of which are analyzed in Appendix B. The purpose of the survey was twofold: 1) to solicit public input during the planning process, and 2) to help the jurisdictions identify any potential actions or problem areas.

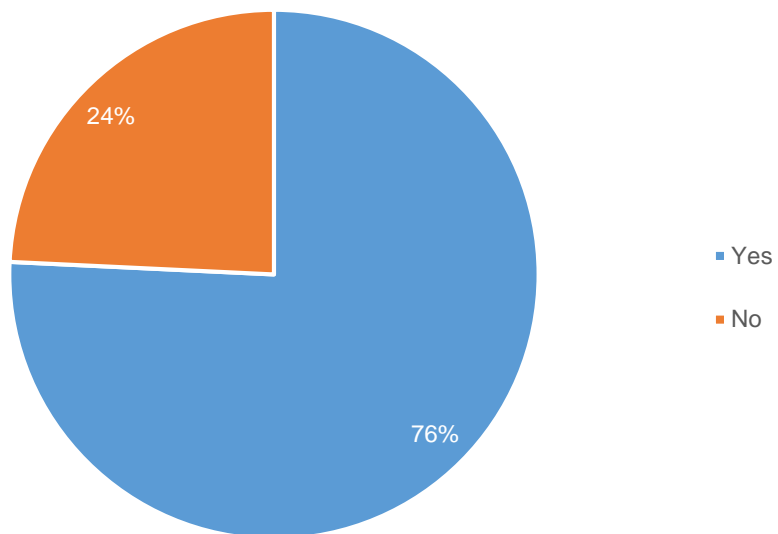
The following survey results depict the percentage of responses for each answer. Similar responses have been summarized for questions that did not provide a multiple-choice answer or that required an explanation.

PUBLIC SURVEY RESULTS

1. Please state the jurisdiction (city and community) where you reside.

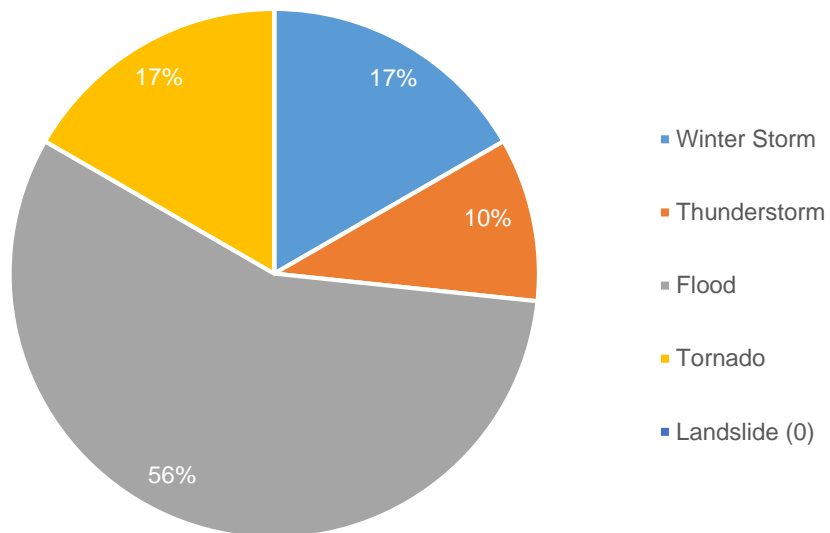


2. A. Have you ever experienced or been impacted by a disaster?

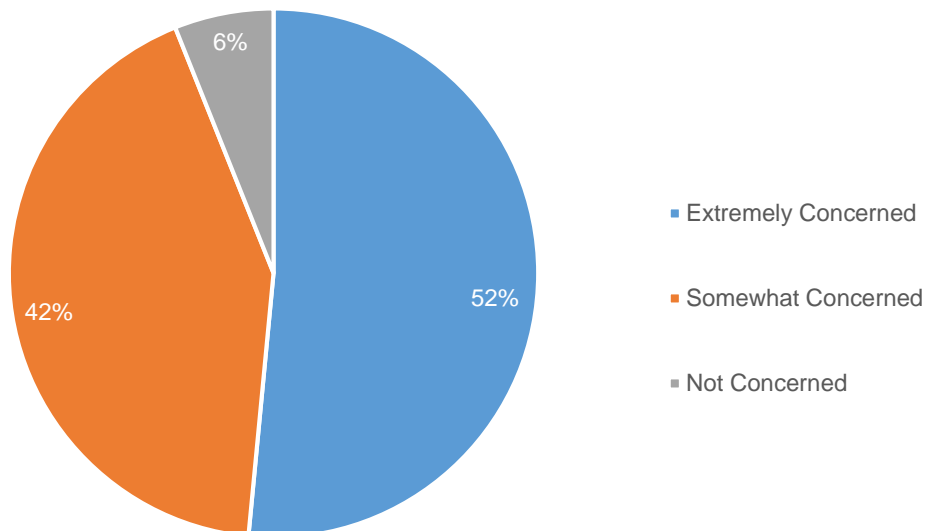


APPENDIX B: PUBLIC SURVEY RESULTS

2. B. If “Yes”, please explain:

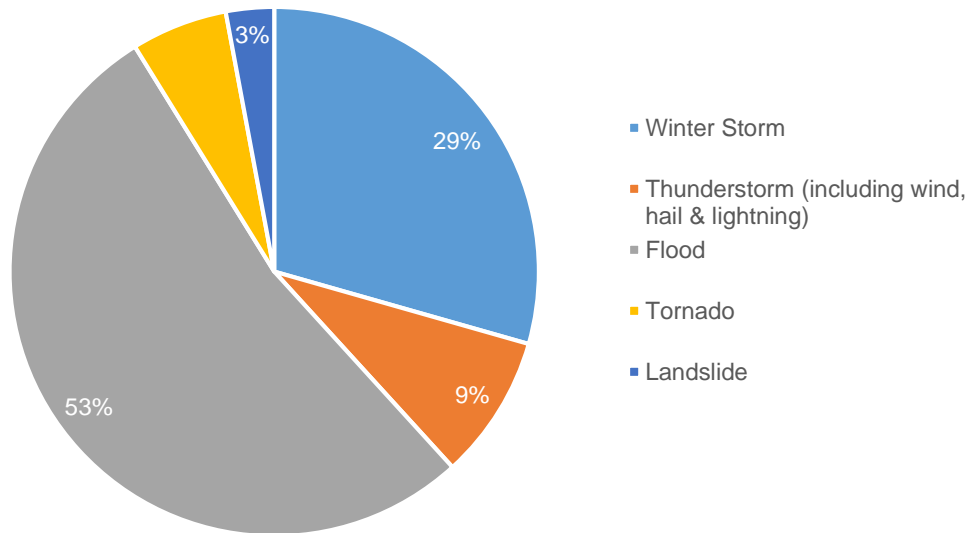


3. How concerned are you about the possibility of your community being impacted by a disaster?

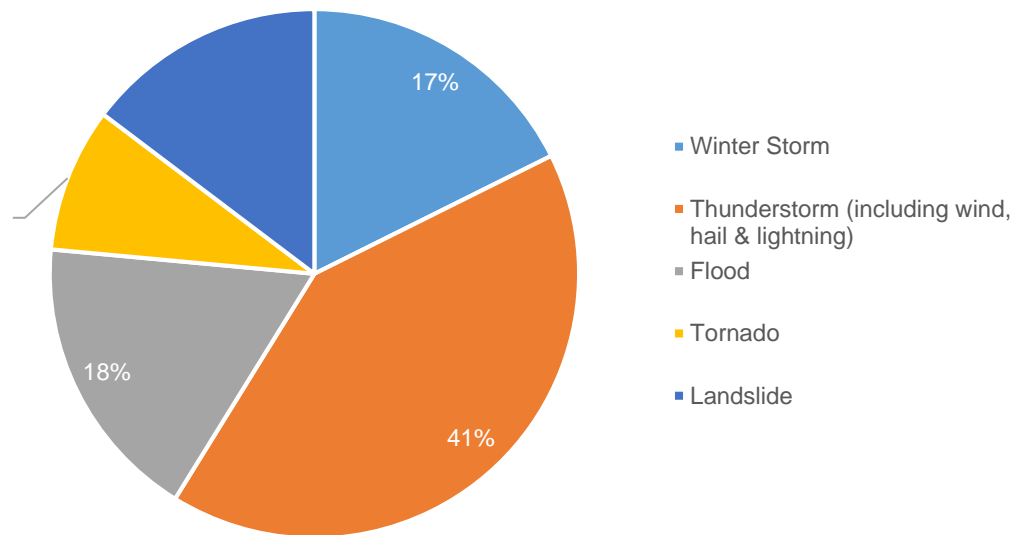


APPENDIX B: PUBLIC SURVEY RESULTS

4. Please select the one hazard you think is the highest threat to your neighborhood:

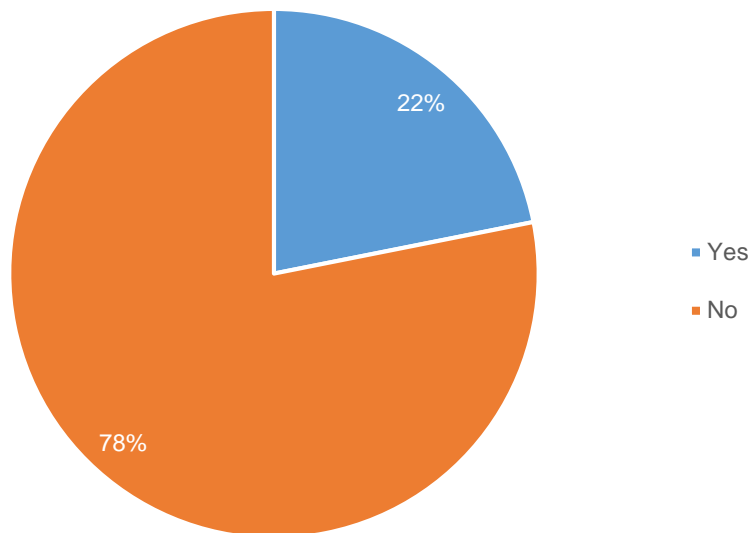


5. Please select the one hazard you think is the second highest threat to your neighborhood:

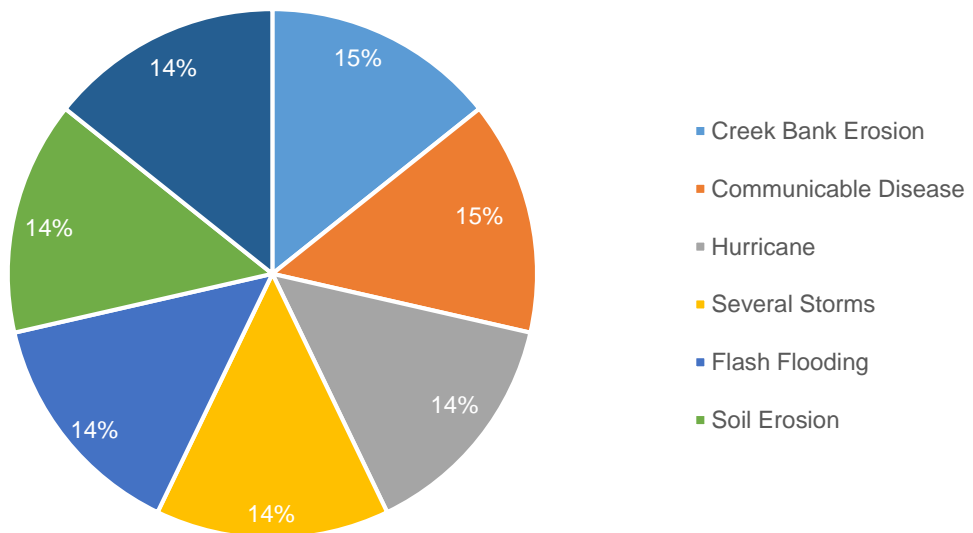


APPENDIX B: PUBLIC SURVEY RESULTS

6. A. Are there hazards not listed above that you think are a wild-scale threat to your neighborhood?

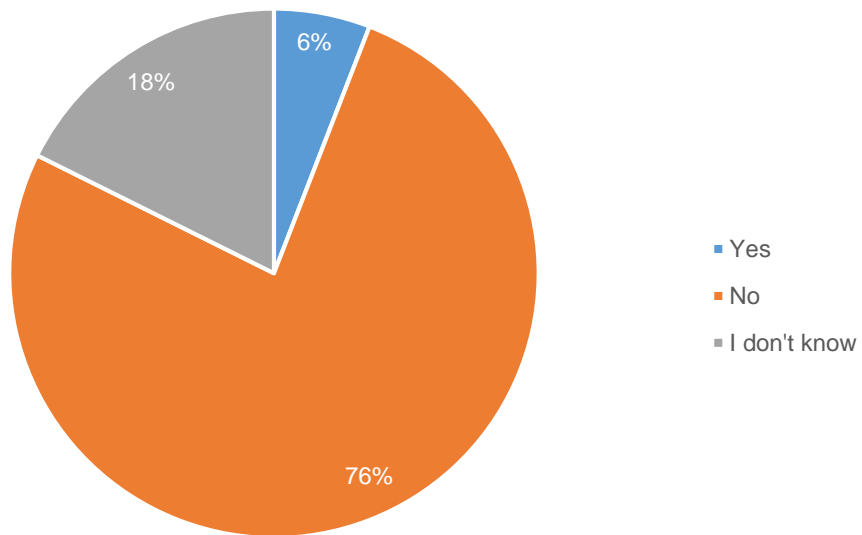


6. B. If "Yes", please explain:

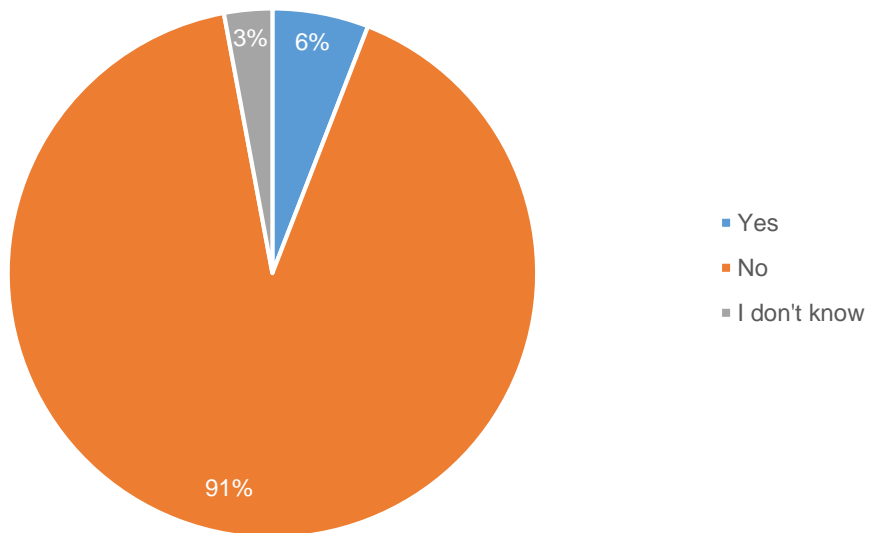


APPENDIX B: PUBLIC SURVEY RESULTS

7. Is your home located in a floodplain?

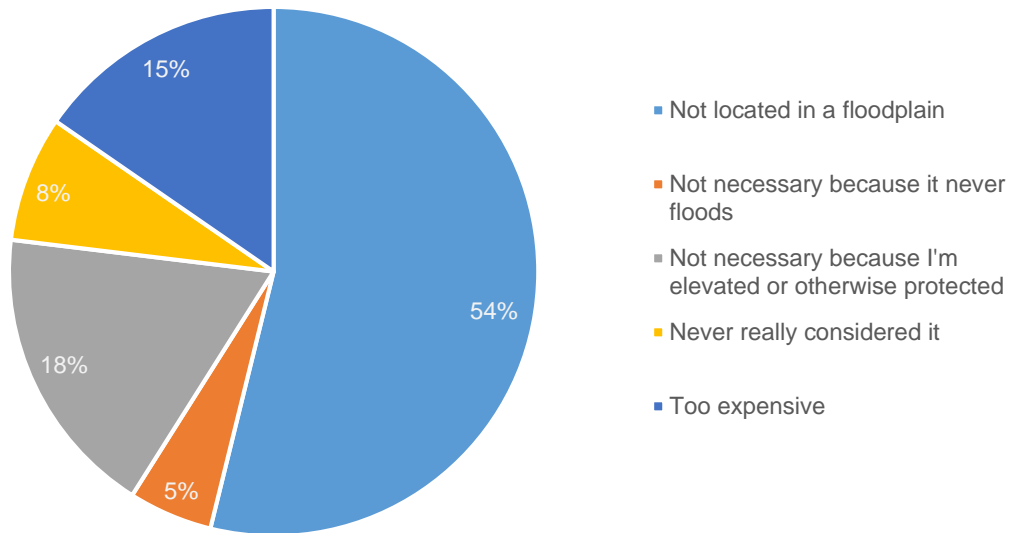


8. Do you have flood insurance?

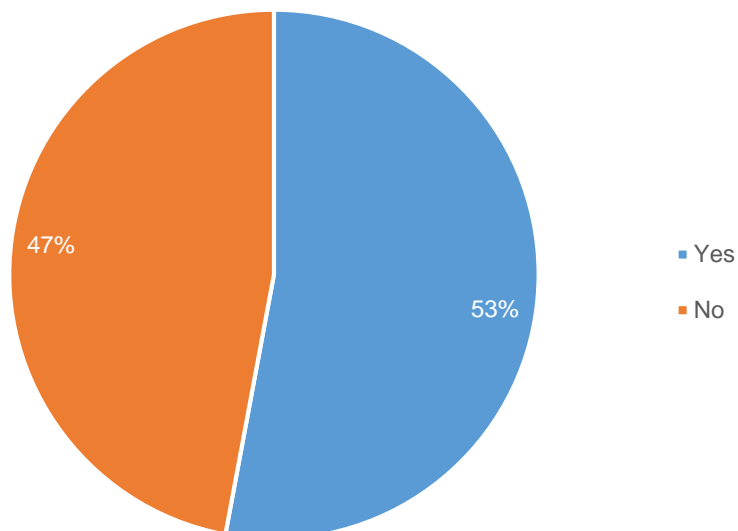


APPENDIX B: PUBLIC SURVEY RESULTS

9. If you do not have flood insurance, why not?

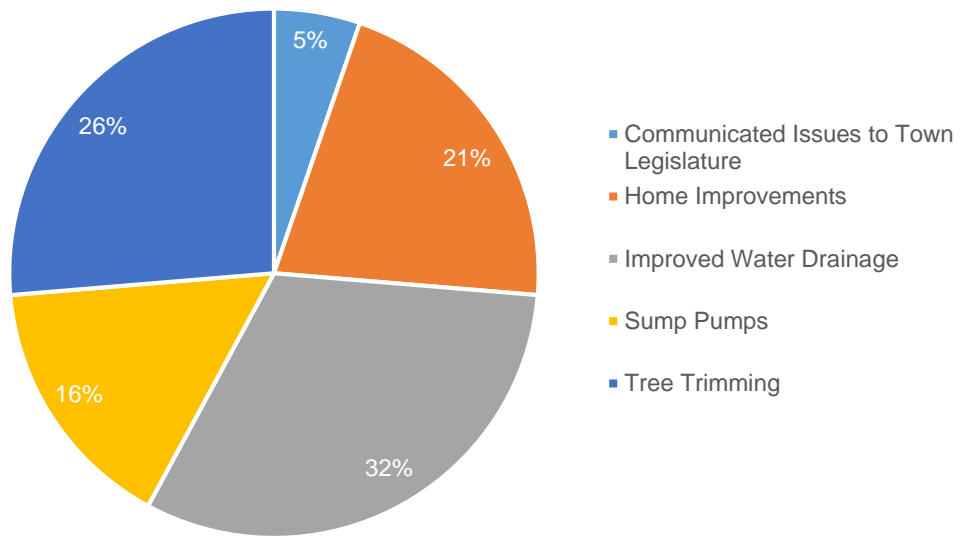


10. A. Have you taken any actions to make sure your home or neighborhood is more resistant to hazards?

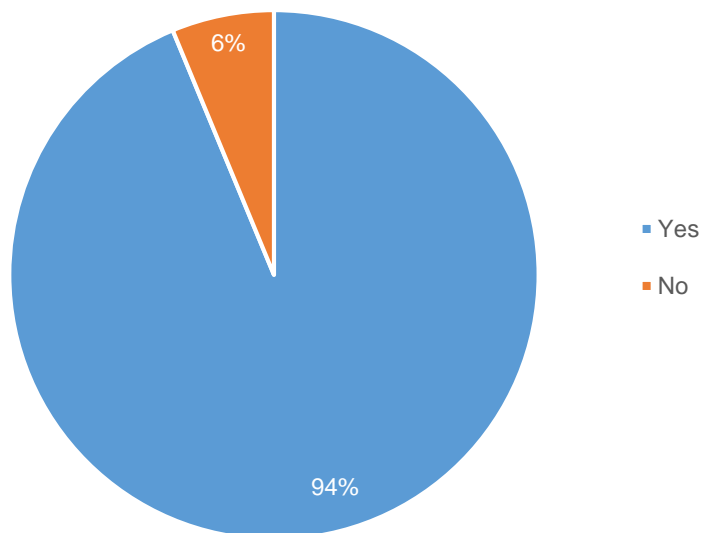


APPENDIX B: PUBLIC SURVEY RESULTS

10. B. What have you done?

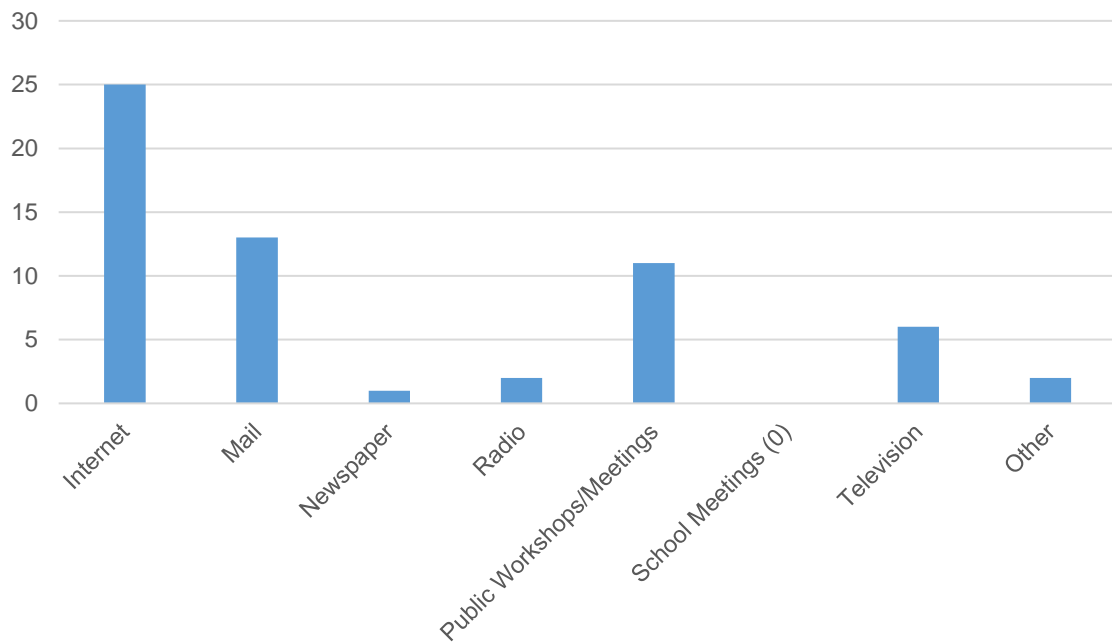


11. Are you interested in making your home or neighborhood more resistant to hazards?

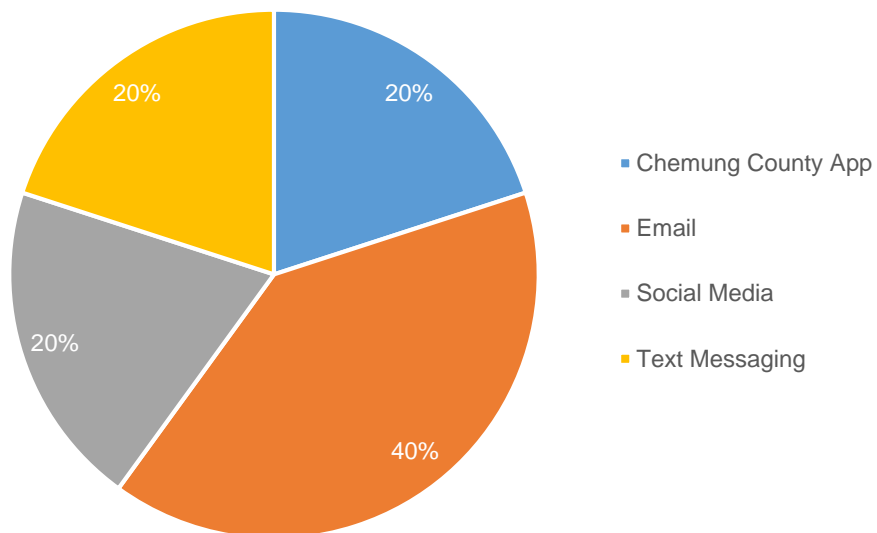


APPENDIX B: PUBLIC SURVEY RESULTS

12. A. What is the most effective way for you to receive information about how to make your home or neighborhood more resistant to hazards?

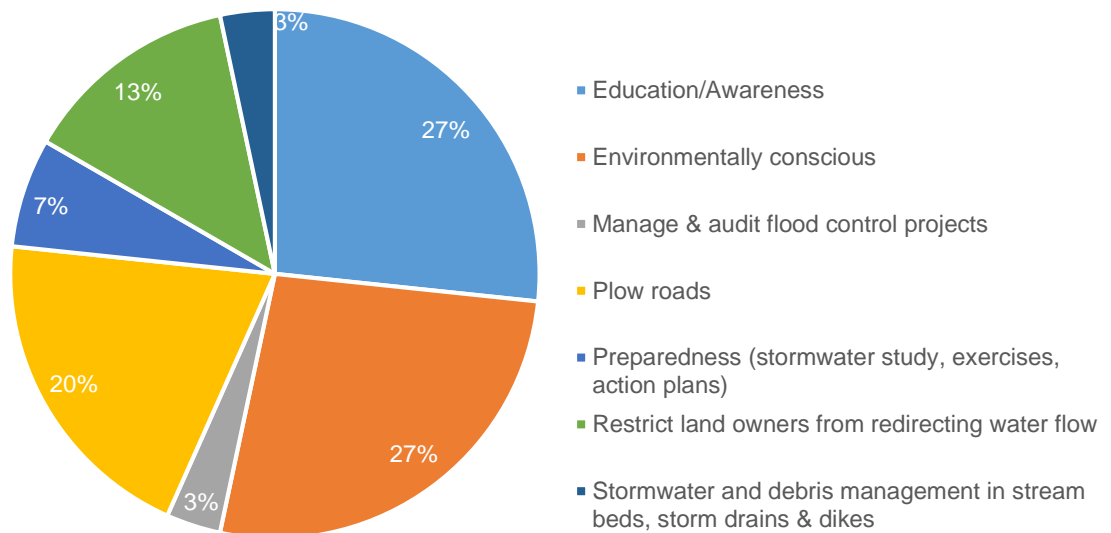


12. B. If "Other", please specify.

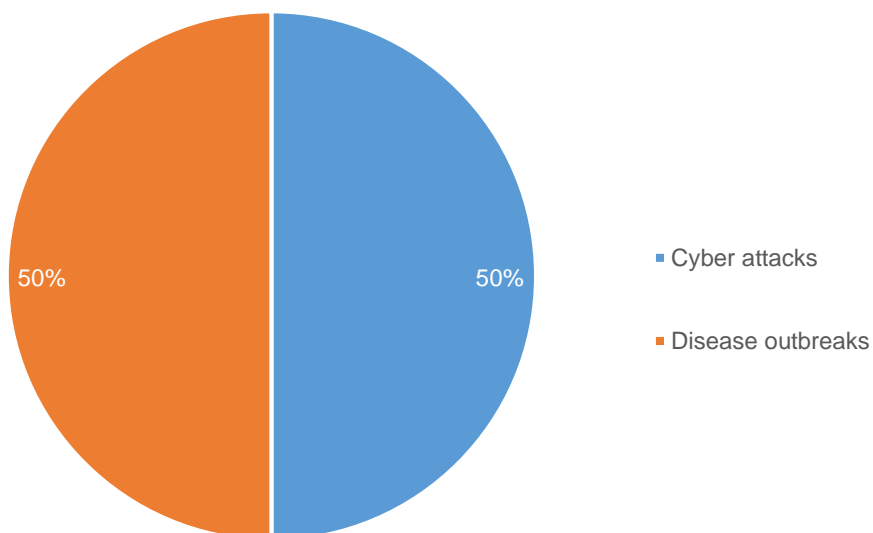


APPENDIX B: PUBLIC SURVEY RESULTS

13. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?

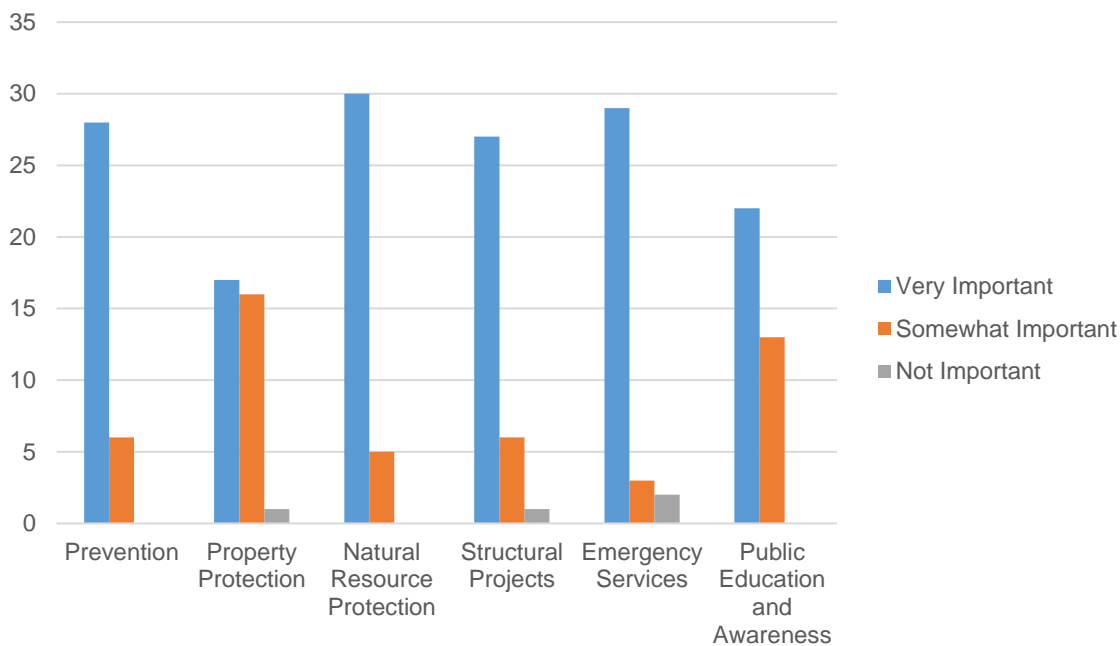


14. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?



APPENDIX B: PUBLIC SURVEY RESULTS

15. A number of community-wide activities can reduce the risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.



Prevention / Local Plans & Regulations - Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.

Property Protection - Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.

Natural Resource Protection - Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.

Structural Projects - Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, seawalls detention / retention basins, channel modification, retaining walls, and storm sewers.

Emergency Services - Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical facilities or systems.

Public Education and Awareness - Actions to inform citizens about hazards and techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials, and demonstration events.

APPENDIX C: CRITICAL FACILITIES

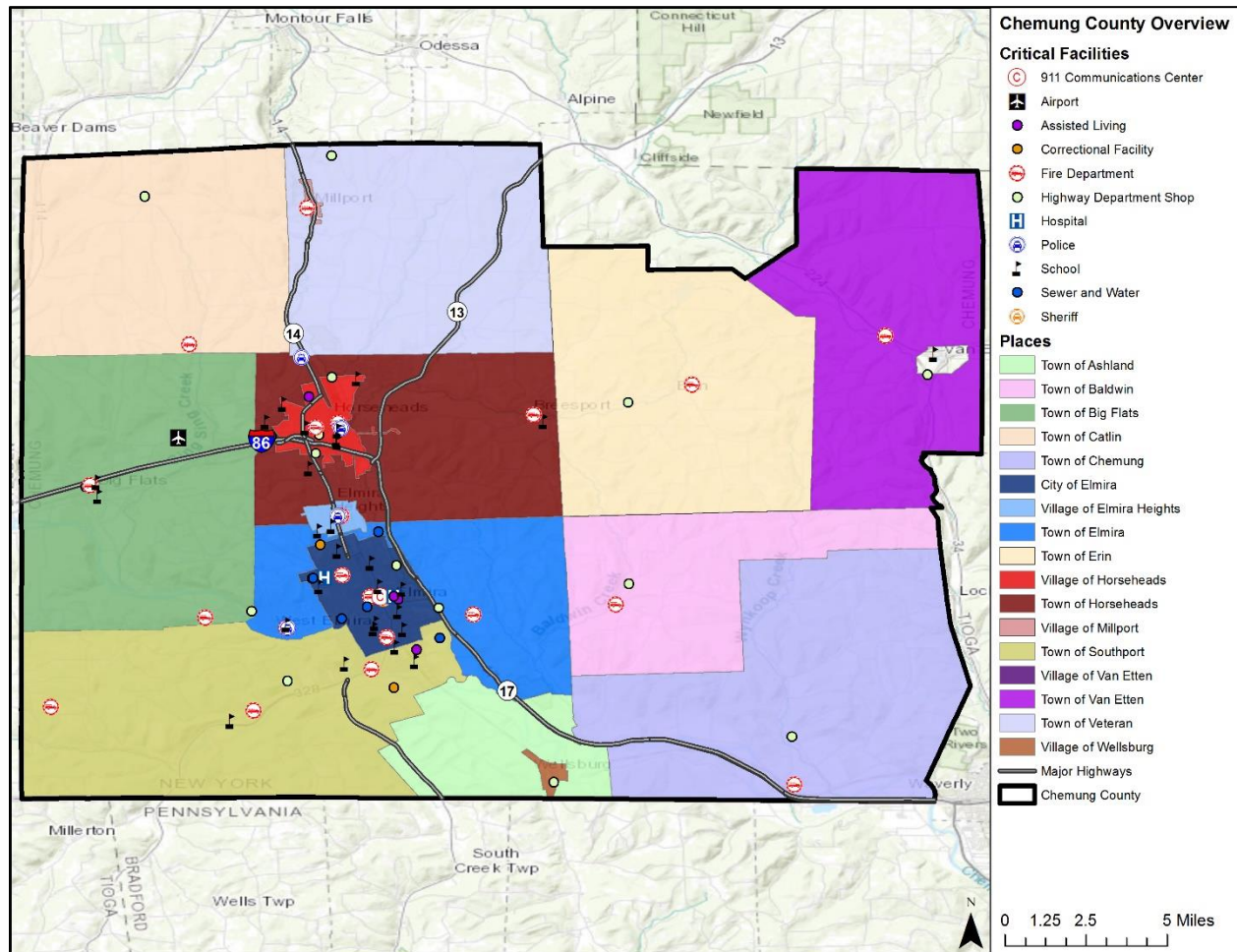
Overview	1
Critical Facilities	1

OVERVIEW

This Appendix is **For Official Use Only (FOUO)** and may be exempt from public release under FOIA. Figures C-1 through C-17 locate all critical facilities that were included in the risk assessment. Mapped facilities were provided by Chemung County Planning Team members. Table C-1 through C-17 note the critical facilities by type.

CRITICAL FACILITIES

Figure C-1. Critical Facilities in Chemung County



APPENDIX C: CRITICAL FACILITIES

Table C-1. Critical Facilities by Type in Chemung County Planning Area

TYPE	NUMBER
911 Communications Center	1
Airport	1
Correctional Facility	3
Fire	21
Highway Department Shop	17
Hospital	2
Nursing Home	5
Police	6
School	30
Water/Wastewater Facility	6

APPENDIX C: CRITICAL FACILITIES

Figure C-2. Critical Facilities in the Town of Ashland

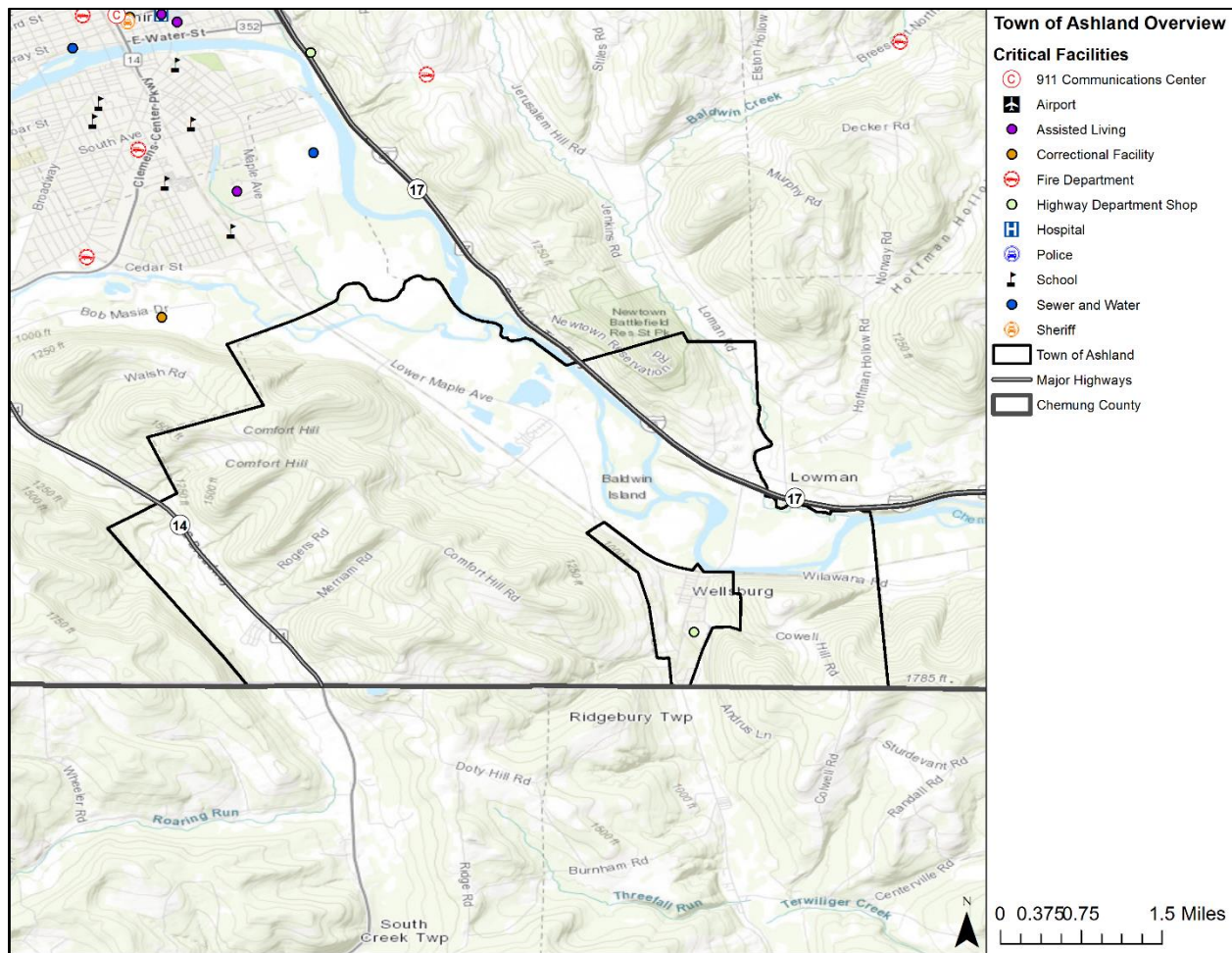


Table C-2. Critical Facilities by Type in the Town of Ashland

TYPE	NUMBER
Highway Department Shop	1

APPENDIX C: CRITICAL FACILITIES

Figure C-3. Critical Facilities in the Town of Baldwin

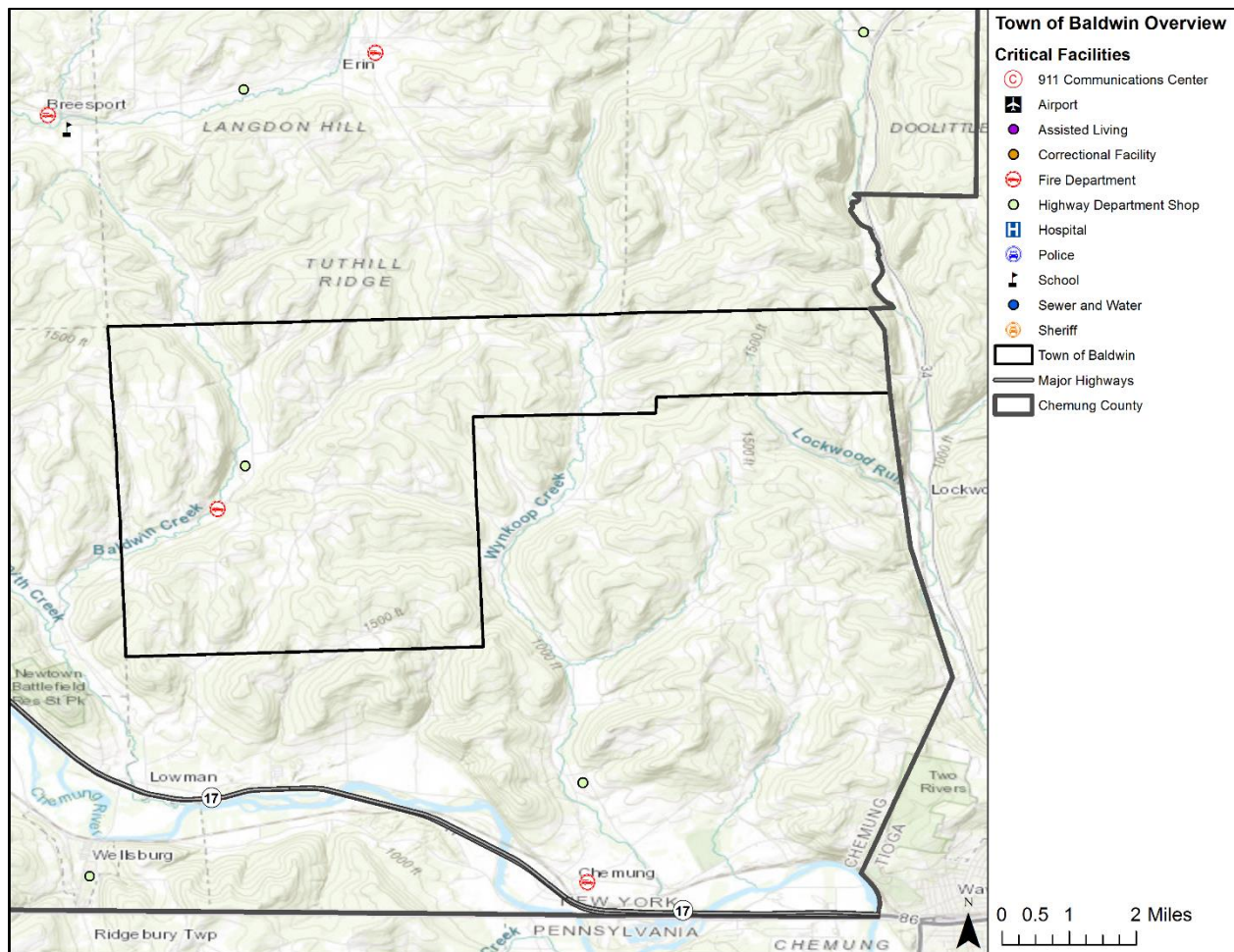


Table C-3. Critical Facilities by Type in the Town of Baldwin

TYPE	NUMBER
Fire	1
Highway Department Shop	1

APPENDIX C: CRITICAL FACILITIES

Figure C-4. Critical Facilities in the Town of Big Flats

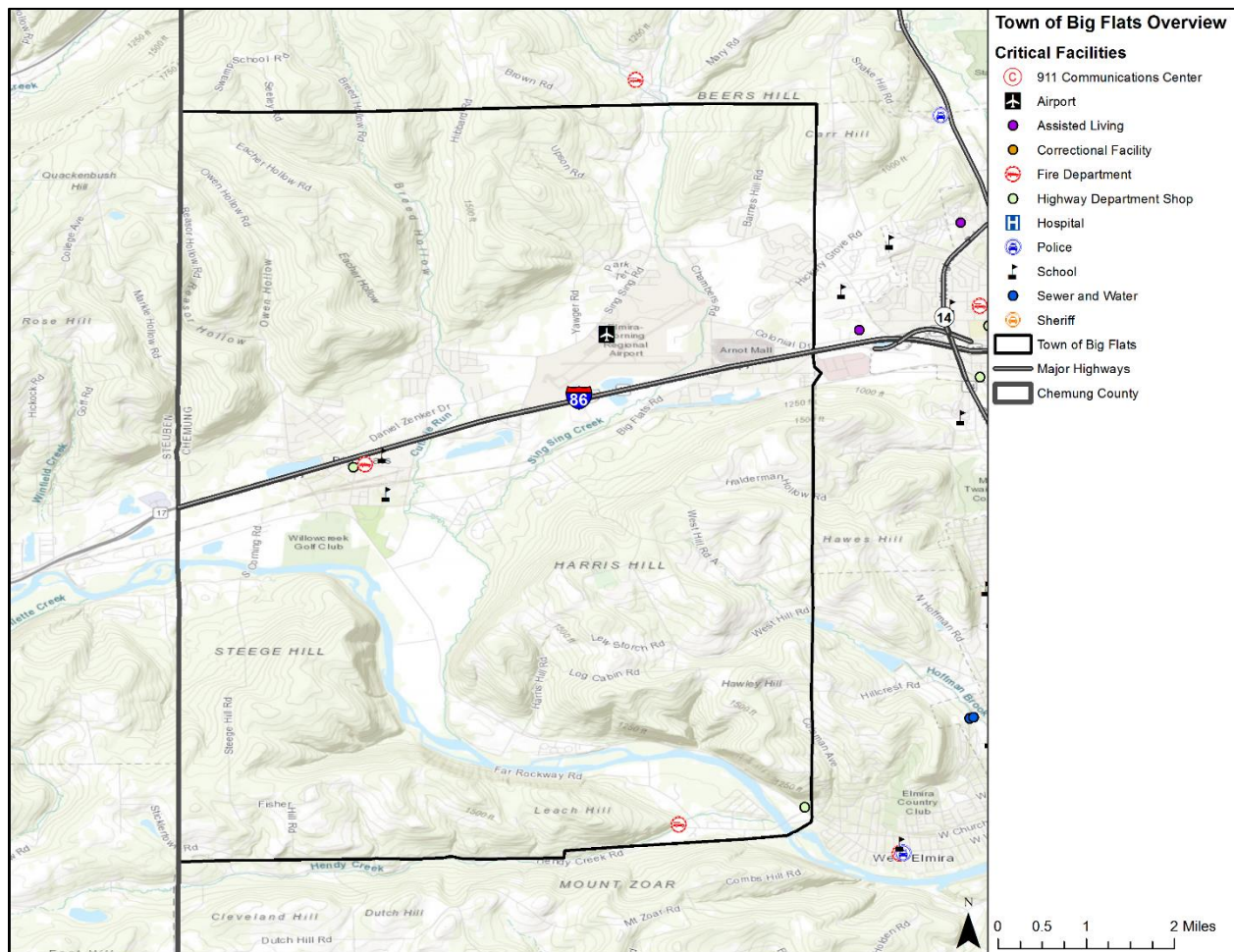


Table C-4. Critical Facilities by Type in the Town of Big Flats

TYPE	NUMBER
Airport	1
Fire	2
Highway Department Shop	1
School	1

APPENDIX C: CRITICAL FACILITIES

Figure C-5. Critical Facilities in the Town of Catlin

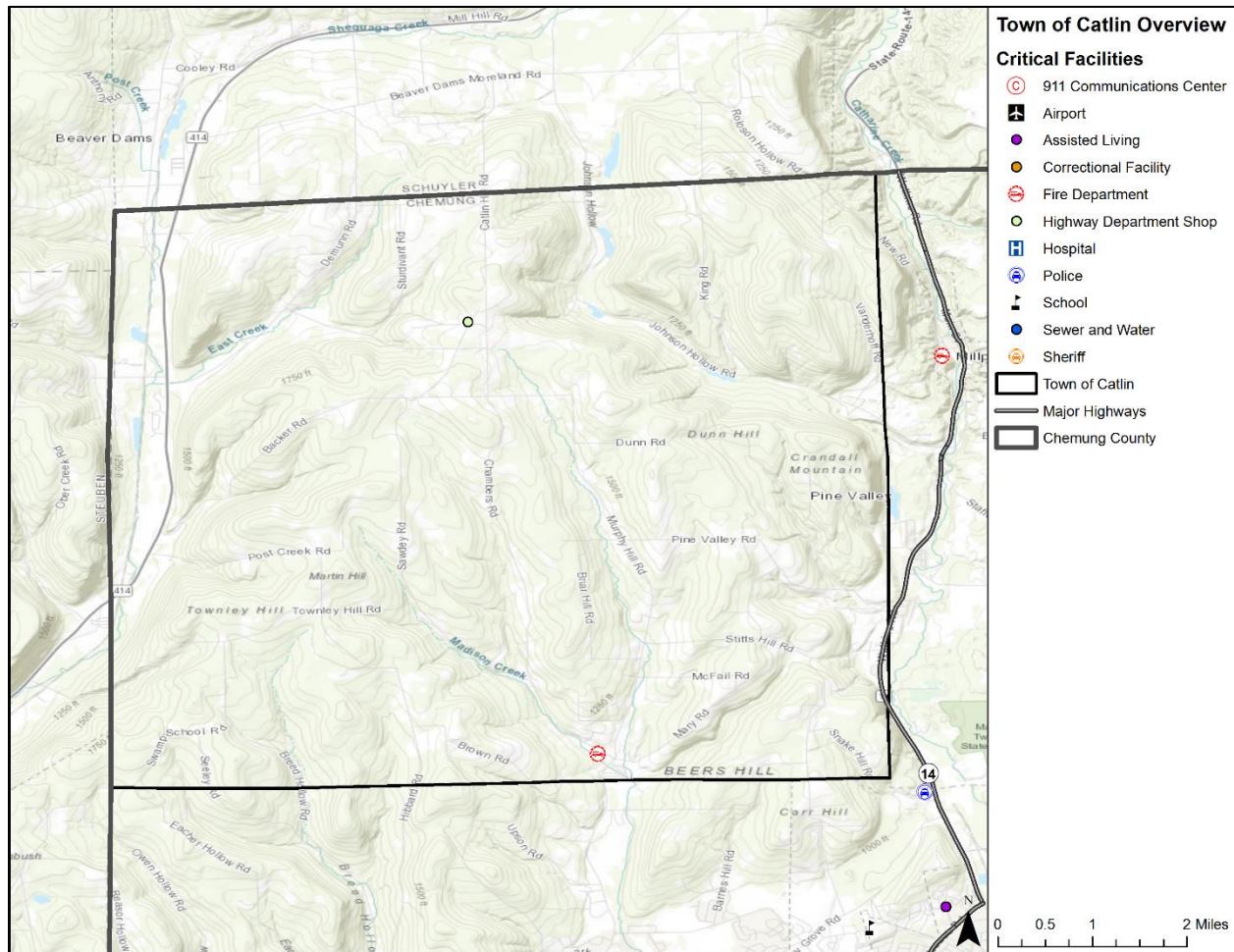


Table C-5. Critical Facilities by Type in the Town of Catlin

TYPE	NUMBER
Fire	1
Highway Department Shop	1

Figure C-6. Critical Facilities in the Town of Chemung

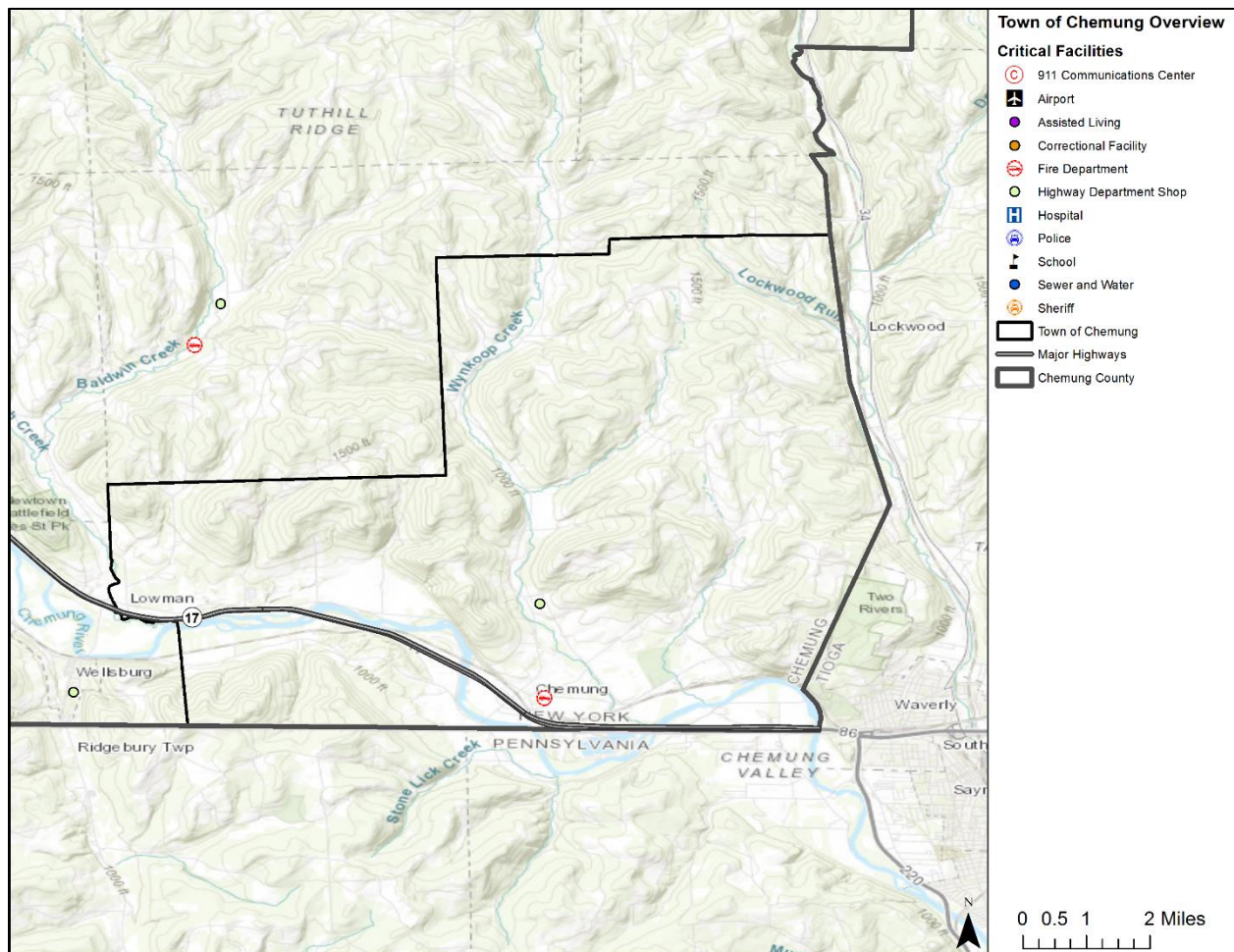


Table C-6. Critical Facilities by Type in the Town of Chemung

TYPE	NUMBER
Fire	1
Highway Department Shop	1

Figure C-7. Critical Facilities in the City of Elmira

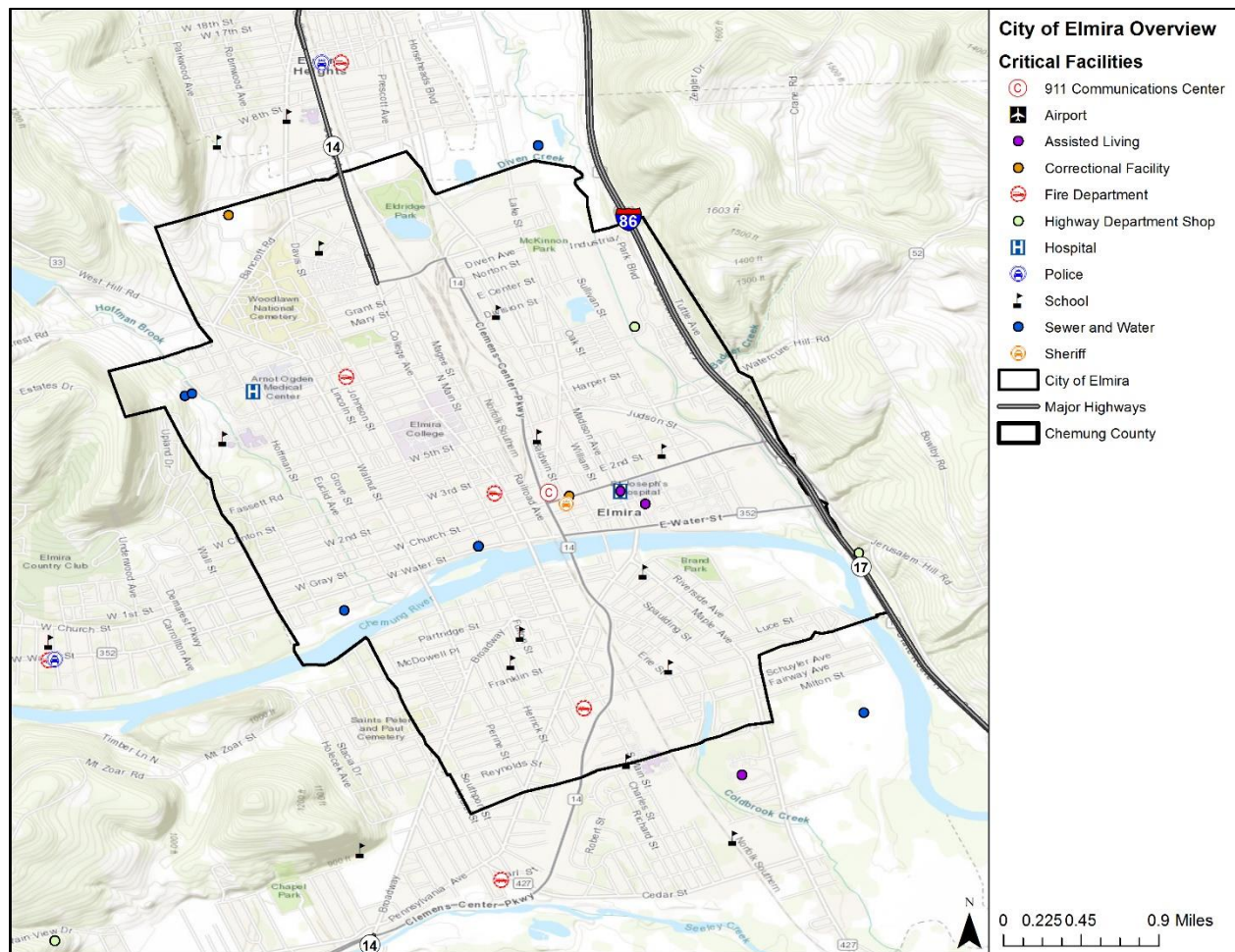


Table C-7. Critical Facilities by Type in the City of Elmira

TYPE	NUMBER
911 Communication Center	1
Correctional Facility	2
Fire	3
Highway Department Shop	3
Hospital	2
Nursing Home	2
Police	2
School	11

APPENDIX C: CRITICAL FACILITIES

TYPE	NUMBER
Water/Wastewater Facility	4

Figure C-8. Critical Facilities in the Town of Elmira

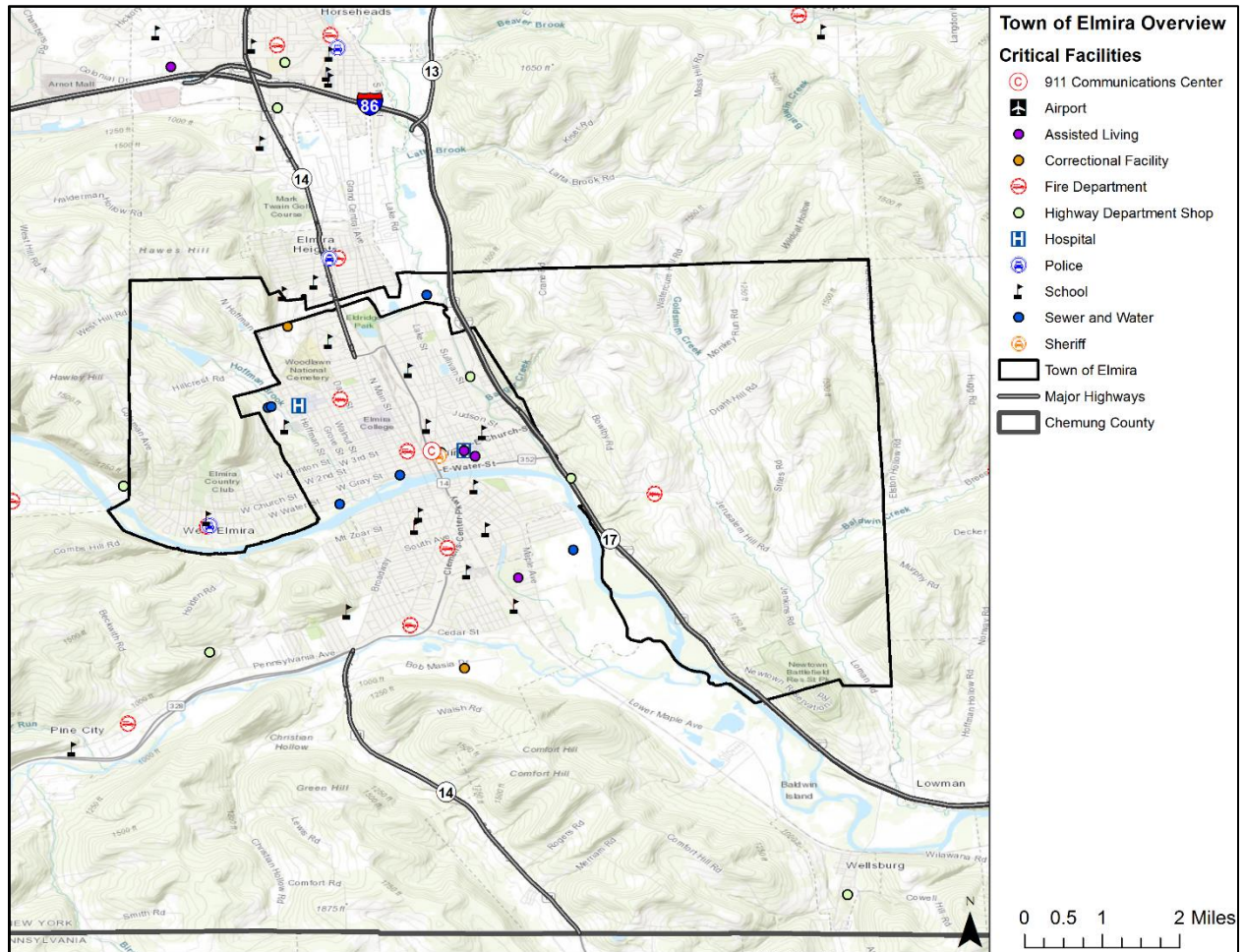


Table C-8. Critical Facilities by Type in the Town of Elmira

TYPE	NUMBER
Fire	2
Highway Department Shop	1
Police	1
School	6
Water/Wastewater Facility	1

APPENDIX C: CRITICAL FACILITIES

Figure C-9. Critical Facilities in the Village of Elmira Heights

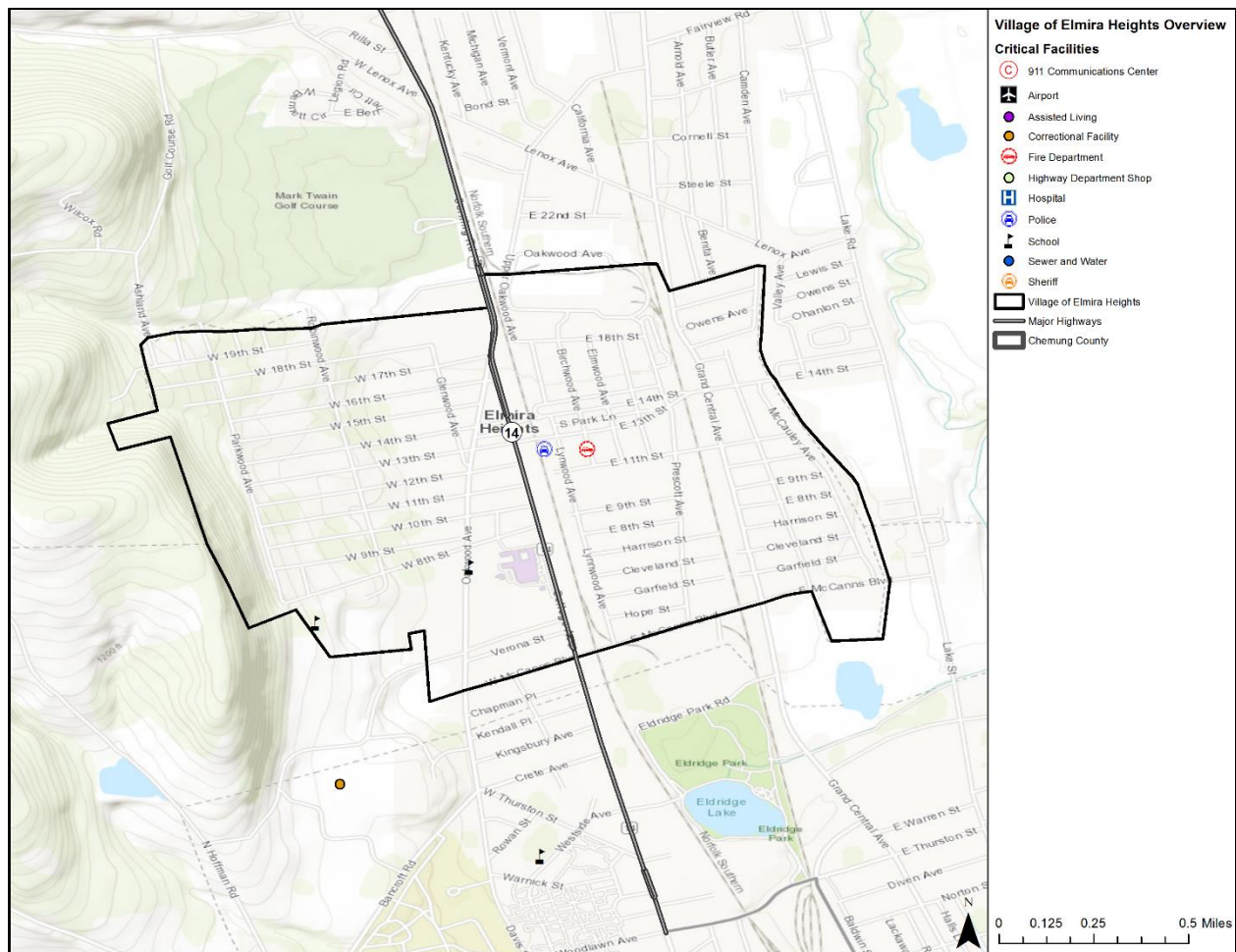


Table C-9. Critical Facilities by Type in the Village of Elmira Heights

TYPE	NUMBER
Fire	1
Highway Department Shop	1
Police	1
School	3

APPENDIX C: CRITICAL FACILITIES

Figure C-10. Critical Facilities in the Town of Erin

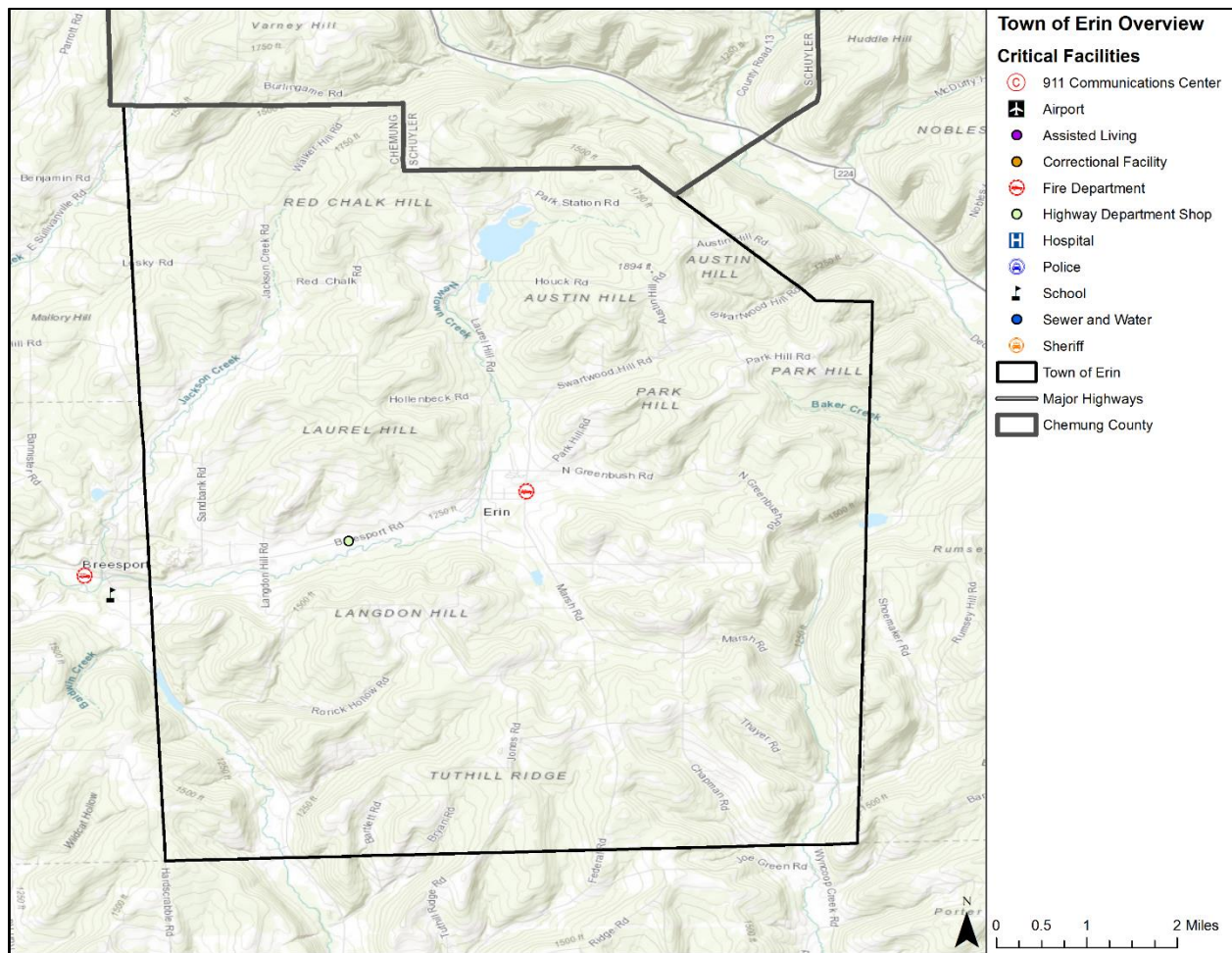


Table C-10. Critical Facilities by Type in the Town of Erin

TYPE	NUMBER
Fire	1
Highway Department Shop	1

APPENDIX C: CRITICAL FACILITIES

Figure C-11. Critical Facilities in the Town of Horseheads

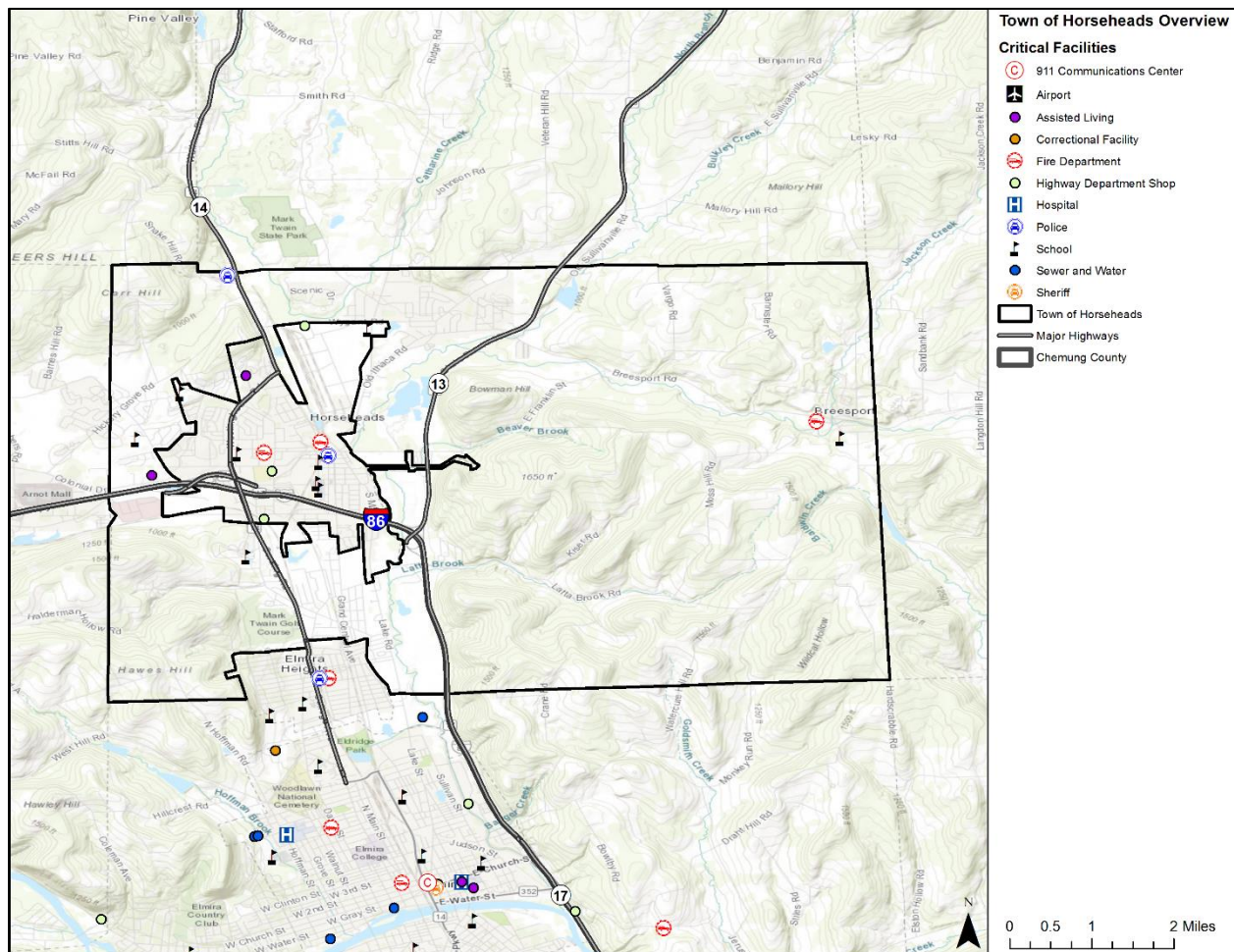


Table C-11. Critical Facilities by Type in the Town of Horseheads

TYPE	NUMBER
Fire	1
Highway Department Shop	1
Nursing Home	1
Police	1
School	4

APPENDIX C: CRITICAL FACILITIES

Figure C-12. Critical Facilities in the Village of Horseheads

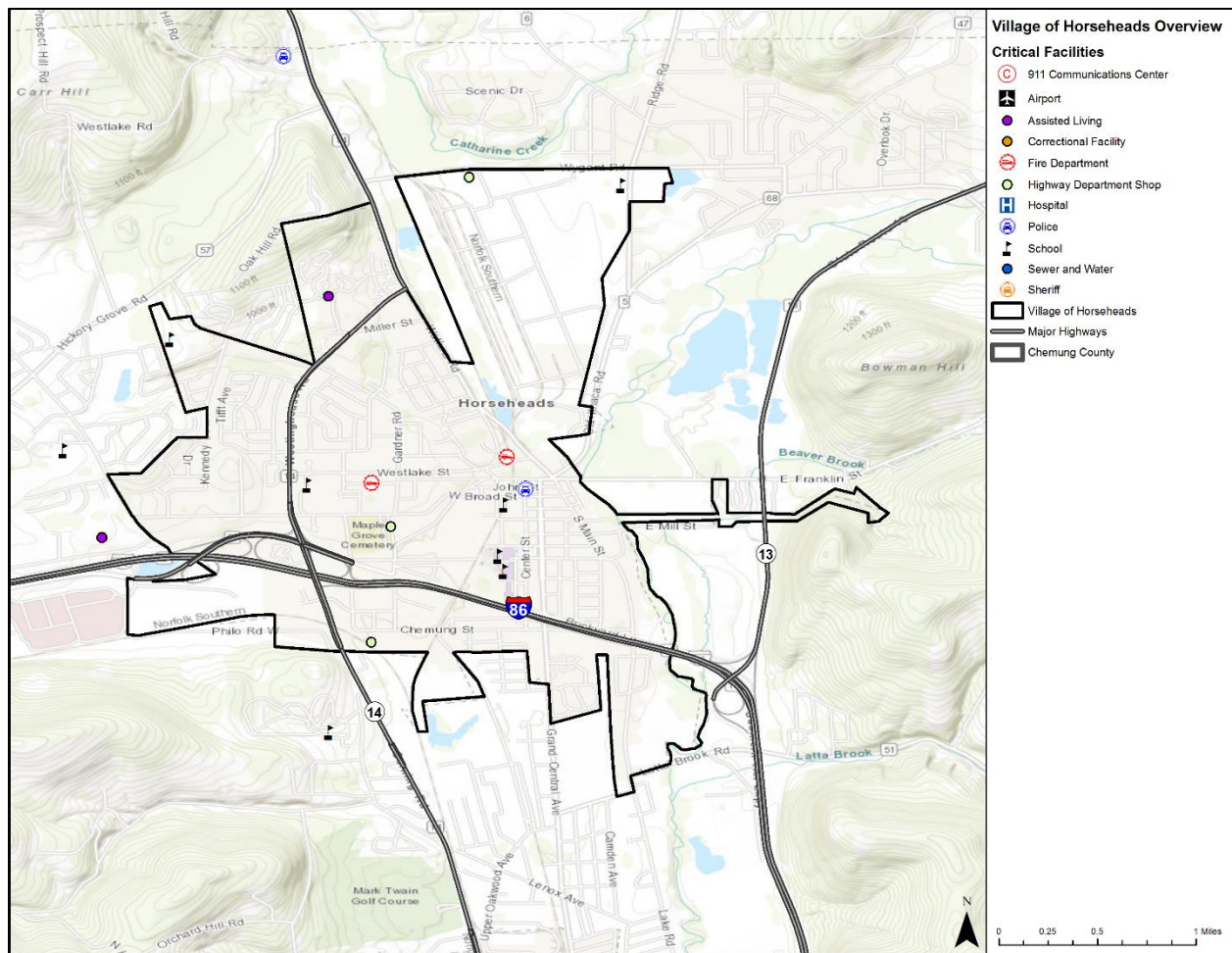


Table C-12. Critical Facilities by Type in the Village of Horseheads

TYPE	NUMBER
Fire	2
Highway Department Shop	1
Nursing Home	1
Police	1
School	4

Figure C-13. Critical Facilities in the Village of Millport

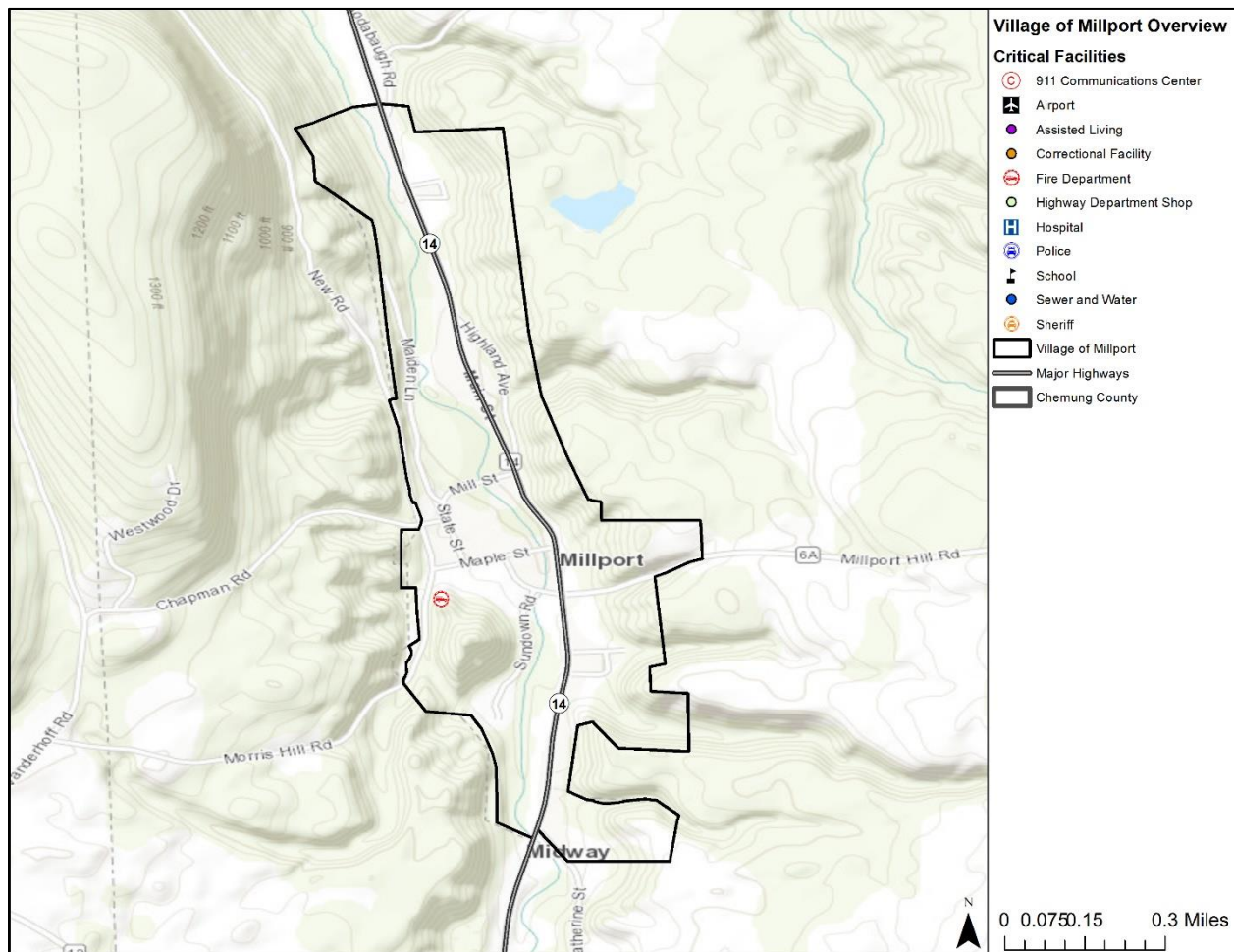


Table C-13. Critical Facilities by Type in the Village of Millport

TYPE	NUMBER
Fire	1

Figure C-14. Critical Facilities in the Town of Southport

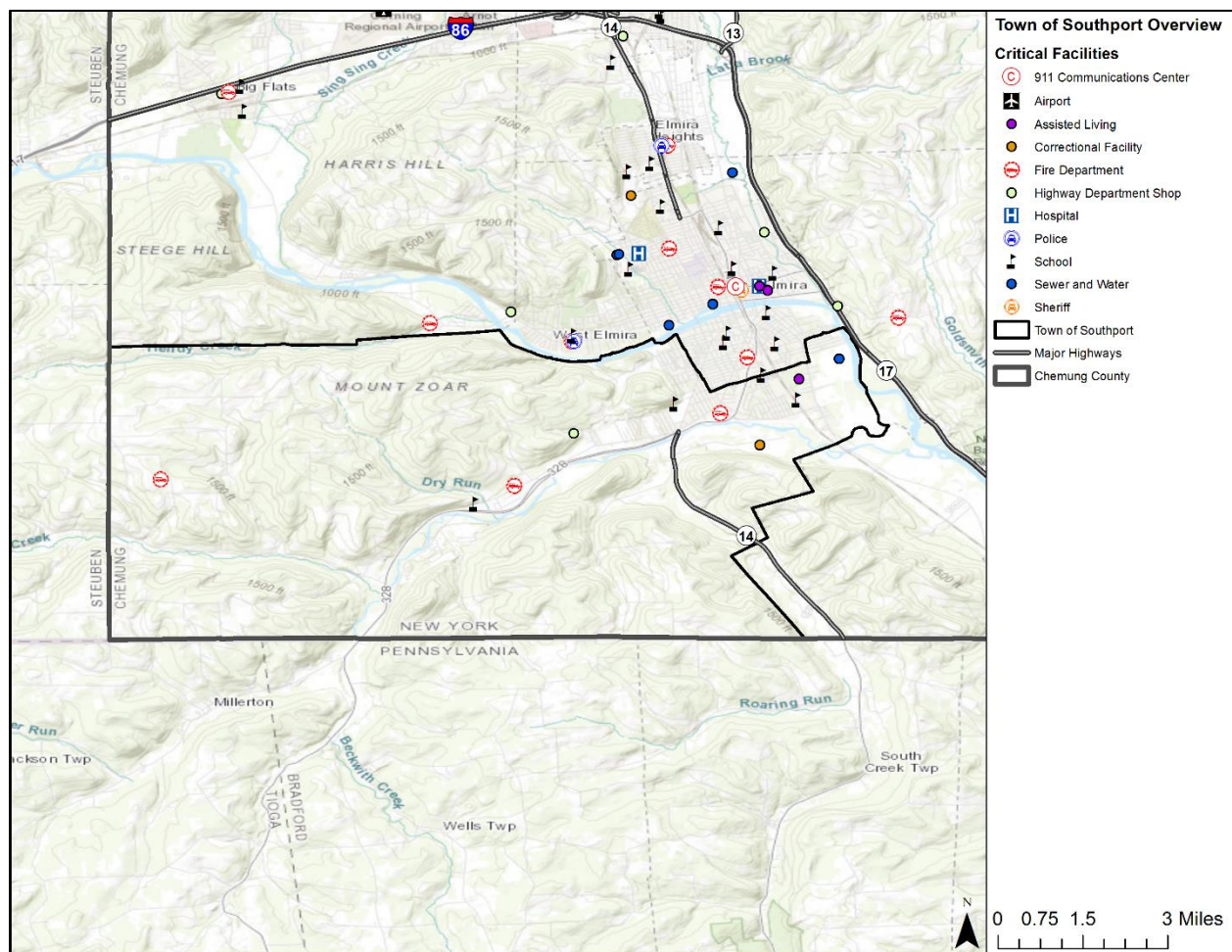


Table C-14. Critical Facilities by Type in the Town of Southport

TYPE	NUMBER
Correctional Facility	1
Fire	3
Highway Department Shop	1
Nursing Home	1
Water/Wastewater Facility	1

APPENDIX C: CRITICAL FACILITIES

Figure C-15. Critical Facilities in the Town of Van Etten

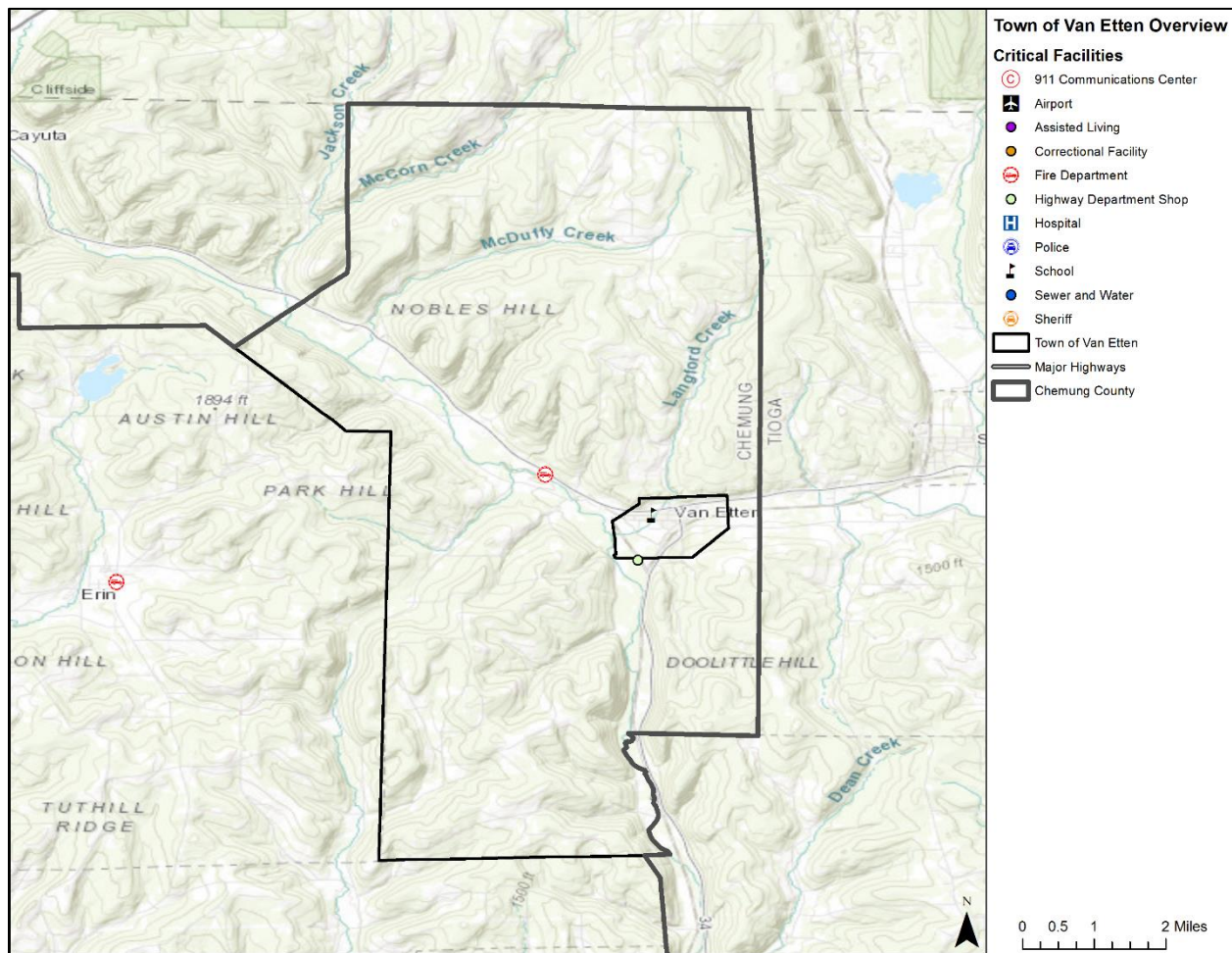


Table C-15. Critical Facilities by Type in the Town of Van Etten

TYPE	NUMBER
Fire	1
Highway Department Shop	1
School	1

APPENDIX C: CRITICAL FACILITIES

Figure C-16. Critical Facilities in the Town of Veteran

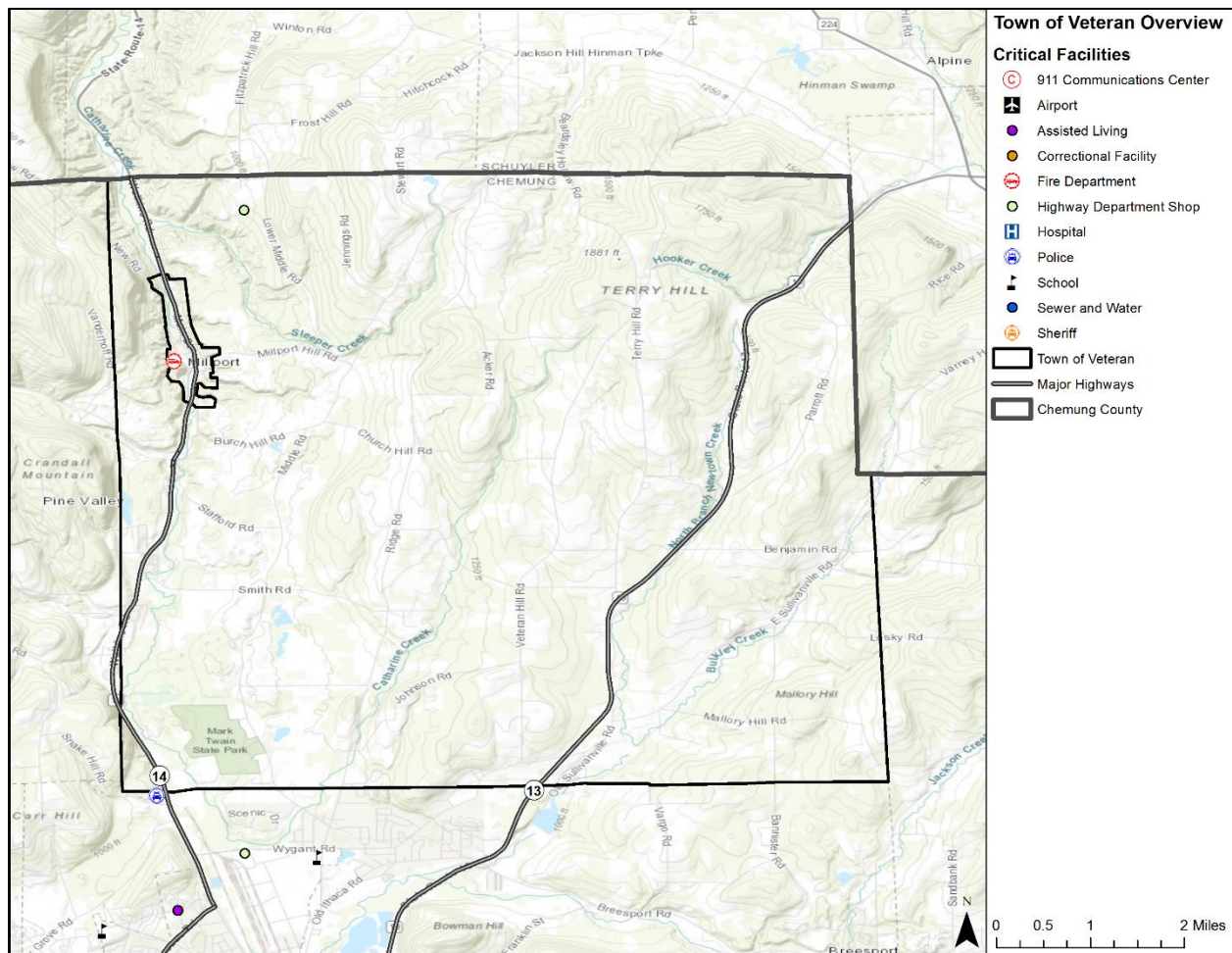


Table C-16. Critical Facilities by Type the Town of Veteran

TYPE	NUMBER
Fire	1
Highway Department Shop	1

Figure C-17. Critical Facilities in the Village of Wellsburg

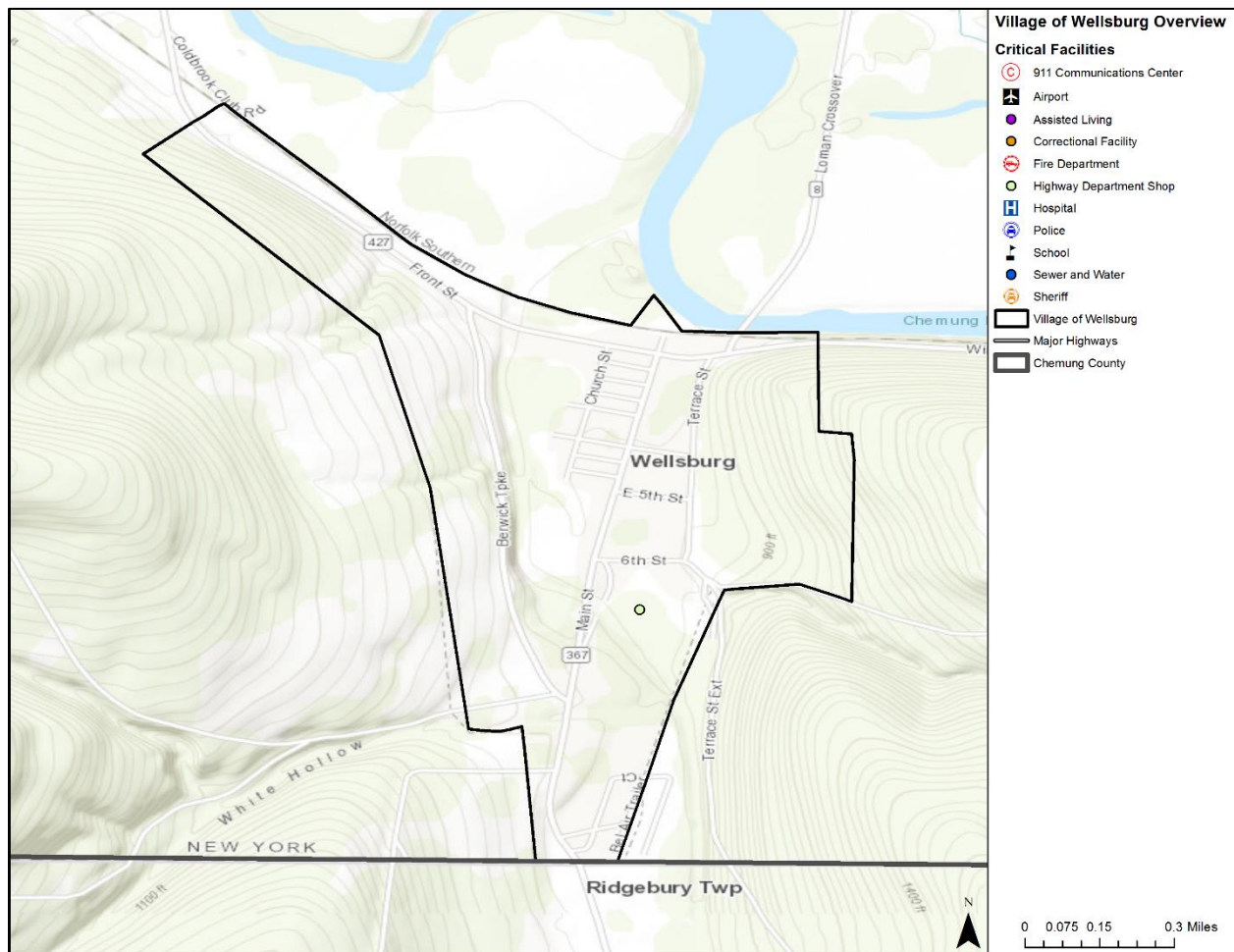


Table C-17. Critical Facilities by Type in the Village of Wellsburg

TYPE	NUMBER
Highway Department Shop	1

APPENDIX D: MEETING DOCUMENTATION

Workshop Documentation	1
Public Meeting Documentation	4
Public Notices	6

WORKSHOP DOCUMENTATION

Appendix E is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).

Chemung County held a series of Planning Team workshops: a Kickoff Workshop on April 12, 2018, a Risk Assessment on July 25, 2018 and Mitigation Strategy Workshop on October 4, 2018. At each of these workshops members of the Planning Team were informed of the planning process, expressed opinions, and volunteered information. Chemung County hosted two public meetings following each workshop. The sign-in sheets for each workshop and public meeting notices are included below. For more details on the workshops and planning process, see Section 2.

Figure D-1. Chemung County Kickoff Workshop, 04.12.18



Chemung County Kickoff Public Meeting
Big Flats Community Center
476 Maple St. Big Flats, NY 14814
April 12, 2018

Please print clearly.

Name	Title	Department	Phone	Email
Rachel Andrews	Mitigation Specialist	H2O Partners	512-983-0092	rachelah2opartnersusa.com
Cynthia Derry	Mitigation Specialist	H2O Partners	607-738-4061	cderry@h2opartnersusa.com
KRISTIN CARB	DEP DIR	CC FIRE & EMO	607-737-2095	Kcarb@co.chemung.ny.us
Mark Ciora	Director	CC FIRE/EMO	(607) 737-2096	MCiora@co.chemung.ny.us
Bonnie Landis Corning			607-368-7730	
Amanda Vannoy-Cone	Big Flats	Resident	570-629-0925	amanda.vannoy@gmail.com
Adam Hungerford	DIRECTOR	ABLE2	607-739-3591	hungerford@able-2.org

1



Chemung County Kickoff Workshop
Big Flats Community Center
476 Maple St. Big Flats, NY 14814
April 12, 2018 noon

Please print clearly.

Name	Title	Department	Phone	Email
KRISTIN CARB	DEP DIR	CC FIRE & EMO	607-737-2095	Kcarb@co.chemung.ny.us
Rachel Andrews	Mitigation Specialist	H2O Partners	512-983-0092	rachelah2opartnersusa.com
Cynthia Derry	Mitigation Specialist	H2O Partners	607-738-4061	cderry@h2opartnersusa.com
Michael W. Edmund	Supervisor	Town of HMTT	607-737-8787	Supervisor@townofhmtt.org
David J. Fricke	Supervisor	Town of HMDG	607-739-8788	dfricke@townofhmdg.org
Nancy Vonderhoff	Supervisor	Town of HMDG	(607) 737-2410	nvonderhoff@townofhmdg.org
Jim R. R. R. R.	Supervisor	Town of HMDG	(607) 737-2410	SR@townofhmdg.org
Matthew R. R. R.	Supervisor	Town of HMDG	607-737-2410	Matthew@townofhmdg.org
David Sullivan	Supervisor	Town of HMDG	607-734-3031	dsullivan@townofhmdg.org
Tom Whipple	Code Enforcement	Town of Big Flats	607-562-2443	twipple@bigflatsny.gov
Ed Finkbeiner	Supervisor	Town of Big Flats	607-562-2443	efinkbeiner@bigflatsny.gov
Chris Deane	Supervisor	Town of Chemung	607-529-3241	Highway@townofchemung.org
Carl Blakes	Supervisor	Town of Chemung	607-737-1261	Carl@townofchemung.org

1

Figure D-2. Chemung County Risk Assessment 07.25.18



Chemung County Risk Assessment Workshop
Big Flats Community Center
476 Maple St. Big Flats, NY 14814
July 25, 2018 noon

Please print clearly.

Name	Title	Department	Phone	Email
Rachel Andrews	Mitigation Specialist	H2OPartners	512-983-0092	rachelah2opartnersusa.com
Cynthia Derry	Mitigation Specialist	H2OPartners	607-738-1061	cderry@h2opartnersusa.com
Kristin A. CARD	DEPUTY DIR. CHEMUNG CO. EMD		607-757-2095	kcard@chemungcounty.ny.gov
LAYANNE Phelps	Town Supervisor	T/COALTON	607-734-1017	codlinawork@icloud.com
Tom SILVER	Director of Code	T/THOS CITY/ELMIRA	607-734-7605	tsilver@townofelmira.org
Jeffrey Sweet	Code Officer	Village of Elmira Heights	607-734-7192	code@elmiraheights.org
STEVE T/BO	Mayor	ELMIRA	607-734-7888	stewart@elmira.org
T J SWARTZ	ELMIRA		607-734-6414	TCJCODE@ELMIRA.org
Kathleen Scerston	Deputy Supervisor	Southport	607-732-8300	kscerston@townofsouthport.org
Don GROSS	Village President		607-5266	gross@postsignal.com
Jason French	Supervisor	City of Elmira	712-1746	Jeffrey@cityofelmira.org
Vera Robinson	Supervisor	Ashland	7320723	topland@STONYR.R.CO
Ed Fairbairn	Supervisor	Big Flats	5628443	efairbairn@bigflats.org

1

Figure D-3. Chemung County Mitigation Strategy Workshop, 10.04.18



Chemung County Mitigation Strategy Workshop
Hazard Mitigation Plan Update
Big Flats Community Center
476 Maple St. Big Flats, NY 14814
October 4, 2018 2:00 PM

Please print clearly.

Name	Title	Department	Phone	Email
Paul Fairbairn	Mayor	Big Flats	607-562-8443	
Lisa Griggs	Mayor	WADSWORTH	607-524-0549	
STEVEN T/BO	Mayor	ELMIRA	607-734-7888	
Mark Vanderhoff	Supervisor	WADSWORTH	(607) 729-2410	markvanderhoff@wads.org
JOHN LEWIS	Mayor	TOWN OF ELMIRA	607-734-7605	
Jason French	City Sup	City of Elmira	607-712-1746	Jeffrey@cityofelmira.org
Chris Anderson	Deputy Supervisor	Big Flats	607-562-8443	chrisanderson@bigflats.org
Ed Fairbairn	Town Supervisor	Big Flats	607-562-8443	efairbairn@bigflats.org

PUBLIC MEETING DOCUMENTATION

As discussed in Section 2, public meetings were held in conjunction with each of the Chemung County workshops. Survey respondents were asked if they wanted to be informed about public meetings, and these respondents were invited to the public meetings. Documentation in the form of sign-in sheets for each of the meetings follows.

Figure D-4. Chemung County Public Kickoff Workshop Public Meeting, 04.12.18



Chemung County Kickoff Public Meeting
Big Flats Community Center
476 Maple St. Big Flats, NY 14814
April 12, 2018

Please print clearly.

Name	Title	Department	Phone	Email
Rachel Andrews	Mitigation Specialist	H2O Partners	512-983-0092	rachel@h2opartnersusa.com
Cynthia Derry	Mitigation Specialist	H2O Partners	607-738-4061	cderry@h2opartnersusa.com
KRISTIN CARD	DEP DIR	CC FIRE/EMO	607-737-2095	kcard@co.chemung.ny.us
Mark Ciara	Director	CC FIRE/EMO	607-737-2096	mcara@co.chemung.ny.us
Bonnie Landis	Corning		607-368-7730	
Amanda Vannoy-Coak	Big Flats	Resident	570-629-0925	amanda.vannoy@gmail.com
Adam Hungerford	DIRECTOR	ABLE2	607-739-3591	hungerford@able-2.org

Figure D-5. Chemung County Risk Assessment Public Meeting, 07.25.18



Chemung County Risk Assessment Public Meeting
Big Flats Community Center
476 Maple St. Big Flats, NY 14814
July 25, 2018 - 5 p.m.

Please print clearly.

Name	Title	Department	Phone	Email
Rachel Andrews	Mitigation Specialist	H2O Partners	512-983-0092	rachel@h2opartnersusa.com
Cynthia Derry	Mitigation Specialist	H2O Partners	607-738-4061	cderry@h2opartnersusa.com
Black Clara	Director	Fire/EMO	607-737-2096	
Kristin A. Cord	Assistant	Kreigh	607-737-2095	

Figure D-6. Chemung County Mitigation Strategy Workshop Public Meeting, 10.04.18



Chemung County Mitigation Strategy Public Meeting
Hazard Mitigation Plan Update
Big Flats Community Center
476 Maple St. Big Flats, NY 14814
October 4, 2018 - 5 p.m.

Please print clearly.

Name	Title	Department	Phone	Email
Rachel Andrews	Mitigation Specialist	H2O Partners	512-983-0092	rachel@h2opartnersusa.com
Kristin Cord	Chemung Co.		607-737-2095	
Cynthia Derry	Mitigation Specialist	H2O Partners	607-738-4061	cderry@h2opartnersusa.com
Mike Edwards	Supervisor	Hoschens	607-739-8789	
Isabel Garcia	Reporter	WENY NEWS	607-739-1412	igarcia@weny.com

PUBLIC NOTICES

Public notices to announce Chemung County's participation in the Plan development process were posted on various websites, outside of community offices, and Facebook (including participating jurisdictions within the County) as shown in Figures D-7 through D-15.

Figure D-7. Elmira Heights Website, 04.12.18 Public Meeting



Figure D-8. Town of Big Flats Website, 04.12.18 Public Meeting



Figure D-9. Chemung County Fire/Emergency Services Facebook Page, 04.12.18 Public Meeting



Figure D-10. Chemung County Environmental Emergency Services Facebook Page, 04.12.18 Public Meeting

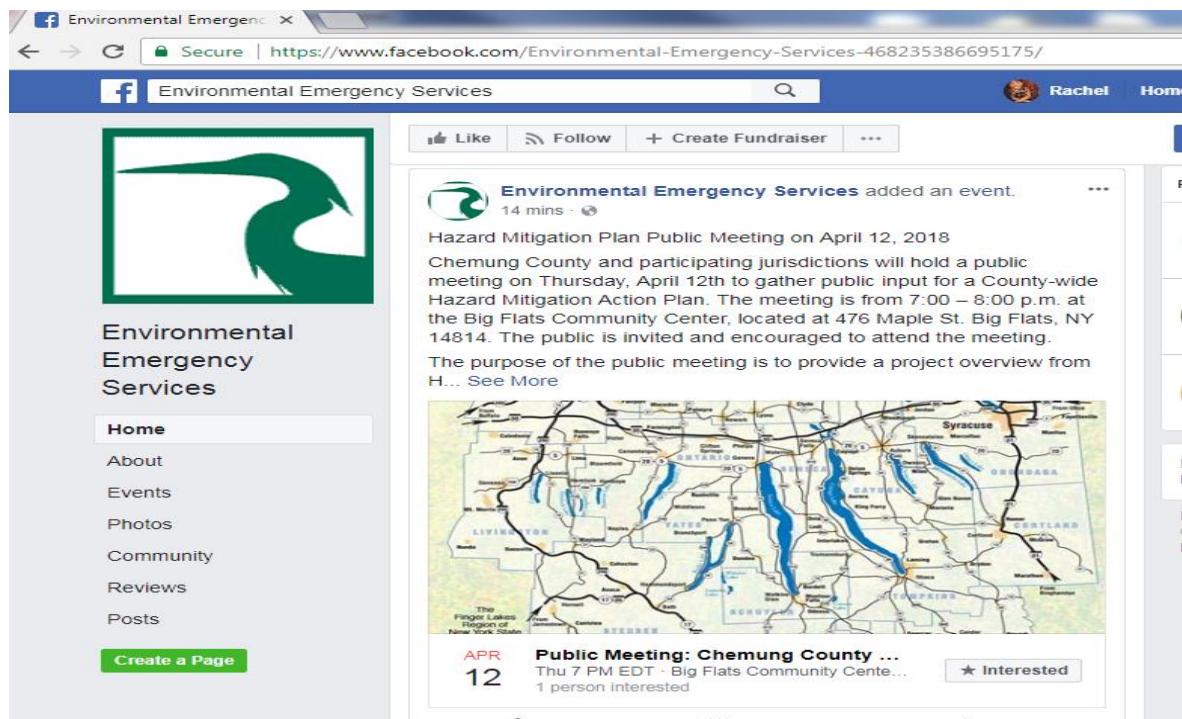


Figure D-11. Town of Elmira Website, 07.25.18 Public Meeting



Figure D-12. Town of Elmira Bulletin Board, 07.25.18 Public Meeting

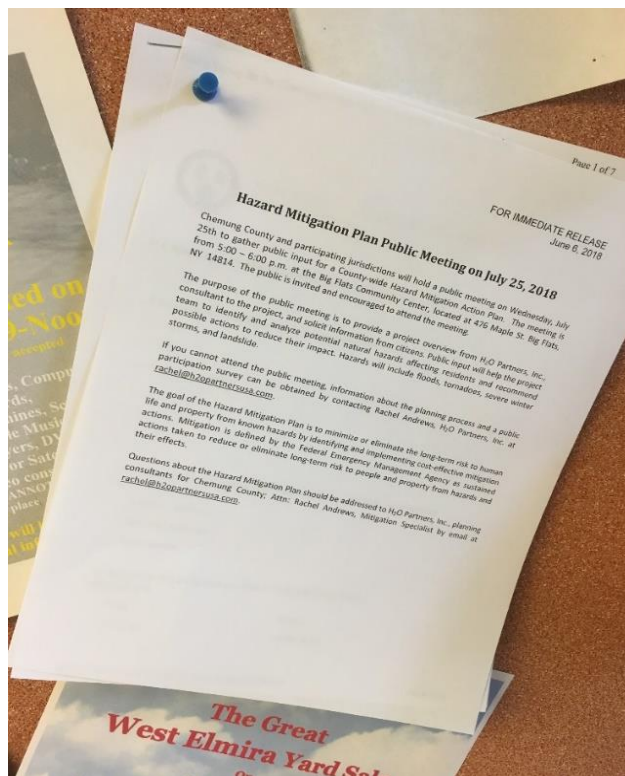


Figure D-13. Chemung County Environmental Emergency Services Facebook Page, 07.25.18 Public Meeting

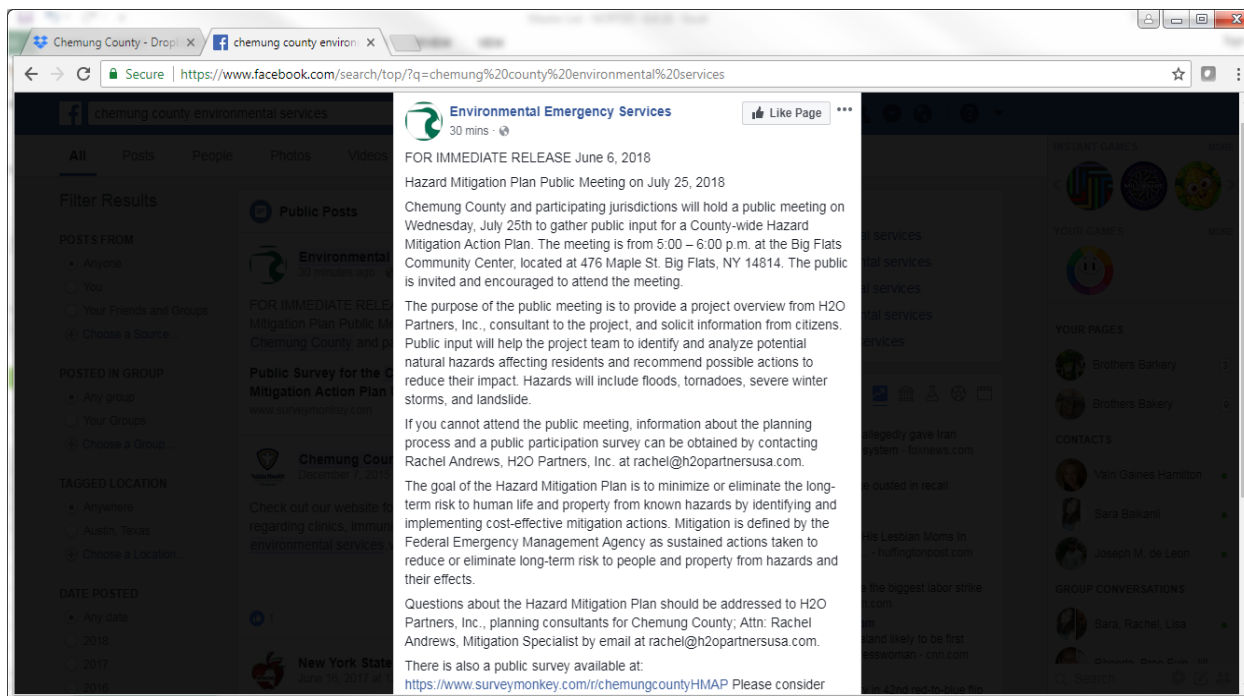


Figure D-14. Chemung County Fire/Emergency Services Facebook Page, 10.04.18 Public Meeting

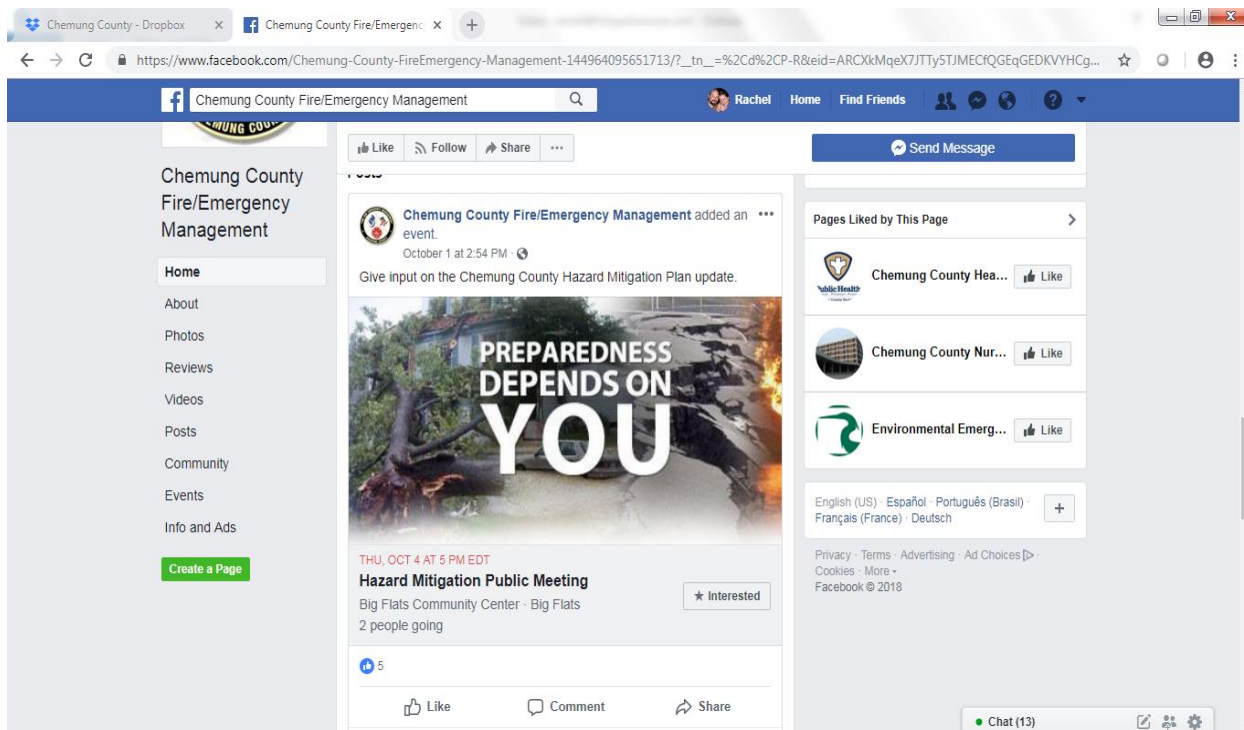


Figure D-15. Chemung County Fire/Emergency Services Website, 10.04.18 Public Meeting



APPENDIX E: CAPABILITY ASSESSMENT

Overview	1
Community Capability Assessments.....	1

OVERVIEW

A Community Capability Assessment is an integral component of the Hazard Mitigation Planning Process. It is an invaluable tool in assessing a community's existing planning and regulatory capabilities to support implementation of mitigation strategy objectives.

Beginning on Page 1, a completed Capability Assessment Checklist provides information on existing policies, plans, and regulations in place for Planning Team members at the local level or that may be provided by the County on an as-needed basis. **Participation is denoted with an “x” on the Checklist.**

COMMUNITY CAPABILITY ASSESSMENTS

COMMUNITY CAPABILITY CHECKLIST	Chemung County	City of Elmira	Town of Ashland	Town of Baldwin	Town of Big Flats	Town of Catlin	Town of Chemung	Town of Elmira	Town of Erin	Town of Horseheads	Town of Southport	Town of Van Etten	Town of Veteran	Village of Elmira Heights	Village of Horseheads	Village of Millport	Village of Wellsburg
Plans																	
Capital Improvements Plan			x		x					x							
Master or Comprehensive Plan					x										x		
Community Wildfire Protection Plan			x														
Continuity of Operations	x		x			x	x	x		x			x	x			
Economic Development Plan			x														
Emergency Operations Plan	x		x	x		x	x	x					x	x	x		

APPENDIX E: CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	Chemung County	City of Elmira	Town of Ashland	Town of Baldwin	Town of Big Flats	Town of Catlin	Town of Chemung	Town of Elmira	Town of Erin	Town of Horseheads	Town of Southport	Town of Van Etten	Town of Veteran	Village of Elmira Heights	Village of Horseheads	Village of Millport	Village of Wellsburg
Evacuation Plan	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Flood Response Plan																	
Floodplain Management Plan																	
Hazard Mitigation Plan	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Historic Preservation Plan			x				x										
Land Use Plan			x		x		x	x		x					x		
Open Space Plan			x		x		x										
Post-disaster Recovery Plan																	
Redevelopment Plan					x		x										
Stormwater Management Plan	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Transportation Plan			x				x										
Watershed Protection Plan			x	x			x										
Policies / Ordinances																	
Building Codes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Floodplain Ordinance		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Property Set-Back Ordinance			x	x	x		x	x		x				x	x		
Real Estate Disclosure Requirements			x				x										
Site Plan Review Requirements			x		x	x	x	x		x				x	x		

APPENDIX E: CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	Chemung County	City of Elmira	Town of Ashland	Town of Baldwin	Town of Big Flats	Town of Catlin	Town of Chemung	Town of Elmira	Town of Erin	Town of Horseheads	Town of Southport	Town of Van Etten	Town of Veteran	Village of Elmira Heights	Village of Horseheads	Village of Millport	Village of Wellsburg
Stormwater Ordinance			x	x	x	x	x	x		x				x	x		
Subdivision Regulations			x		x	x	x	x		x				x	x		
Watershed Ordinance																	
Zoning Ordinance/Land Use Restrictions			x	x	x	x	x			x				x	x		
Programs																	
Fire Code	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Floodplain Maps/Flood Insurance Studies	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Hydrologic/Hydraulic Studies			x				x	x						x	x		
Mutual Aid Agreement	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
National Flood Insurance Program Participant		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
NFIP Community Rating System Participant					x					x					x		
Property Acquisition Program					x		x										
Public Education/Awareness Programs	x		x		x	x	x	x		x			x		x		
Stream Maintenance Program			x	x			x	x		x			x	x	x		
Storm Drainage Systems Maintenance Program			x				x	x		x			x		x		

APPENDIX E: CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	Chemung County	City of Elmira	Town of Ashland	Town of Baldwin	Town of Big Flats	Town of Catlin	Town of Chemung	Town of Elmira	Town of Erin	Town of Horseheads	Town of Southport	Town of Van Etten	Town of Veteran	Village of Elmira Heights	Village of Horseheads	Village of Millport	Village of Wellsburg
Storm Ready Community	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Staff / Departments																	
Building Code Official	x	x	x	x	x	x	x	x		x			x	x	x	x	
Emergency Manager	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Engineer/Public Works Official	x	x				x	x	x					x	x		x	
Environmental Conservation Specialist	x					x	x						x	x		x	
Floodplain Administrator	na	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
GIS Specialist	x		x		x	x	x			x			x	x	x	x	
Personnel with Hazard Knowledge	x	x	x		x	x	x	x		x			x	x	x	x	
Planner	x				x	x	x			x			x	x	x	x	
Public Information Official	x		x		x	x	x			x			x	x	x	x	
Resource Development/Grant Writer				x	x					x							

APPENDIX F: TEMPORARY HOUSING PLANS

Overview	1
Temporary Housing Plans.....	1

OVERVIEW

Each participating jurisdiction must identify sites for the placement of temporary housing units to house residents displaced by disaster. Figures F-1 through F-17 provide temporary housing plans by jurisdiction.

TEMPORARY HOUSING PLANS

Figure F-1. Temporary Housing Plan Chemung County

Chemung County- Temporary Housing for Disaster Recovery

As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), the State Standard below indicates that we must prepare for the possible need to house disaster victims:

Plan for Displaced Residents
Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

In the event that Chemung County experiences an emergency that causes residents to relocate for an extended period of time, the County would first identify any housing stock and lots currently available for sale or lease. If more space is still needed, the County has identified two sites that could potentially be used for temporary housing units, the Chemung County Fairgrounds and Harris Hill Park. These sites are not located in a special flood hazard area, and already have some amenities such as:

- bathhouses with toilet and shower facilities
- electric, water and sewer hook ups for recreational vehicle sites
- potable water
- kitchen/feeding facilities
- several acres of open space

Chemung County would be willing to share access to either of these sites for any municipality that could not identify usable land for this purpose in the event of an emergency within their jurisdiction.

Additionally, the County agrees that the Town of Chemung can use the Fairgrounds.



APPENDIX F: TEMPORARY HOUSING PLANS



Figure F-2. Temporary Housing Plan Town of Ashland

Town of Ashland (Chemung County)- Temporary Housing for Disaster Recovery

As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), the State Standard below indicates that we must prepare for the possible need to house disaster victims:

Plan for Displaced Residents

Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

In the event that Ashland experiences an emergency that causes residents to relocate for an extended period of time, the County has identified two sites that could potentially be used for temporary housing units, the Chemung County Fairgrounds and Harris Hill Park. These sites are not located in a special flood hazard area, and already have some amenities such as:

- bathhouses with toilet and shower facilities
- electric, water and sewer hook ups for recreational vehicle sites
- potable water
- kitchen/feeding facilities
- several acres of open space

Chemung County has noted that they are going to share access to either of these sites for any municipality that could not identify usable land for this purpose in the event of an emergency within that respective jurisdiction.



APPENDIX F: TEMPORARY HOUSING PLANS



Figure F-3. Temporary Housing Plan Town of Baldwin

Town of Baldwin (Chemung County)- Temporary Housing for Disaster Recovery

As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), the State Standard below indicates that we must prepare for the possible need to house disaster victims:

Plan for Displaced Residents

Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

In the event that Baldwin experiences an emergency that causes residents to relocate for an extended period of time, the County has identified two sites that could potentially be used for temporary housing units, the Chemung County Fairgrounds and Harris Hill Park. These sites are not located in a special flood hazard area, and already have some amenities such as:

- bathhouses with toilet and shower facilities
- electric, water and sewer hook ups for recreational vehicle sites
- potable water
- kitchen/feeding facilities
- several acres of open space

Chemung County has noted that they are going to share access to either of these sites for any municipality that could not identify usable land for this purpose in the event of an emergency within that respective jurisdiction.



APPENDIX F: TEMPORARY HOUSING PLANS



Figure F-4. Temporary Housing Plan Town of Big Flats

November 20, 2018

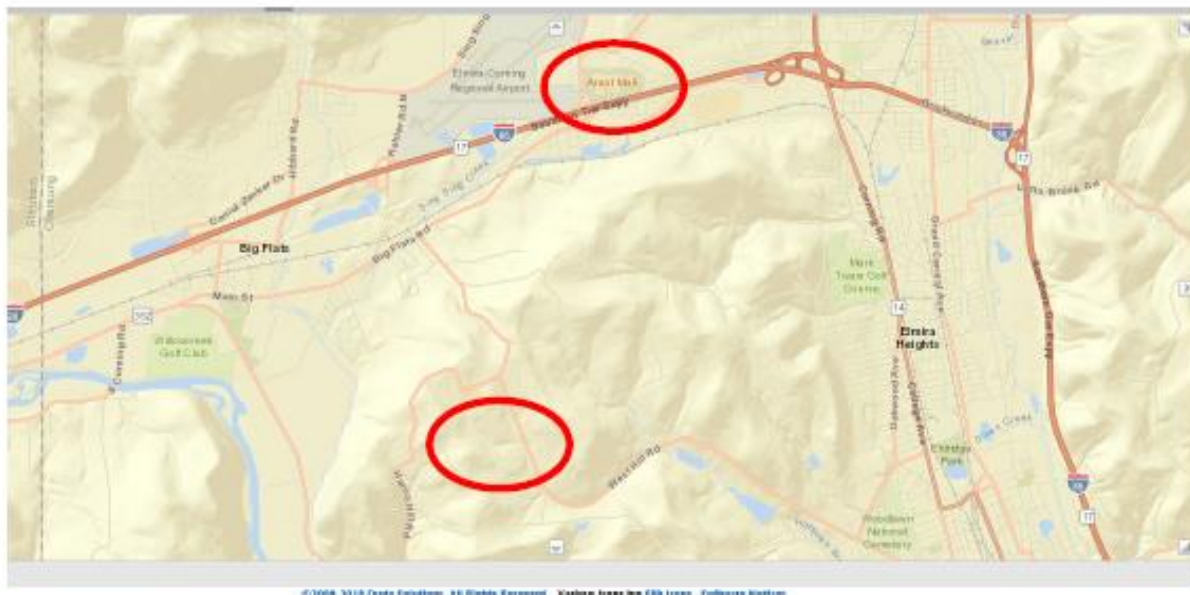
To: Chemung County EMO
 From: Town of Big Flats DPW
 Re: Identification of Temporary Disaster Housing Sites

As part of our town's hazard mitigation planning processes, as mandated by the New York State Department of Homeland Security and Emergency Services guidance, the Town of Big Flats identified several locations where temporary housing units could be placed in the event it becomes necessary. Immediate sheltering would still take place in the Big Flats community center or through arrangements with local motels, but longer-term temporary housing options may be required in certain disaster situations. We have identified the Harris Hill park and Arnot Mall parking lots as suitable locations for temporary housing.

Each of these locations could easily accommodate FEMA's temporary housing units and are in locations where utility connections can be made. Additionally, both are well outside the boundaries of FEMA flood zones and each has good access to local road networks. Our town leadership intends to formalize arrangements with both Chemung County leadership and the Arnot Mall management by way of Memorandums of Agreement.

The attached map shows approximate site locations.

Chris Austin
 Deputy Public Works Commissioner
 Town of Big Flats



Temporary Housing Locations – Harris Hill Park and Arnot Mall

Figure F-5. Temporary Housing Plan Town of Catlin

To Whom it May Concern:

As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), the State Standard below indicates that we must prepare for the possible need to house disaster victims:

Plan for Displaced Residents

Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

In the event that the Town of Catlin experiences an emergency that causes residents to relocate for an extended period of time, the Town would first identify any housing stock and lots currently available for sale or lease. If more space is still needed, the Town has identified the following site as a suitable temporary housing location:

Chambers Camp and retreat center
114 Campground Rd.
Beaver Dams, NY 14812
607-962-4292 Peter Moon Director

Potential Resources available on site:

260 summer living quarter bed
47 private cabins for possible use?
100 camper hook ups - water ,electric , sewer some are in seasonal use.
42 Campsite with - water and electric
Dining facility with 250 capacity
Full operational kitchen year round.
Vacate land 3-5 acres for potential use.
Self contained water system - operated to health dept. requirements.

The Town already has an agreement in place with the Camp for this purpose.

LaVerne Phelps
Town of Catlin, Supervisor
1448 Chambers Rd
Beaver Dams, NY 14812
607-739-5598
catlinsupervisor@gmail.com

Figure F-6. Temporary Housing Plan Town of Chemung

Chemung County- Temporary Housing for Disaster Recovery

As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), the State Standard below indicates that we must prepare for the possible need to house disaster victims:

Plan for Displaced Residents

Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

In the event that Chemung County experiences an emergency that causes residents to relocate for an extended period of time, the County would first identify any housing stock and lots currently available for sale or lease. If more space is still needed, the County has identified two sites that could potentially be used for temporary housing units, the Chemung County Fairgrounds and Harris Hill Park. These sites are not located in a special flood hazard area, and already have some amenities such as:

- bathhouses with toilet and shower facilities
- electric, water and sewer hook ups for recreational vehicle sites
- potable water
- kitchen/feeding facilities
- several acres of open space

Chemung County would be willing to share access to either of these sites for any municipality that could not identify usable land for this purpose in the event of an emergency within their jurisdiction.

Additionally, the County agrees that the Town of Chemung can use the Fairgrounds.



APPENDIX F: TEMPORARY HOUSING PLANS



Figure F-7. Temporary Housing Plan City of Elmira

City of Elmira- Temporary Housing for Disaster Recovery

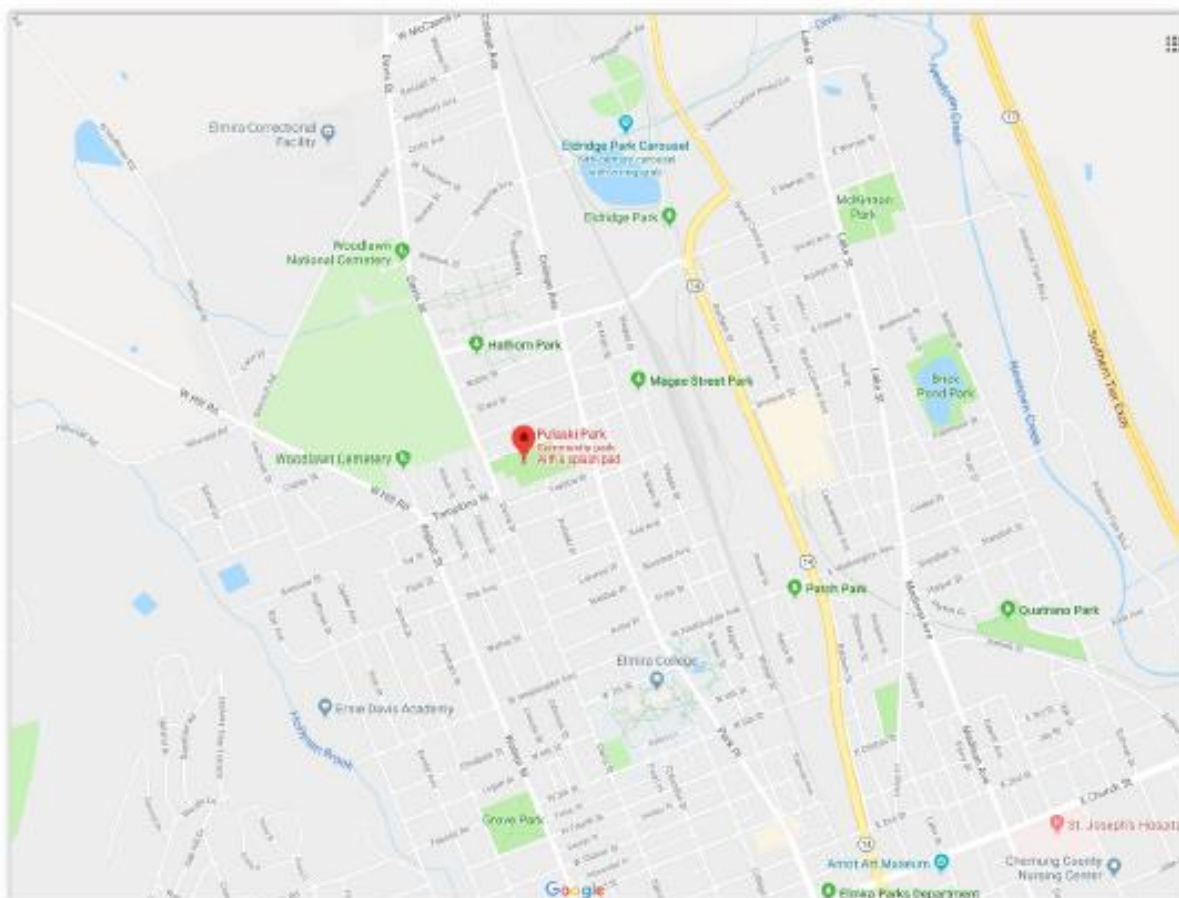
As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), the State Standard below indicates that we must prepare for the possible need to house disaster victims:

Plan for Displaced Residents

Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

In the event that the City of Elmira experiences an emergency that causes residents to relocate for an extended period of time, the City would first identify any housing stock and lots currently available for sale or lease. If more space is still needed, the City has identified Pulaski Park as a site that could potentially be used to install temporary housing units. This site is not located in a special flood hazard area, and would be accessible to the City water and sewer systems.

Pulaski Park



APPENDIX F: TEMPORARY HOUSING PLANS



Figure F-8. Temporary Housing Plan Town of Elmira

Date: December 12, 2018
To: Chemung County Deputy Director Fire and Emergency Management
From: David Sullivan, Town Supervisor
Subject: Temporary Disaster Housing Site Location

The Town of Elmira has identified three areas where temporary housing units may be placed to accommodate persons displaced by disaster events. None of the sites are in the SFHA. All have direct access to public roadways, public electricity, public water supply and public sewer system.

The sites shown on the attached page are:

- A A soccer field in Pirozzolo Park located on Grandview Av. extension.
- B A playground on the north side of Hendy Avenue School adjacent to West Church Street and Hendy Avenue.
- C A golf fairway belonging to the Elmira Country Club which is adjacent and parallel to West Clinton Street.

APPENDIX F: TEMPORARY HOUSING PLANS

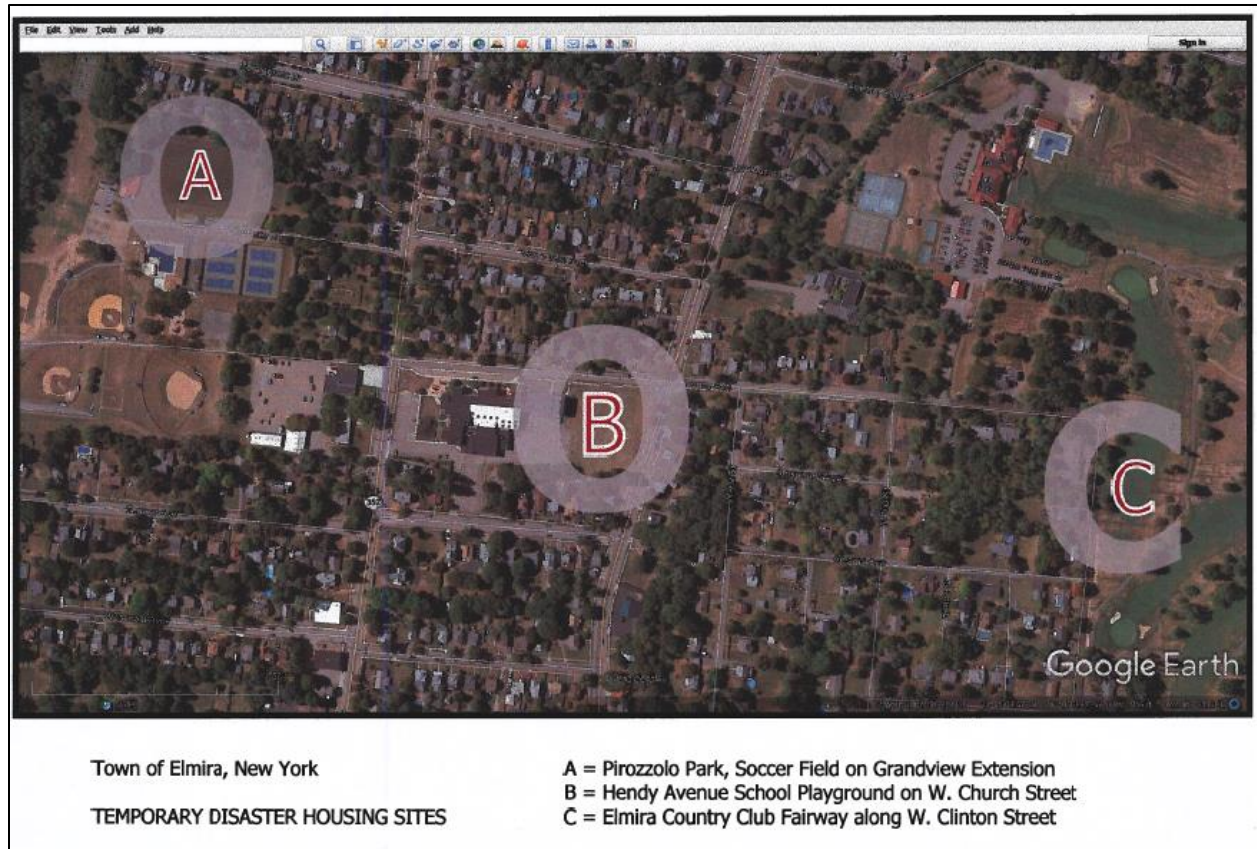


Figure F-9. Temporary Housing Plan Village of Elmira Heights

<p>Village of Elmira Heights Code Enforcement 215 Elmwood Avenue Elmira Heights, NY 14903 (607)734-7156 Phone (607)734-1607 Fax</p> <p>To: Chemung County EMO</p> <p>From: Village of Elmira Heights</p> <p>Re: Identification of Temporary Disaster Housing Sites</p> <p>Date: January 9, 2019</p> <hr/> <p>As part of our village hazard mitigation planning process, as mandated by the New York State Department of Homeland Security and Emergency Services guidance, the Village of Elmira Heights identified a couple locations where temporary housing units could be placed in the event it becomes necessary. Immediate sheltering would still take place in the Village of Elmira Heights Fire Station or through arrangements with local hotels, motels, but longer-term temporary housing options may be required in certain disasters situation We have identified the Edison High School and Cohen Middle School lots as suitable locations for temporary housing.</p> <p>Each of these locations could easily accommodate FEMA's temporary housing units and are in locations where utility connections can be made. Additionally, both are well outside the boundaries of FEMA flood zones and each has good access to local road networks. Our Village leadership intends to formalize arrangements with both Chemung County leadership and the Edison High School and Cohen Middle School management by way of Memorandums of Agreement.</p> <p>The attached maps shows approximate site locations</p> <p>Jeffrey L. Sweet Jr.</p> <p>Village of Elmira Heights NY code.elmiraheights@gmail.com 607-734-7156</p>

APPENDIX F: TEMPORARY HOUSING PLANS

Cohen Middle School



Edison High School



Figure F-10. Temporary Housing Plan Town of Erin

Town of Erin (Chemung County)- Temporary Housing for Disaster Recovery

As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), the State Standard below indicates that we must prepare for the possible need to house disaster victims:

Plan for Displaced Residents

Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

In the event that Erin experiences an emergency that causes residents to relocate for an extended period of time, the County has identified two sites that could potentially be used for temporary housing units, the Chemung County Fairgrounds and Harris Hill Park. These sites are not located in a special flood hazard area, and already have some amenities such as:

- bathhouses with toilet and shower facilities
- electric, water and sewer hook ups for recreational vehicle sites
- potable water
- kitchen/feeding facilities
- several acres of open space

Chemung County has noted that they are going to share access to either of these sites for any municipality that could not identify usable land for this purpose in the event of an emergency within that respective jurisdiction.





Figure F-11. Temporary Housing Plan Town of Horseheads

HORSEHEADS CODE ENFORCEMENT

Memo

To: Horseheads Town Board

From: Tom Skebey, Director of Code Enforcement/Floodplain Administrator

Date: 12/12/2018

Re: Temporary Disaster Housing sites identified

As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), State Standards indicate that we must prepare for the possible need to evacuate large numbers or residents to a safe area beyond the time residents would stay in an evacuation shelter.

We have identified three spaces in which alternate housing could be placed should an event necessitate removal of a large number of persons from their neighborhood because of unsafe conditions.

Location one is located at the Chemung County Fairgrounds off Grand Central Ave.

Locations two and three are located on Philo Road West off Miracle Mile.

All locations are located out of the mapped floodplain.

All locations have public utilities available.

A map on the next page shows the approximate locations of the three sites.

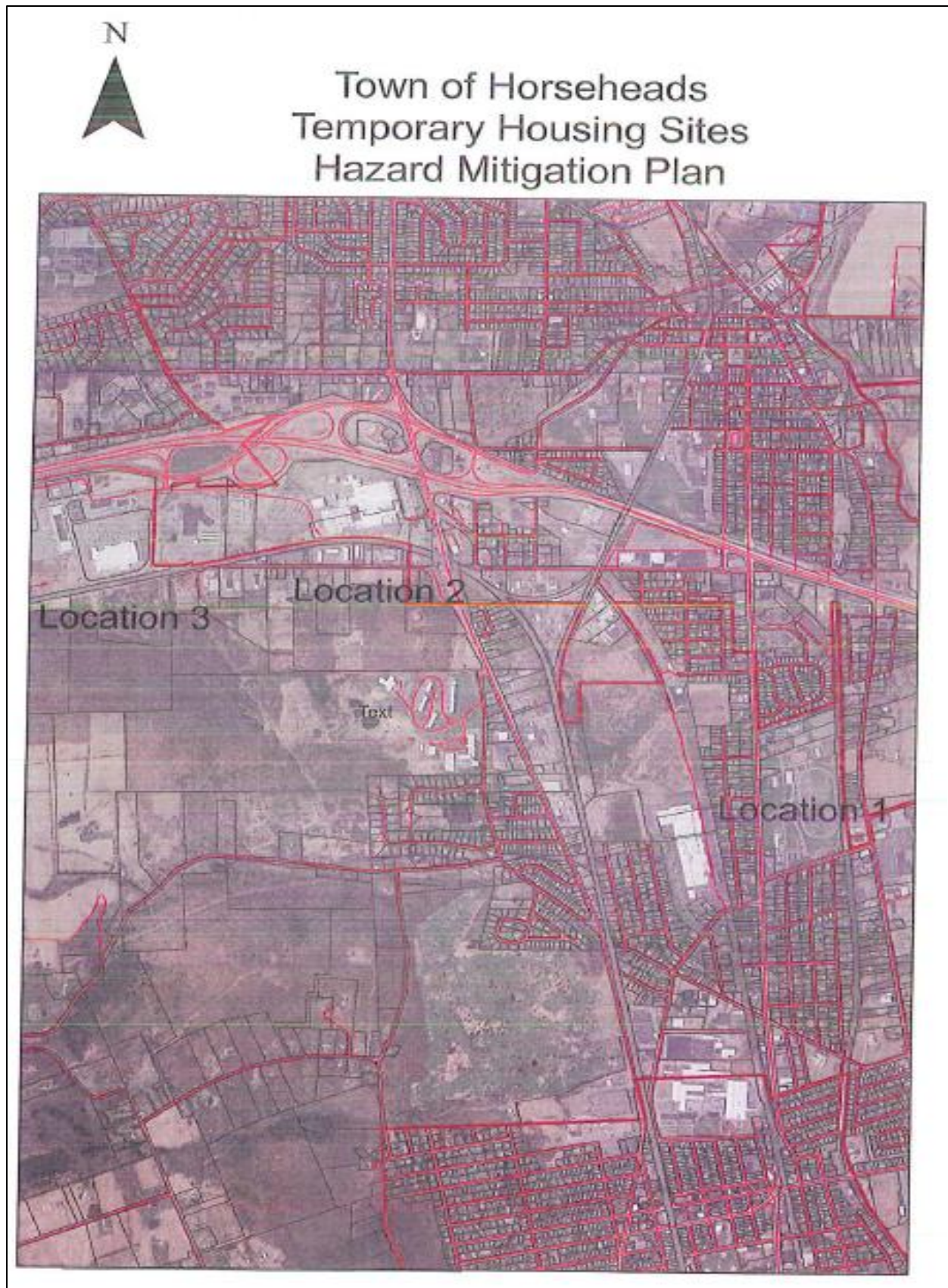


Figure F-12. Temporary Housing Plan Village of Horseheads

Village of Horseheads (Chemung County)- Temporary Housing for Disaster Recovery

As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), the State Standard below indicates that we must prepare for the possible need to house disaster victims:

Plan for Displaced Residents

Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

In the event that the Village of Horseheads experiences an emergency that causes residents to relocate for an extended period of time, the County has identified and offered two sites that could potentially be used for temporary housing units, the Chemung County Fairgrounds and Harris Hill Park. These sites are not located in a special flood hazard area, and already have some amenities such as:

- bathhouses with toilet and shower facilities
- electric, water and sewer hook ups for recreational vehicle sites
- potable water
- kitchen/feeding facilities
- several acres of open space

Chemung County has noted that they are going to share access to either of these sites for any municipality that could not identify usable land for this purpose in the event of an emergency within that respective jurisdiction.



APPENDIX F: TEMPORARY HOUSING PLANS



Figure F-13. Temporary Housing Plan Village of Millport

Village of Millport (Chemung County)- Temporary Housing for Disaster Recovery

As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), the State Standard below indicates that we must prepare for the possible need to house disaster victims:

Plan for Displaced Residents

Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

In the event that Millport experiences an emergency that causes residents to relocate for an extended period of time, the County has identified two sites that could potentially be used for temporary housing units, the Chemung County Fairgrounds and Harris Hill Park. These sites are not located in a special flood hazard area, and already have some amenities such as:


- bathhouses with toilet and shower facilities
- electric, water and sewer hook ups for recreational vehicle sites
- potable water
- kitchen/feeding facilities
- several acres of open space

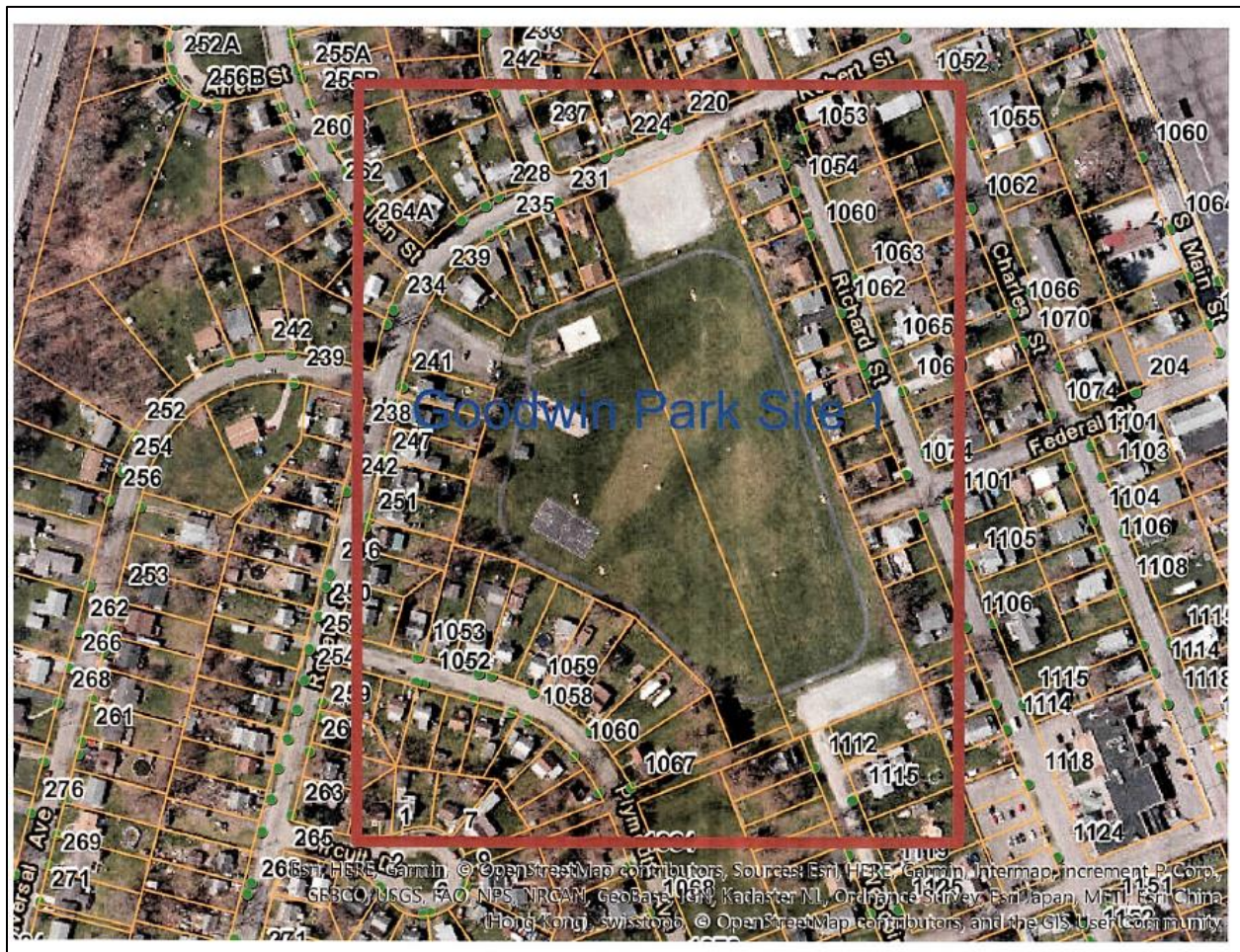
Chemung County has noted that they are going to share access to either of these sites for any municipality that could not identify usable land for this purpose in the event of an emergency within that respective jurisdiction.





Figure F-14. Temporary Housing Plan Town of Southport

	TOWN OF SOUTHPORT 1139 Pennsylvania Avenue • Elmira New York 14904 (607) 734-1548
TO:	Chemung County Hazard Mitigation Coordinator
FROM:	Kathleen Szerszen, Town Supervisor Town of Southport
DATE:	January 4, 2019
RE:	Temporary Disaster Housing site identification
<p>As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), State Standards indicate that we must prepare for the possible need to evacuate large numbers of residents to a safe area beyond the time residents would stay in an evacuation shelter.</p> <p>The Town of Southport has identified two spaces in which alternate housing could be placed should an event necessitates removal of a large number of persons from their neighborhood because of unsafe conditions. Both parcels are owned by the Town.</p> <p>Goodwin Park is located in the 500-year flood zone. Draxler Park is not located in a flood zone.</p> <p>Attached are the maps showing the approximate locations of the two sites and demonstrates that they are not located within a flood-prone area.</p> <p>Please contact me if you need additional information.</p> <p>Kathleen Szerszen, Town Supervisor Town of Southport kszerszen@townofsouthport.com 607.734.1548</p>	





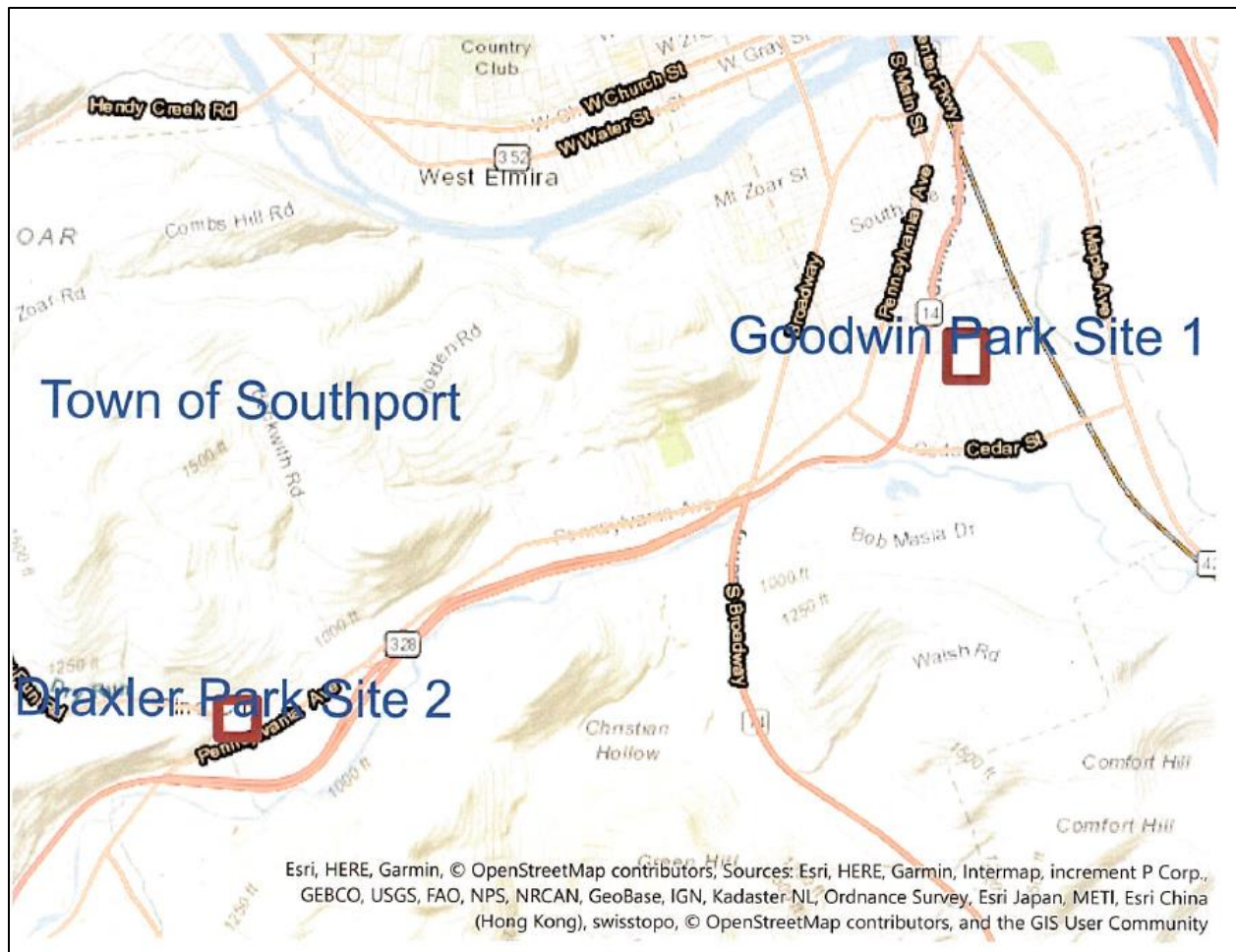


Figure F-15. Temporary Housing Plan Town of Van Etten

Town of Van Etten (Chemung County)- Temporary Housing for Disaster Recovery

As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), the State Standard below indicates that we must prepare for the possible need to house disaster victims:

Plan for Displaced Residents

Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

In the event that Van Etten experiences an emergency that causes residents to relocate for an extended period of time, the County has identified two sites that could potentially be used for temporary housing units, the Chemung County Fairgrounds and Harris Hill Park. These sites are not located in a special flood hazard area, and already have some amenities such as:

- bathhouses with toilet and shower facilities
- electric, water and sewer hook ups for recreational vehicle sites
- potable water
- kitchen/feeding facilities
- several acres of open space

Chemung County has noted that they are going to share access to either of these sites for any municipality that could not identify usable land for this purpose in the event of an emergency within that respective jurisdiction.



APPENDIX F: TEMPORARY HOUSING PLANS



Figure F-16. Temporary Housing Plan Town of Veteran

Town of Veteran (Chemung County)- Temporary Housing for Disaster Recovery

As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), the State Standard below indicates that we must prepare for the possible need to house disaster victims:

Plan for Displaced Residents

Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

In the event that Veteran experiences an emergency that causes residents to relocate for an extended period of time, the County has identified two sites that could potentially be used for temporary housing units, the Chemung County Fairgrounds and Harris Hill Park. These sites are not located in a special flood hazard area, and already have some amenities such as:

- bathhouses with toilet and shower facilities
- electric, water and sewer hook ups for recreational vehicle sites
- potable water
- kitchen/feeding facilities
- several acres of open space

Chemung County has noted that they are going to share access to either of these sites for any municipality that could not identify usable land for this purpose in the event of an emergency within that respective jurisdiction.



APPENDIX F: TEMPORARY HOUSING PLANS



Figure F-17. Temporary Housing Plan Village of Wellsburg

Village of Wellsburg (Chemung County)- Temporary Housing for Disaster Recovery

As part of the mitigation planning process outlined by the NY State Department of Homeland Security and Emergency Services (DHSES), the State Standard below indicates that we must prepare for the possible need to house disaster victims:

Plan for Displaced Residents

Intermediate and long-term housing options must be available for relocating displaced residents and maintain post-disaster social and economic stability.

In the event that the Village of Wellsburg experiences an emergency that causes residents to relocate for an extended period of time, the County has identified and offered two sites that could potentially be used for temporary housing units, the Chemung County Fairgrounds and Harris Hill Park. These sites are not located in a special flood hazard area, and already have some amenities such as:

- bathhouses with toilet and shower facilities
- electric, water and sewer hook ups for recreational vehicle sites
- potable water
- kitchen/feeding facilities
- several acres of open space

Chemung County has noted that they are going to share access to either of these sites for any municipality that could not identify usable land for this purpose in the event of an emergency within that respective jurisdiction.



APPENDIX F: TEMPORARY HOUSING PLANS



ANNEX A: TOWN OF ASHLAND

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JURISDICTION PROFILE

OVERVIEW

The Town of Ashland is located in Chemung County, New York, with a population just under 1,700. The town was named after the home of Henry Clay, and is located on the south border of the county, south of Elmira, New York. According to the United States Census Bureau, the town has a total area of 14.6 square miles, of which 14.2 square miles is land and 0.35 square miles, or 2.44%, is water. The Chemung River, a tributary of the Susquehanna River, flows through the town. The south town line of Ashland is the border of Pennsylvania. Figure A-1 shows the general location of the Town of Ashland.

TOWN OF ASHLAND CONTACT INFORMATION

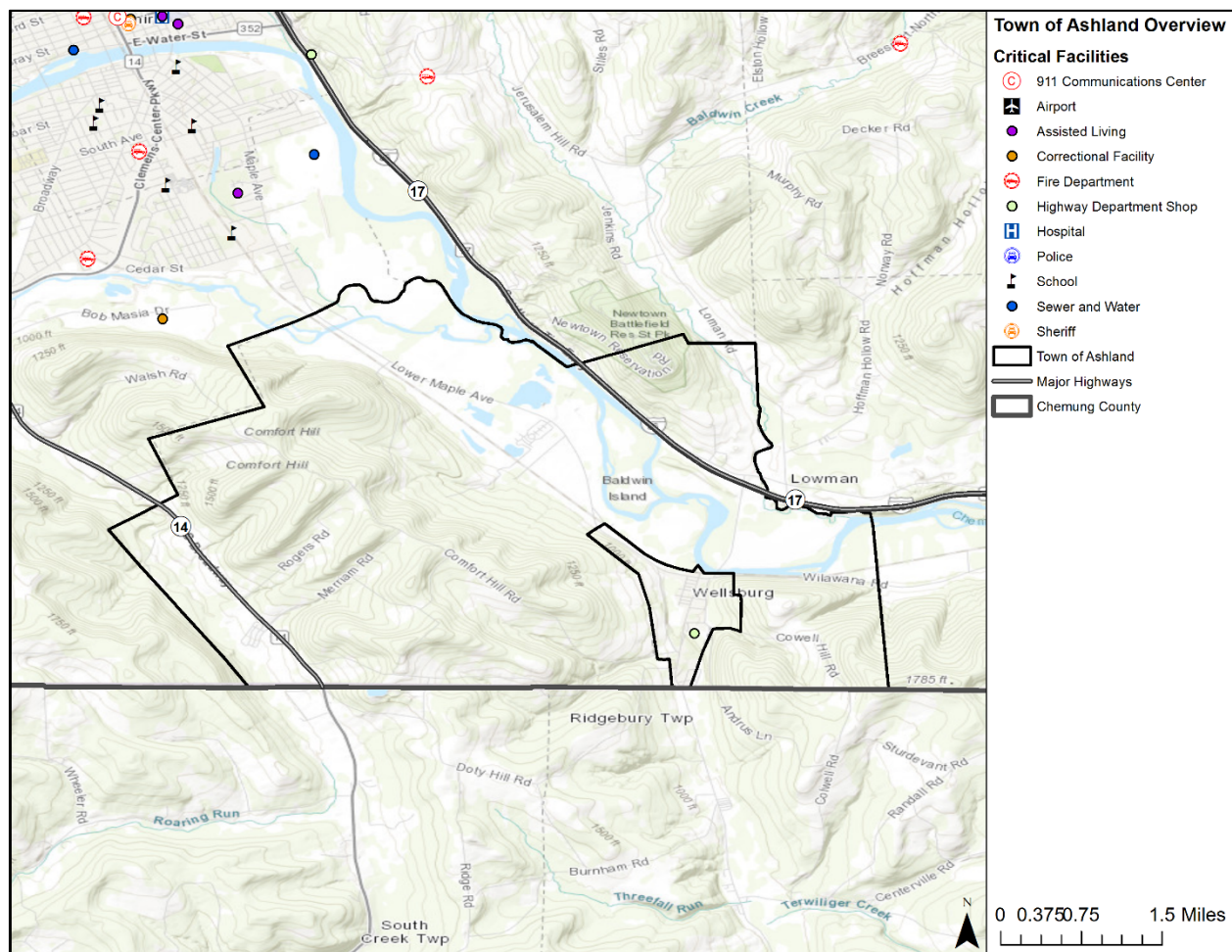
Name: Vern Robinson

Title: Mayor/Supervisor

Phone: (607)732-0723

Address: 3663 6th Street, Wellsburg, NY 14894

Email: tashland@stny.rr.com

Figure A-1. Town of Ashland Planning Area

POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Town of Ashland had a population of 1,695 residents. Table A-1 provides the population distribution within the Town of Ashland.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table A-1. Population Distribution for the Town of Ashland

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Ashland	1,695	1.9%	154	269

POPULATION GROWTH

The official 2010 Town of Ashland population is 1,695. Overall, the Town of Ashland experienced a decrease in population between 1980 and 2010 by 13.8%, or a decrease by 272 people. Table A-2 provides historic change rates in the Town of Ashland.

Table A-2. Population for the Town of Ashland, 1980-2010

JURISDICTIONS	1980 ²	1990 ³	2000 ⁴	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANG E 2000- 2010	PERCENT OF CHANGE
Town of Ashland	1,967	1,966	1,951	1,695	-272	-13.8%	-256	-13.1%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Town of Ashland might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table A-3, as provided Cornell University's Program on Applied Demographics⁵. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

³ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁴ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁵ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table A-3. Chemung County Population Projections

CountyLAND AREA (SQ MI)		2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

HAZARD DESCRIPTION, LOCATION, EXTENT AND HISTORICAL OCCURENCES

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Town of Ashland, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Town of Ashland experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Town of Ashland is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Town of Ashland are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Town of Ashland:

Table A-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Ashland	1 Highway Department Shop

Population over 65 in the Town of Ashland is estimated at 21.2% of the total population or an estimated total of 310⁶ potentially vulnerable residents in the planning area based on age (Table A-5).

Table A-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Town of Ashland	310

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL AND LIGHTNING)

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table A-6 depicts historical occurrences of thunderstorm wind events for the Town of Ashland according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 2 thunderstorm wind events are known to have impacted the Town of Ashland, based upon NCEI records.

Table A-6. Historical Thunderstorm Wind Events, 1955-2018⁷⁸

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Ashland	5/26/2011	7:25 PM	58	0	0	\$11,134	\$0
Town of Ashland	5/26/2011	7:59 PM	58	0	0	\$5,567	\$0
Town of Ashland Totals				0	0	\$16,701	

Based on the list of historical thunderstorm wind events for the Town of Ashland, no reported events have occurred since the 2012 Plan.

HAIL

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of hail events for the Town of Ashland. Historical hail events are often provided on a

⁶ US Census Bureau 2016 data for the Town of Ashland.

⁷ Damages are reported from January 1955 through June 2018.

⁸ Magnitude is listed when available. Damage values are in 2018 dollars.

county-wide basis in the NCEI database. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the Town of Ashland. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Ashland can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Town of Ashland is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 278 manufactured homes (approximately 38.1%) located in the Town of Ashland (Table A-7). In addition, 65.3% (approximately 476 structures) of the residential structures in the Town of Ashland were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table A-7. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Ashland	278	476

The following critical facilities (Table A-8) would be vulnerable to thunderstorm events in the Town of Ashland:

Table A-8. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Ashland	1 Highway Department Shop

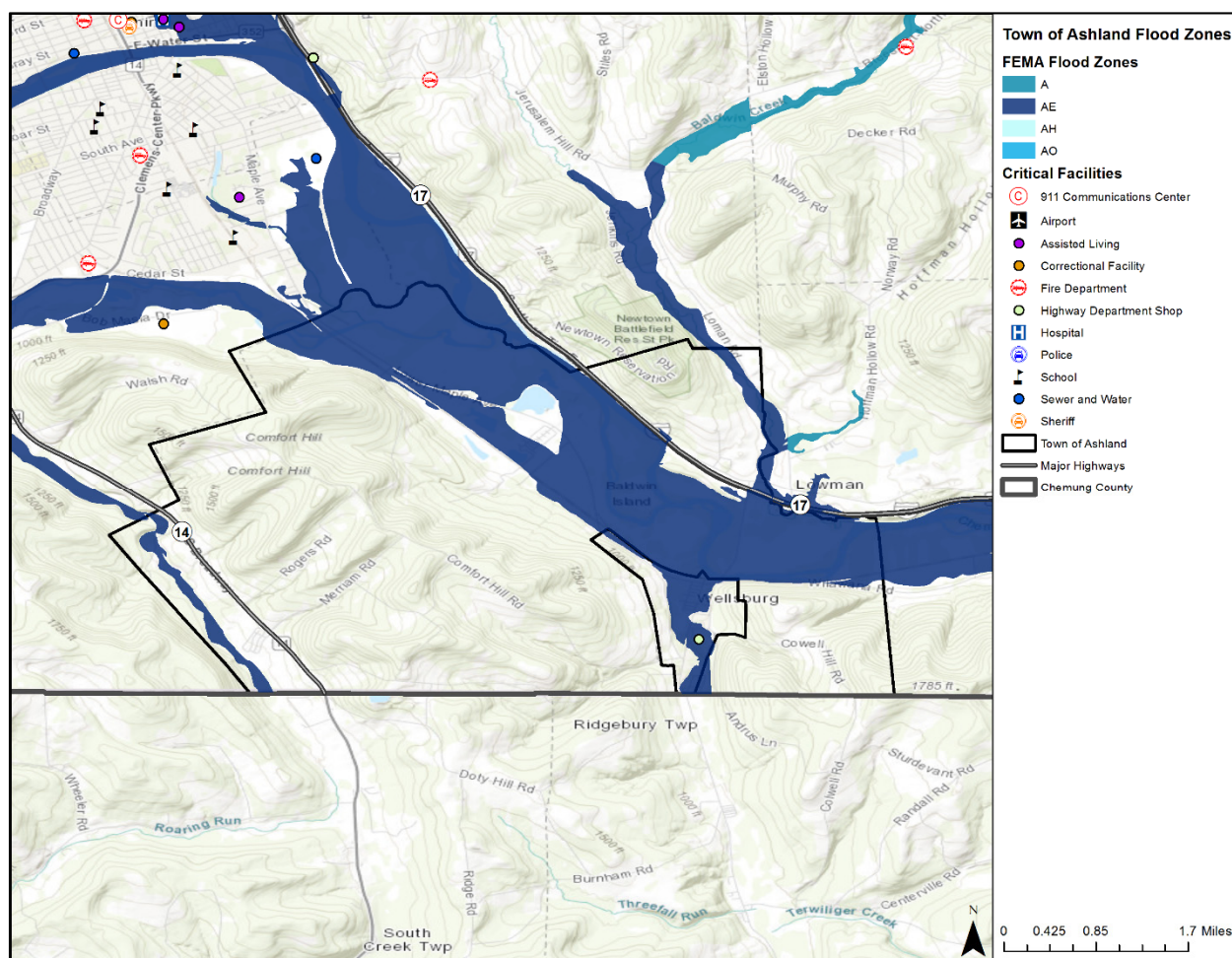
Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Ashland has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Ashland would be “Limited,” with minor quality of life lost, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$16,701 having an approximate annual loss estimate of \$263 (Table A-9).

Table A-9. Potential Annualized Losses for the Town of Ashland

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Ashland	\$16,701	\$263

FLOOD**HAZARD DESCRIPTION, LOCATION AND EXTENT**

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. Full flood zone delineations with elevations are available in the Town of Ashland. The location of estimated flood zones for the Town of Ashland, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure A-2.

Figure A-2. Estimated Flood Zones in the Town of Ashland

HISTORICAL OCCURRENCES

Table A-10 depicts historical occurrences of flood events for the Town of Ashland according to the National Centers for Environmental Information (NCEI) data. From January 1996 to June 2018, 1 flood event was known to have impacted the Town of Ashland, based upon NCEI records. Flood events are often reported on a county-wide basis, or under-reported for individual municipalities, particularly in small communities such as the Town of Ashland.

Table A-10. Historical Flood Events, 1996-2018⁹

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Ashland	1/25/2010	0	0	\$0	\$0

Based on the list of historical flood events for the Town of Ashland, no reported events have occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Ashland can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Town of Ashland is highly likely.

VULNERABILITY AND IMPACT

Table A-11 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table A-11. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Town of Ashland	None

Historic loss estimates due to flood are presented in Table A-12 below.

⁹ Only recorded events with fatalities, injuries, and/or damages are listed, values are in 2018 dollars. Events reported from January 1996 through June 2018.

Table A-12. Potential Annualized Losses, 1996-2018¹⁰

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Ashland	1	0	0	\$0	\$0

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table A-13 depicts the level of impact for the Town of Ashland.

Table A-13. Town of Ashland Impact

JURISDICTION	IMPACT	DESCRIPTION
Town of Ashland	Limited	The Town of Ashland could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Town of Ashland currently participates in the National Flood Insurance Program as well as the Community Rating System and has in place a flood damage prevention ordinance that includes standards above the minimum FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Town of Ashland has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Town of Ashland as a high risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. The Town of Ashland has a designated floodplain administrator. The Ashland floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the Town of Ashland outlines the minimum requirements for development in special flood hazard areas. Table A-14 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table A-14. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Town of Ashland	07/30/2008	07/30/2013	Good Standing	11

¹⁰ Events reported from January 1996 through June 2018.

REPETITIVE LOSS

Table A-15 shows repetitive loss and severe repetitive loss properties for the Town of Ashland.

Table A-15. Repetitive Loss and Severe Repetitive Loss Properties

JURISDICTION	BUILDING TYPE	NUMBER OF STRUCTURES	NUMBER OF LOSSES
Town of Ashland	Single Family	2	4
	2-4 Family	2	4

TORNADO

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of tornado events for the Town of Ashland. Historical tornado events are often provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities, such as the Town of Ashland, are impacted. Tornado events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Town of Ashland can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Town of Ashland is likely.

VULNERABILITY AND IMPACT

The U.S. Census data indicates a total of 278 manufactured homes (Table A-16) located in the Town of Ashland (38.1% of housing units). In addition, 65.3% (approximately 476 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table A-16. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Ashland	278	476

The following critical facilities would be vulnerable to tornado events in the Town of Ashland:

Table A-17. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Ashland	1 Highway Department Shop

The average loss estimate of property and crop is \$0 (in 2018 dollars), having an approximate annual loss estimate of \$0 (Table A-18). Based on historic loss and damages, the impact of tornado on the Town of Ashland can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table A-18. Potential Annualized Losses, 1983-2018¹¹

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Ashland	\$0	\$0

LANDSLIDE

The Town of Ashland has no known areas susceptible or prone to landslide (Section 9). The Town Ashland has no known historical occurrences of landslide and does not anticipate any landslide events in the future. The municipality determined that this hazard is not a threat to the township and therefore does not require further analysis.

¹¹ Events recorded from January 1983 through June 2018.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Removal of gravel in Bentley Creek deposited by 2011 storms. If PL-566 is approved, will incorporate debris removal and maintenance. But must remove gravel now before next high water, estimated cost, \$500K- \$1 Mill 2. Ashland Town line to first bridge on Maple Ave. 3. Maple Ave bridge to Chemung River.	Cost	\$300,000
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project 1 is complete. Project 2 and 3 were deemed to be unnecessary. Action will be deleted.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in Floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Home owner funding
				Level of Protection	100-year storm
				Damages Avoided; Evidence of Success	1 house elevated. Funding not pursued for additional buyouts. Action will be deleted.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the stormwater Coalition for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in the Plan Update.
Flood -10	Relocate Fire Department Building	Flood	Complete various construction and maintenance projects and create a schedule for ongoing maintenance of completed projects. 1. Robinson Rd- install larger capacity box culvert, remove current smaller metal pipe 2. Install rip-rap in several areas to armor banks, both Tyler Run and Bentley Creek.	Cost	Staff time, materials and equipment
				Level of Protection	10-year storm
				Damages Avoided; Evidence of Success	Project 1 is complete. Project 2- Bentley Creek is complete, Tyler Run is not. Action will be included in Plan Update.

ANNEX A: TOWN OF ASHLAND

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood -12	Relocate Fire Department Building	Flood	Assist the Wellsburg Volunteer Fire Department in finding a new location. Town and Village working cooperatively to secure grant funding and purchase land. Have land identified and plan for fill to ensure facility has 2 ft. freeboard.	Cost	\$2.5 Million
				Level of Protection	100-year storm
				Damages Avoided; Evidence of Success	Project complete.
Flood -14	Educate Property Owners	Flood	Promote the use of flood proofing techniques for retrofitting existing flood-prone development by distributing educational materials. Code Enf/Fldpln Admins have taken a continuing education course, and have educational packets created by Chemung County and STC with Mitigation Grant funds. Flood proofing info packets were distributed to residents after TS Lee, and presentation made at Village mtg. for residents.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Materials have been made available on the County website and brochures are provided for annual mailings to residence. Project is county wide. Action will be included in Plan Update.

NEW MITIGATION ACTIONS

Tyler Run (Creek) Relocation/Realignment		Town of Ashland – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	During larger storm events, Tyler Run inundates both Church and Front Streets within the Village of Wellsburg (located within the Town of Ashland), resulting in the flooding of businesses and residences in both the Village and the Town.		
Action or Project Intended for Implementation			
Description of the Solution	Work with Chemung County Soil and Water to realign Tyler Run in a direct route to Bentley Creek and away from residences and businesses.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	100-year storm	Estimated Benefits (losses avoided)	This project would significantly reduce the flooding experienced in the Town, especially for the homes and businesses on Front and Church Streets.
Useful Life	50 yrs.		
Estimated Cost	\$400,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding
Responsible Organization	Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	Soil and Water District work schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Flood damages will continue
	Improvements to increase capacity of existing channel and culverts	\$650,000	Work would involve replacement of existing culverts and work on private property.
	Installation of flood control reservoir in the Tyler Run watershed	\$1,000,000	Work would involve construction of reservoir on private property. Reservoir would be a high hazard dam.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Town of Ashland – 2	
Risk/Vulnerability			
Hazard of Concern	Winter Storm, Thunderstorm, Flood, Tornado, Landslide		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$5,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Floodplain Management		Town of Ashland – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Town of Ashland – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Promote the use of floodproofing techniques for retrofitting existing flood-prone development by distributing educational materials. Materials have been made available on the County website and brochures are provided for annual mailings to residence.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$10,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$10,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Automated Rain Gauges and Stream Gauges		Town of Ashland – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Heavy rain often occurs in the hills above the residential area of Ashland, while the valley is getting little to no rain. The runoff causes unexpected flash flooding in the Ashland neighborhoods due to debris blocking drainage structures.		
Action or Project Intended for Implementation			
Description of the Solution	Install a precipitation and automated stream gauge upstream of Wellsburg (located within the limits of the Town of Ashland) to alert the Village when heavy rain or sharp stream rises are occurring to the south. The Village could have some advanced warning of possible flash flooding and could better respond to these events. Can also connect these rain gauges to a regional gauge system that tracks precipitation and river levels in neighboring towns, allowing for improved situational awareness in any rain event.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10-year storm	Estimated Benefits (losses avoided)	Would allow for Town response to problem areas before significant flooding started to occur, reducing or preventing flood damage to private property and homes. Would share data with other agencies for situational awareness.
Useful Life	25 years		
Estimated Cost	\$7,500		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	6 months	Potential Funding Sources	Grant funding, possible funding or in-kind assistance from Environmental Emergency Services (EES).
Responsible Organization	Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	Town and EES work plans
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur
	Provide rain gauges & Train select residents to be rain gauge readers	\$1,500	Would have to depend on residents to correctly install gauge, correctly read and report heavy rain amounts as they occur.
	Install only one gauge at a site that may serve all of residential area.	\$3,750	Would not have as accurate data as two sites for entire residential area. Not a significant cost savings.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Emergency Generator for Town of Ashland Fire Station			Town of Ashland – 6
Risk/Vulnerability			
Hazard of Concern	Flood, Thunderstorm, Winter Storm, Tornado		
Description of the Problem	During flooding, severe storms and tornados, the Fire Station serves as the Emergency Operations Center (EOC) as well. Power outages are likely and render the facility useless. Within the Town Hall, there are lights, computers, heat, communications, etc., which all rely on electricity.		
Action or Project Intended for Implementation			
Description of the Solution	Installation of an emergency generator with hardwired quick connections for the Fire Station.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	The Fire Station and Emergency Operations Center will remain operational during power outages.
Useful Life	50 yrs.		
Estimated Cost	\$250,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	Town improvements schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make building generator ready	\$100,000.00	Would still be without power until a generator from State is requested through Emergency Management.
	Try to find another facility with power to use as EOC	Dependent on facility being used	Would have to move all operations to another location. Impractical to move EOC to another location.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		Town of Ashland – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Ashland Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Ashland	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	TOWN OF ASHLAND
Capital Improvements Plan	x
Master or Comprehensive Plan	
Community Wildfire Protection Plan	x
Continuity of Operations	x
Economic Development Plan	x
Emergency Operations Plan	x
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	x
Land Use Plan	x
Open Space Plan	x
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	x
Watershed Protection Plan	x
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	x
Real Estate Disclosure Requirements	x
Site Plan Review Requirements	x
Stormwater Ordinance	x
Subdivision Regulations	x
Watershed Ordinance	

ANNEX A: TOWN OF ASHLAND

COMMUNITY CAPABILITY CHECKLIST	TOWN OF ASHLAND
Zoning Ordinance/Land Use Restrictions	x
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	x
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	
Public Education/Awareness Programs	x
Stream Maintenance Program	x
Storm Drainage Systems Maintenance Program	x
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	
Environmental Conservation Specialist	
Floodplain Administrator	x
GIS Specialist	x
Personnel with Hazard Knowledge	x
Planner	
Public Information Official	x
Resource Development/ Grant Writer	

ANNEX B: TOWN OF BALDWIN

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JURISDICTION PROFILE

OVERVIEW

The Town of Baldwin is located in Chemung County, New York, with a population just under 900. The town was named after Thomas and Waterman Baldwin, two of the earliest settlers of the area. The town lies in the southeastern section of Chemung County, east of Elmira. It is part of the Elmira Metropolitan Statistical Area. According to the United States Census Bureau, the town has a total area of 25.8 square miles, of which 25.9 square miles is land and 0.02 square miles is water. The Town features a number of creeks including the Baldwin Creek, the Wynkoop Creek and Cayuta Creek. Figure B-1 shows the general location of the Town of Baldwin.

TOWN OF BALDWIN CONTACT INFORMATION

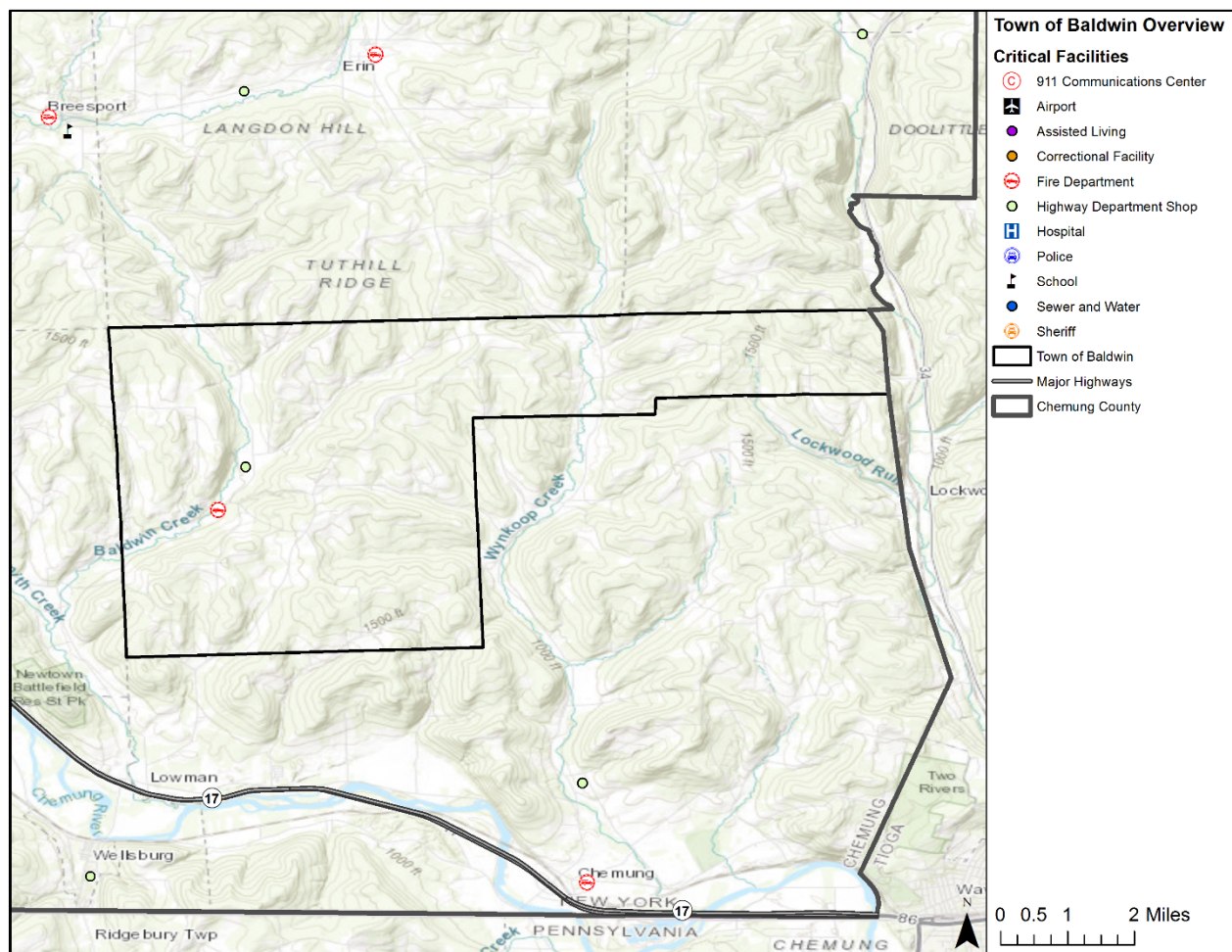
Name: Russell Purvis

Title: Mayor/Supervisor

Phone: (607)398-7208

Address: 622 Breesport N. Chemung Road,
Lowman, NY 14861

Email: townbaldwin@yahoo.com

Figure B-1. Town of Baldwin Planning Area

POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Town of Baldwin a population of 832 residents. Table B-1 provides the population distribution within the Town of Baldwin.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table B-1. Population Distribution for the Town of Baldwin

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Baldwin	832	0.9%	70	55

POPULATION GROWTH

The official 2010 Town of Baldwin population is 832. Overall, the Town of Baldwin experienced a decrease in population between 1980 and 2010 by 6.7%, or a decrease by 60 people. Table B-2 provides historic change rates in the Town of Baldwin.

Table B-2. Population for the Town of Baldwin, 1980-2010

JURISDICTION	1980 ²	1990 ³	2000 ⁴	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Town of Baldwin	892	829	853	832	-60	-6.7%	-21	-2.5%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Town of Baldwin might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table B-3, as provided Cornell University's Program on Applied Demographics⁵. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

³ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁴ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁵ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table B-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

HAZARD DESCRIPTION, LOCATION, EXTENT & HISTORICAL OCCURENCES

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Town of Baldwin, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Town of Baldwin experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Town of Baldwin is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Town of Baldwin are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Town of Baldwin:

Table B-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Baldwin	1 Fire Station, 1 Highway Department Shop

Population over 65 in the Town of Baldwin is estimated at 21.7% of the total population or an estimated total of 176⁶ potentially vulnerable residents in the planning area based on age (Table B-5).

Table B-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Town of Baldwin	176

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of thunderstorm events for the Town of Baldwin. Historical thunderstorm events are often provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities, such as the Town of Baldwin, are impacted. Thunderstorm wind events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HAIL

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of hail events for the Town of Baldwin. Historical hail events are often provided on a county-wide basis in the NCEI database. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the Town of Baldwin. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

⁶ US Census Bureau 2016 data for the Town of Baldwin.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Baldwin can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Town of Baldwin is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 172 manufactured homes (approximately 37.4%) located in the Town of Baldwin (Table B-6). In addition, 61.1% (approximately 281 structures) of the residential structures in the Town of Baldwin were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table B-6. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Baldwin	172	281

The following critical facilities (Table B-7) would be vulnerable to thunderstorm events in the Town of Baldwin:

Table B-7. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Baldwin	1 Fire Station, 1 Highway Department Shop

Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Baldwin has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Baldwin would be "Limited," with minor quality of life lost, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$16,701 having an approximate annual loss estimate of \$263 (Table B-8).

Table B-8. Potential Annualized Losses for the Town of Baldwin

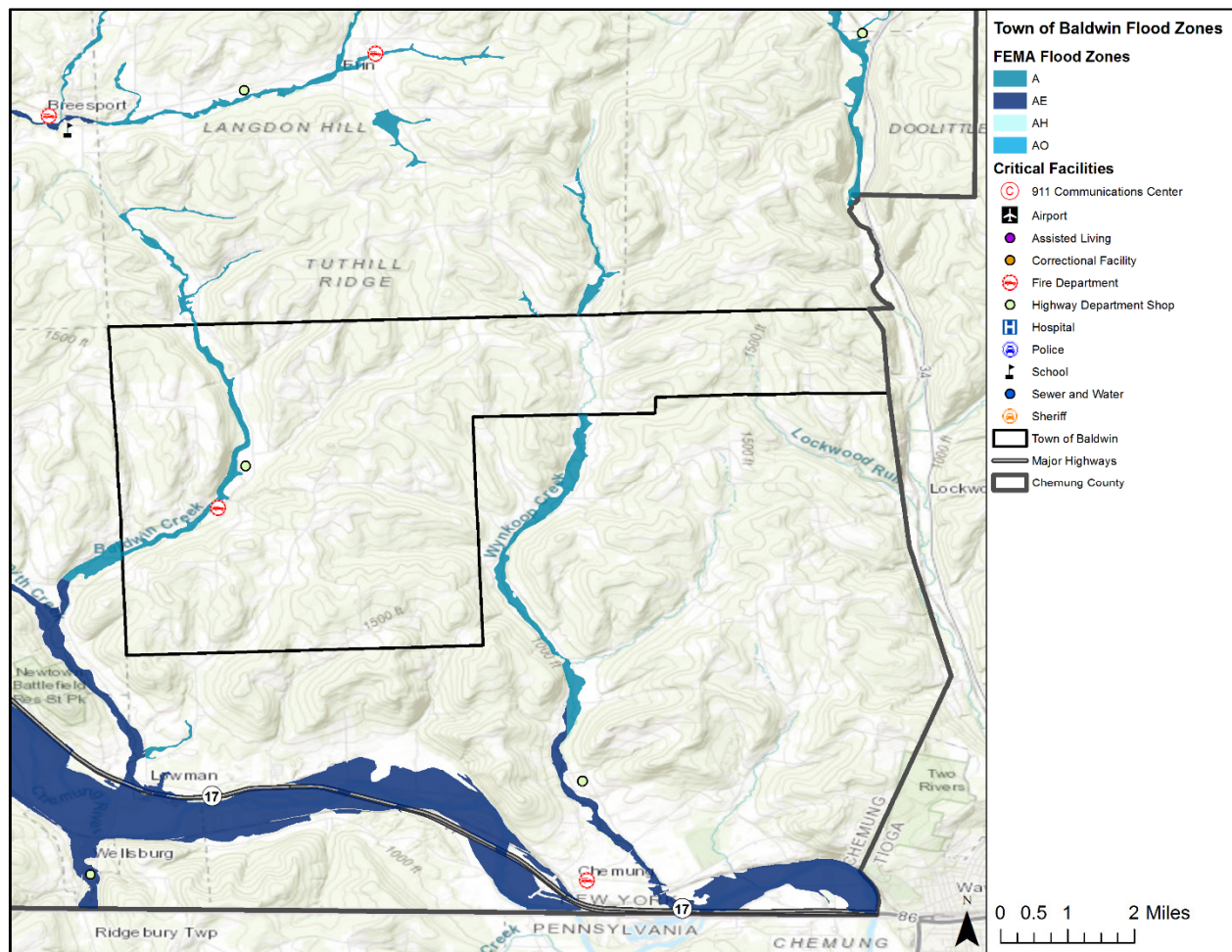
JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Baldwin	\$16,701	\$263

FLOOD

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. A limited flood hazard boundary map with no elevations is available in the Town of Baldwin. The location of estimated flood zones for the Town of Baldwin, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure B-2.

Figure B-2. Estimated Flood Zones in the Town of Baldwin



HISTORICAL OCCURRENCES

Historical flood events may be reported on a county-wide basis, specifically when it comes to smaller communities with limited capacity. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for participating jurisdictions. According to historical records for the Chemung County Planning Area, the Town of Baldwin can expect to experience a flood event every year.

PROBABILITY OF FUTURE EVENTS

Incidents reported at the county level provide a more robust risk assessment for every participating jurisdiction, particularly smaller jurisdictions. According to historical records for the Chemung County Planning Area, the Town of Baldwin can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Town of Baldwin is highly likely.

VULNERABILITY AND IMPACT

Table B-9 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table B-9. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Town of Baldwin	None

Historic loss estimates due to flood are presented in Table B-10 below.

Table B-10. Potential Annualized Losses, 1996-2018⁷

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Baldwin	0	0	0	\$0	\$0

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table B-11 depicts the level of impact for the Town of Baldwin.

Table B-11 Town of Baldwin Impact

JURISDICTION	IMPACT	DESCRIPTION
Town of Baldwin	Limited	The Town of Baldwin could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Town of Baldwin currently participates in the National Flood Insurance Program and is in good standing. The community has in place a flood damage prevention ordinance that includes standards that meet the minimum standard FEMA requirement.

⁷ Events reported from January 1996 through June 2018.

NFIP COMPLIANCE AND MAINTENANCE

The Town of Baldwin has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Town of Baldwin as a low to moderate risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. The Town of Baldwin has a designated floodplain administrator. The Baldwin floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the Town of Baldwin outlines the minimum requirements for development in special flood hazard areas. Table B-12 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table B-12. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Town of Baldwin	1/12/2017	4/04/2006	Good Standing	9

REPETITIVE LOSS

Table B-13 shows repetitive loss and severe repetitive loss properties for the Town of Baldwin.

Table B-13. Repetitive Loss and Severe Repetitive Loss Properties

JURISDICTION	BUILDING TYPE	NUMBER OF STRUCTURES	NUMBER OF LOSSES
Town of Baldwin	Single Family	4	8

TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of tornado events for the Town of Baldwin. Historical tornado events are often provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities, such as the Town of Baldwin, are impacted. Tornado events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level

events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Town of Baldwin can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Town of Baldwin is likely.

VULNERABILITY AND IMPACT

The U.S. Census data indicates a total of 172 manufactured homes (Table B-14) located in the Town of Baldwin (37.4% of housing units). In addition, 61.1% (approximately 281 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table B-14. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Baldwin	172	281

The following critical facilities would be vulnerable to tornado events in the Town of Baldwin:

Table B-15. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Baldwin	1 Fire Station, 1 Highway Department Shop

The average loss estimate of property and crop is \$0 (in 2018 dollars), having an approximate annual loss estimate of \$0 (Table B-16). Based on historic loss and damages, the impact of tornado on the Town of Baldwin can be considered "Limited," with less than 10 percent of property expected to be destroyed.

Table B-16. Potential Annualized Losses, 1983-2018⁸

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Baldwin	\$0	\$0

LANDSLIDE

The Town of Baldwin has no known areas susceptible or prone to landslide (Section 9). The Town Baldwin has no known historical occurrences of landslide and does not anticipate any landslide events in the future. The municipality determined that this hazard is not a threat to the township and therefore does not require further analysis.

⁸ Events recorded from January 1983 through June 2018.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Baldwin Creek, Wyncoop Creek, Chapman Road Creek, Tut Hill Ridge, Federal Road, Elston Hollow, Grover Road projects were completed. Other locations have not been completed. Action will be included in Plan Update.
Flood-11a	Improve Drainage System	Flood	Upgrade all dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project is partially completed. Action will be included in Plan Update.

NEW MITIGATION ACTIONS

Elston Hollow Road Bridge Replacement		Town of Baldwin – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Elston Hollow bridge is undersized and in need of replacement. In addition, the hydraulic capacity of this structure may not comply with commonly accepted standards. Floodwaters can cause debris to back up at the bridge, exacerbating flooding, damaging the bridge and causing scour and erosion to embankments at the bridge site.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Elston Hollow Road bridge shall be replaced with a new box culvert. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) and guide railing shall be installed. The existing roadway within the limits of construction shall be repaved.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new box culvert with headwalls and guiderail will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Baldwin Administration	Local Planning Mechanisms to be Used in Implementation, if any	Town Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing bridge with bridge structure (concrete abutments & steel superstructure)	>\$250,000	More expensive than box culvert option
	Eliminate Elston Hollow Road Bridge crossing	<\$30,000	Not practicable. Crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Harrington Road (near Elston Hollow Road) Culvert Replacement			Town of Baldwin – 2
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Harrington Road culvert is undersized and in need of replacement. The hydraulic capacity of this structure may not comply with commonly accepted standards.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Harrington Road culvert shall be replaced with a new culvert. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) may be installed.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new culvert with headwalls and guiderail will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$30,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Baldwin	Local Planning Mechanisms to be Used in Implementation, if any	Town Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing bridge with bridge structure (concrete abutments & steel superstructure)	>\$60,000	More expensive than culvert replacement option
	Eliminate Elston Hollow Road Bridge crossing	>\$7,000	Not practicable. Crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Nixon Culvert Replacement		Town of Baldwin – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Nixon Road culvert is undersized and in need of replacement. The hydraulic capacity of this structure may not comply with commonly accepted standards. Floodwaters can cause debris to back up at the bridge, exacerbating flooding, damaging the bridge and causing scour and erosion to embankments at the culvert site.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Nixon Road culvert shall be replaced with a new culvert. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) may be installed.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new culvert will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$30,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Baldwin	Local Planning Mechanisms to be Used in Implementation, if any	Town Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culvert with bridge structure (concrete abutments & steel superstructure)	>\$60,000	More expensive than culvert replacement option
	Eliminate Nixon Road crossing	>\$7,000	Not practicable. Crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Town of Baldwin – 4	
Risk/Vulnerability			
Hazard of Concern	Winter Storm, Thunderstorm, Flood, Tornado, Landslide		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Baldwin Administration	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$5,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Stream Stabilization Program		Town of Baldwin – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Extreme rainfall events result in high stormwater flow rates, which result in the destabilization of stream channels (including streambanks), that causes erosion and deposition within these streams, as well as stream migration. The erosion of streambanks and migration of stream channels can jeopardize adjacent buildings, bridges, culverts, roadways, utilities, and other infrastructure.		
Action or Project Intended for Implementation			
Description of the Solution	The Chemung County Soil & Water District has a current program to stabilize streams and streambanks. This program will be expanded and implemented, to correct destabilized and migrated streams that pose risks to existing infrastructure. Continue work on Jackson Farm.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year Storm Event (min.)	Estimated Benefits (losses avoided)	Expansion and implementation of this program would result in prompt repairs to destabilized streams; improved protection for adjacent infrastructure; improved safety for motorists; and reduced sediment reaching waterbodies.
Useful Life	50 years		
Estimated Cost	Dependent upon stream and extent of damage		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Town of Baldwin	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Install retention/detention ponds to reduce impact to streams during heavy rain events.	Dependent on size, location and number of ponds required to lessen stream impacts	Less cost beneficial; Potential environmental impacts
	Proposed action	Dependent upon stream and extent of damage	Considered the best alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Dirt Road Upgrades		Town of Baldwin – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excessive rain causes dirt roads to turn into mud soup and can cause ditches to overflow. Road improvements are needed.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year	Estimated Benefits (losses avoided)	Improved hydraulic capacity; Reduction in sediment build-up issues; Improved reliability for roadway; Improved safety for motorists; Improved aquatic habitat of stream
Useful Life	50 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources
Responsible Organization	Town of Baldwin	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	\$150,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		Town of Baldwin – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Baldwin Flood Insurance Rate Maps were developed from a limited flood study and currently have no base flood elevations. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Baldwin	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	Town of Baldwin
Capital Improvements Plan	
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	
Economic Development Plan	
Emergency Operations Plan	x
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	x
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	x
Real Estate Disclosure Requirements	
Site Plan Review Requirements	
Stormwater Ordinance	x
Subdivision Regulations	
Watershed Ordinance	

ANNEX B: TOWN OF BALDWIN

COMMUNITY CAPABILITY CHECKLIST	Town of Baldwin
Zoning Ordinance/Land Use Restrictions	x
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	
Public Education/Awareness Programs	
Stream Maintenance Program	x
Storm Drainage Systems Maintenance Program	
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	
Environmental Conservation Specialist	
Floodplain Administrator	x
GIS Specialist	
Personnel with Hazard Knowledge	
Planner	
Public Information Official	
Resource Development/Grant Writer	x

ANNEX C: TOWN OF BIG FLATS

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JURISDICTION PROFILE

OVERVIEW

The Town of Big Flats is located in Chemung County, New York, with a population just under 7,800. The town is on the west border of the county, west of Elmira. It is part of the Elmira Metropolitan Statistical Area. According to the United States Census Bureau, the town has a total area of 45.1 square miles, of which 44.5 square miles is land and 0.6 square miles, or 1.29%, is water. The Chemung River, a tributary of the Susquehanna River, flows through the southern portion of town. Sing Sing Creek flows through the center of the town and is a tributary of the Chemung River. Figure C-1 shows the general location of the Town of Big Flats.

TOWN OF BIG FLATS CONTACT INFORMATION

Name: Ed Fairbrother

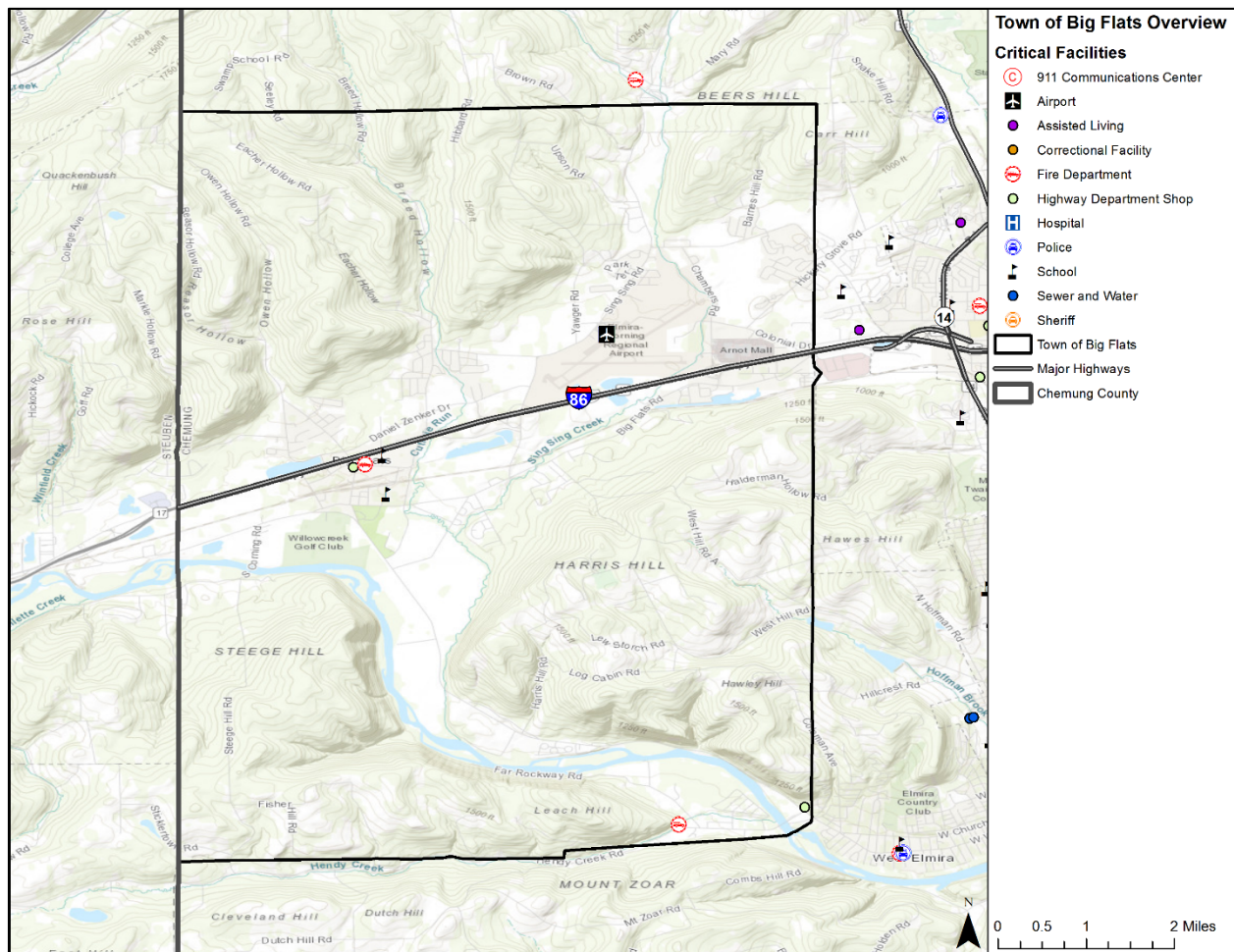
Title: Mayor/Supervisor

Phone: (607)562-8443

Address: 476 Maple Street, Big Flats, NY 14814

Email: townsupervisor@bigflatsny.gov

Figure C-1. Town of Big Flats Planning Area



POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Town of Big Flats had a population of 7,731 residents. Table C-1 provides the population distribution within the Town of Big Flats.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table C-1. Population Distribution for the Town of Big Flats

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Big Flats	7,731	8.7%	134	471

POPULATION GROWTH

The official 2010 Town of Big Flats population is 7,731. Overall, the Town of Big Flats experienced an increase in population between 1980 and 2010 by 1.1%, or an increase of 82 people. Table C-2 provides historic change rates in the Town of Big Flats.

Table C-2. Population for the Town of Big Flats, 1980-2010

JURISDICTION	1980 ²	1990 ³	2000 ⁴	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Town of Big Flats	7,649	7596	7,224	7,731	82	1.1%	507	7.0%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Town of Big Flats might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table C-3, as provided Cornell University's Program on Applied Demographics⁵. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area. It is noted that the Town of Big Flats shows an increase in population since 1980. That trend is anticipated to continue in the future with several new housing developments currently in the planning stage. While the data below is available at the county level only, current trends and team input indicate modest growth for the Town of Big Flats into the foreseeable future.

² https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

³ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁴ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁵ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table C-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

HAZARD DESCRIPTION, LOCATION, EXTENT & HISTORICAL OCCURENCES

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Town of Big Flats, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Town of Big Flats experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Town of Big Flats is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Town of Big Flats are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Town of Big Flats:

Table C-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Big Flats	1 Airport, 2 Fire Stations, 1 Highway Department Shop, 1 Schools

Population over 65 in the Town of Big Flats is estimated at 16.7% of the total population or an estimated total of 1,298⁶ potentially vulnerable residents in the planning area based on age (Table C-5).

Table C-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Town of Big Flats	134

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table C-6 depicts historical occurrences of thunderstorm wind events for the Town of Big Flats according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 11 thunderstorm wind events are known to have impacted the Town of Big Flats, based upon NCEI records. It is noted that there have been no recorded thunderstorm wind events reported prior to 1996 as having impacted the Baylor County Planning Area, based upon NCEI records. It is highly likely multiple thunderstorm wind event occurrences have gone unreported throughout the recording period.

Table C-6. Historical Thunderstorm Wind Events, 1955-2018⁷⁸

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Big Flats	4/30/1996	11:28 AM	Unknown	0	0	\$4,829	\$0
Town of Big Flats	6/16/2000	6:18 PM	52	0	0	\$0	\$0
Town of Big Flats	6/27/2002	2:45 PM	55	0	4	\$69,924	\$0
Town of Big Flats	7/21/2003	3:45 PM	62	0	0	\$41,042	\$0
Town of Big Flats	6/6/2005	11:05 AM	60	0	0	\$64,676	\$0

⁶ US Census Bureau 2016 data for the Town of Big Flats.

⁷ Damages are reported from January 1955 through June 2018.

⁸ Magnitude is listed when available. Damage values are in 2018 dollars.

ANNEX C: TOWN OF BIG FLATS

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Big Flats	6/2/2007	3:25 PM	50	0	0	\$0	\$0
Town of Big Flats	7/8/2007	6:25 PM	50	0	0	\$2,416	\$0
Town of Big Flats	6/25/2009	3:45 PM	50	0	0	\$1,166	\$0
Town of Big Flats	4/27/2011	7:13 PM	50	0	0	\$5,593	\$0
Town of Big Flats	6/24/2013	2:45 PM	50	0	0	\$5,387	\$0
Town of Big Flats	5/3/2018	2:10 PM	55	0	0	\$50,000	\$0
Town of Big Flats Totals				0	4	\$245,033	

Based on the list of historical thunderstorm wind events for the Town of Big Flats, two reported events have occurred since the 2012 Plan.

HAIL

Historical evidence shown in Figure C-2 demonstrates that the Town of Big Flats is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Table C-7 depicts historical occurrences of hail events for the Town of Big Flats according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 3 hail events are known to have impacted the Town of Big Flats, based upon NCEI records. Historical hail events are often provided on a county-wide basis in the NCEI database. It is noted that there have been no recorded hail events reported prior to 2002 as having impacted the Baylor County Planning Area, based upon NCEI records. It is highly likely multiple hail event occurrences have gone unreported throughout the recording period. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

ANNEX C: TOWN OF BIG FLATS

Figure C-2. Historical Hail Events, 1955-2018

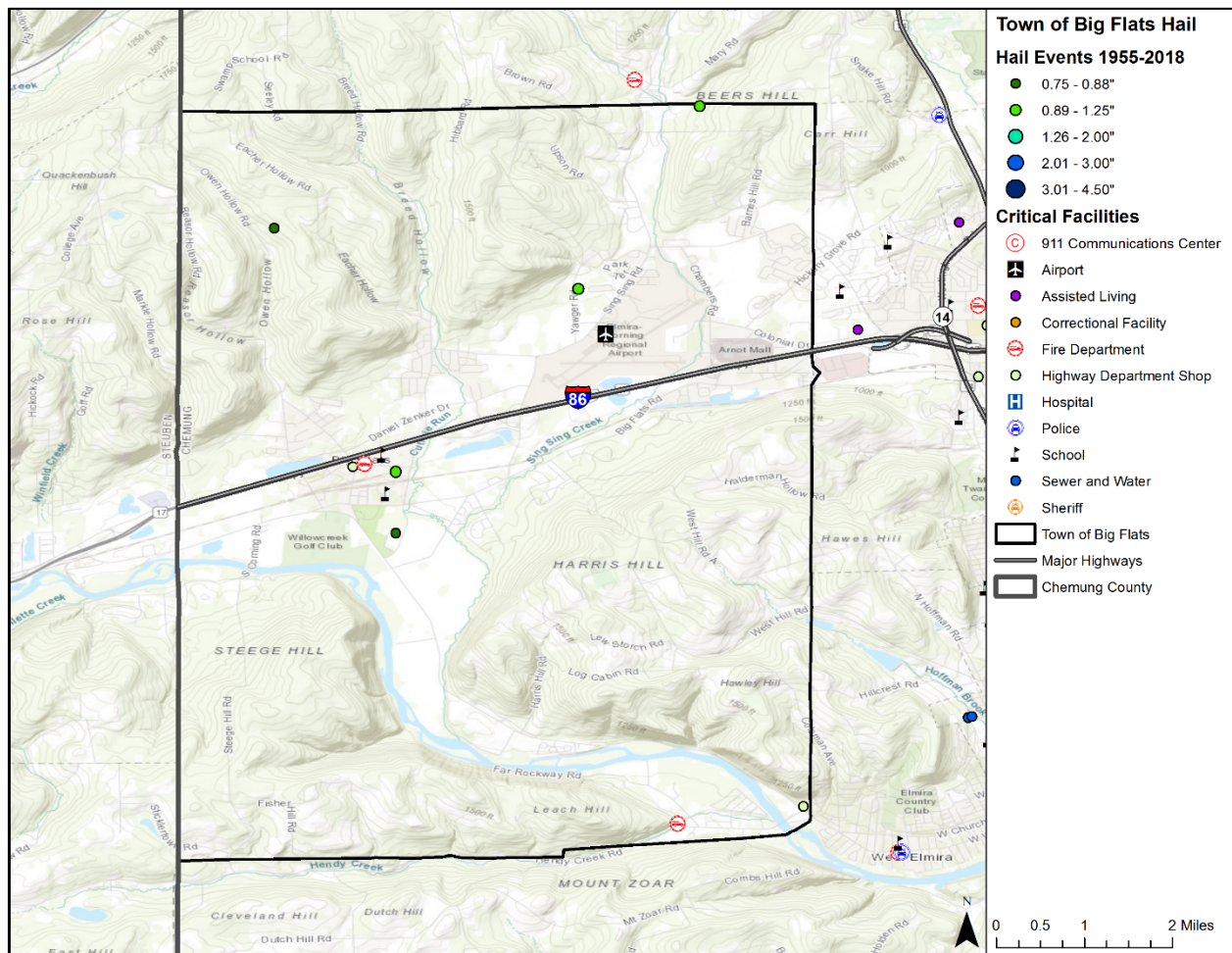


Table C-7. Historical Hail Events, 1955-2018⁹¹⁰

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Big Flats	6/27/2002	2:45 PM	0.88	0	0	\$0	\$0
Town of Big Flats	8/3/2007	1:25 PM	0.75	0	0	\$0	\$0
Town of Big Flats	6/16/2008	2:44 PM	1	0	0	\$0	\$0
Town of Big Flats Totals				0	0	\$0	

⁹ Damages are reported from January 1955 through June 2018.

¹⁰ Magnitude is listed when available. Damage values are in 2018 dollars.

Based on the list of historical hail events for the Town of Big Flats, no reported events have occurred since the 2012 Plan.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there has been one reported historical occurrences of lightning events for the Town of Big Flats (Table C-8). Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

Table C-8. Historical Lightning Events, 1996-2018¹¹

JURISDICTION	DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Big Flats	6/6/2005	11:00 AM	0	0	\$64,676	\$0
Town of Big Flats Totals			0	0	\$64,676	

Based on the list of historical lightning events for the Town of Big Flats, no reported events have occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Big Flats can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Town of Big Flats is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 211 manufactured homes (approximately 6.0%) located in the Town of Big Flats (Table C-9). In addition, 68.3% (approximately 2,386 structures) of the residential structures in the Town of Big Flats were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table C-9. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Big Flats	211	2,386

¹¹ Damages are reported from January 1996 through June 2018. Damage values are in 2018 dollars.

The following critical facilities (Table C-10) would be vulnerable to thunderstorm events in the Town of Big Flats:

Table C-10. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Big Flats	1 Airport, 2 Fire Stations, 1 Highway Department Shop, 1 Schools

Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Big Flats has resulted in four injuries and no fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Big Flats would be “Limited,” with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$309,709 having an approximate annual loss estimate of \$4,877 (Table C-11).

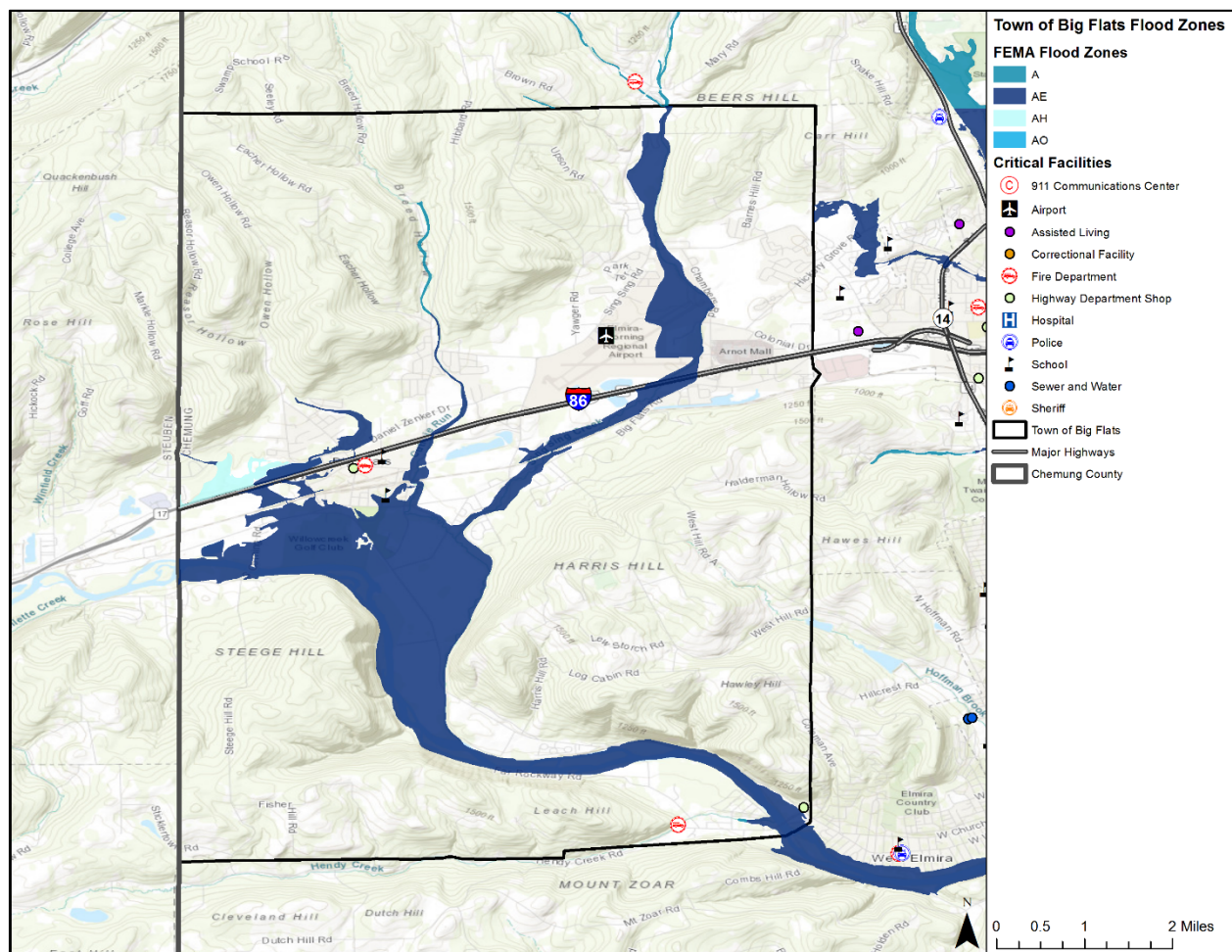
Table C-11. Potential Annualized Losses for the Town of Big Flats

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Big Flats	\$309,709	\$4,877

FLOOD

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. Full flood zone delineations with elevations are available in the Town of Big Flats. The location of estimated flood zones for the Town of Big Flats, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure C-3.

Figure C-3. Estimated Flood Zones in the Town of Big Flats

HISTORICAL OCCURRENCES

Table C-12 depicts historical occurrences of flood events for the Town of Big Flats according to the National Centers for Environmental Information (NCEI) data. From January 1996 to June 2018, 3 flood events were known to have impacted the Town of Big Flats, based upon NCEI records. Flood events are often reported on a county-wide basis, or under-reported for individual municipalities, particularly in small communities such as the Town of Big Flats.

Table C-12. Historical Flood Events, 1996-2018¹²

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Big Flats	6/10/2005	0	0	25,870	\$0

¹² Values are in 2018 dollars. Events reported from January 1996 through June 2018.

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Big Flats	4/25/2011	0	0	11,186	\$0
Town of Big Flats	8/8/2013	0	0	21,515	\$0
Town of Big Flats Totals		0	0	\$58,571	

Based on the list of historical flood events for the Town of Big Flats, one reported event has occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Big Flats can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Town of Big Flats is highly likely.

VULNERABILITY AND IMPACT

Table C-13 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table C-13. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Town of Big Flats	None

Historic loss estimates due to flood are presented in Table C-14 below.

Table C-14. Potential Annualized Losses, 1996-2018¹³

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Big Flats	3	0	0	\$58,571	\$2,603

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table C-15 depicts the level of impact for the Town of Big Flats.

¹³ Events reported from January 1996 through June 2018.

Table C-15 Town of Big Flats Impact

JURISDICTION	IMPACT	DESCRIPTION
Town of Big Flats	Limited	The Town of Big Flats could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Town of Big Flats currently participates in the National Flood Insurance Program as well as the Community Rating System and has in place a flood damage prevention ordinance that includes standards above the minimum FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Town of Big Flats has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Town of Big Flats as a high risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. The Town of Big Flats has a designated floodplain administrator. The Big Flats floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the Town of Big Flats outlines the minimum requirements for development in special flood hazard areas. Table C-16 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table C-16. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Town of Big Flats	05/16/2006	09/19/2012	Good Standing	86

REPETITIVE LOSS

Table C-17 shows repetitive loss and severe repetitive loss properties for the Town of Big Flats.

Table C-17. Repetitive Loss and Severe Repetitive Loss Properties

JURISDICTION	BUILDING TYPE	NUMBER OF STRUCTURES	NUMBER OF LOSSES
Town of Big Flats	Single Family	1	3
Town of Big Flats	2-4 Family	1	2

TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of tornado events for the Town of Big Flats. Historical tornado events are often provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities, such as the Town of Big Flats, are impacted. Tornado events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Town of Big Flats can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Town of Big Flats is likely.

VULNERABILITY AND IMPACT

The U.S. Census data indicates a total of 211 manufactured homes (Table C-18) located in the Town of Big Flats (6.0% of housing units). In addition, 68.3% (approximately 2,386 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table C-18. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Big Flats	211	2,386

The following critical facilities would be vulnerable to tornado events in the Town of Big Flats:

Table C-19. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Big Flats	1 Airport, 2 Fire Stations, 1 Highway Department Shop, 1 Schools

ANNEX C: TOWN OF BIG FLATS

The average loss estimate of property and crop is \$0 (in 2018 dollars), having an approximate annual loss estimate of \$0 (Table C-20). Based on historic loss and damages, the impact of tornado on the Town of Big Flats can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table C-20. Potential Annualized Losses, 1983-2018¹⁴

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Big Flats	\$0	\$0

LANDSLIDE

The Town of Big Flats has no known areas susceptible or prone to landslide (Section 9). The Town of Big Flats has no known historical occurrences of landslide and does not anticipate any landslide events in the future. The municipality determined that this hazard is not a threat to the township and therefore does not require further analysis.

¹⁴ Events recorded from January 1983 through June 2018.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. Stabilization Projects 1. Upson Rd 2. Owen Hollow 3. Monastary Rd 4. Sing Rd 5. Upper Hoffman Brk Also, detention basin project at Jackson Farm.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Projects 1,2,3,4 complete. Jackson Farm is not completed. Action will be included in Plan Update.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Funding not secured. Action will be included in Plan Update.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the Stormwater Coalition and STC for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Changes were made to zoning restrictions for new developments within much of the Chemung River Floodplain. Action will be included in Plan Update.
Flood -15	Additional Floodplain Management Activities	Flood	Municipalities will work with STC, EMO and other agencies to improve CRS credits and increase CRS ratings to provide residents with better rates for NFIP. Code Enf Officer took E-278- NFIP/CRS course at NYS Fire Academy.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Maintained CRS Class 8. Current code enforcement staff have taken floodplain management training. Action will be included in Plan Update.

NEW MITIGATION ACTIONS

Comprehensive Hydrology and Hydraulics (H&H) Studies of Various Watersheds		Town of Big Flats – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	There has been significant construction activity in many portions of Big Flats since the last comprehensive H & H studies were conducted. Additionally, changing weather patterns which are producing more rainfall in shorter, more intensive periods have also likely invalidated studies that are now 10+ years old.		
Action or Project Intended for Implementation			
Description of the Solution	A set of mutually exclusive, but collectively exhaustive, H & H watershed studies that can be seamlessly integrated into a town-wide document. This set of studies will inform development and mitigation efforts, and will be submitted to FEMA for map revisions		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	Updated H & H studies will provide valuable engineering and planning guidance to our Town Leadership. The Planning Board, Code Department and Highway Department will be better equipped to make informed decisions.
Useful Life	10-20 years		
Estimated Cost	\$100-150K		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Fall 2018 – Fall 2019
Estimated Time Required for Project Implementation	9-12 months	Potential Funding Sources	FEMA grant, DEC grant, Town budget
Responsible Organization	Big Flats Public Works Department	Local Planning Mechanisms to be Used in Implementation, if any	None, n/a
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Forces reliance on outdated studies which do not consider latest weather patterns
	Continue to conduct only limited scope drainage studies when new development is proposed	\$20-30K annually	While acceptable in immediate proximity of new construction, will likely miss larger watershed impacts. Cannot be integrated
	Rely on Army COE and/or DEC studies whenever they might be conducted and published	\$25-50K annual costs for recovery work which might be avoided with newer H & H data	Federal/State studies are often subjected to schedule slips/cancellation due to budget concerns. Also, detail is typically less.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Debris Basin for Quail Hollow Development Drainage System			Town of Big Flats - 2
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Loose branches, brush and vegetation mix with drainage water and cause damming and plugged culverts. When this occurs, flood water escapes the existing drainage network, causing significant damage to public and private property. Recovery efforts are time consuming and labor intensive.		
Action or Project Intended for Implementation			
Description of the Solution	Constructing a debris basin and adding to the current stormwater management system will reduce flooding risk in Quail Hollow area since debris will now be captured before it enters and blocks critical elements of the drainage network. Location of the proposed basin will allow easy access for DPW crews to complete periodic cleaning.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	Will prevent significant erosion problems to ditches, road surfaces/shoulders and swales. Recovery work from flooding will be significantly reduced or eliminated.
Useful Life	30 years		
Estimated Cost	\$50K		
Plan for Implementation			
Prioritization	Med - High	Desired Timeframe for Implementation	Spring – Summer 2019
Estimated Time Required for Project Implementation	3 – 6 months	Potential Funding Sources	FEMA grant, DEC grant, Town budget
Responsible Organization	BF DPW	Local Planning Mechanisms to be Used in Implementation, if any	BF Building Codes
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Current drainage system susceptible to debris, failure during heavy storm events
	More frequent inspections and increased periodic maintenance	Recurring monthly labor and equipment costs estimated at \$2K/month	Labor intensive and costly approach which may not fully be effective since one heavy storm can create large amounts of debris
	Upstream stabilization project	\$700-800K+	Effective but expensive option due to limited access in area with mostly private property. Lengthy engineering and permit process could delay implementation.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Schweizer Levy System Upgrade / Dike Reinforcement / Outlet Channel Repair		Town of Big Flats - 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Dike surrounds the former Schweizer aircraft plant and is designed to prevent flooding of the plant during a 100-year/24-hour storm event. A diesel engine driven pump handles internal drainage water through the dike and outlet channel to the nearby Sing Sing creek. System operational status must be maintained. During storm events Sing Sing creek rises and threatens the former Schweizer aircraft plant. The current flood control project with installed dike and pump are effective mitigation measures however animal burrows have weakened the dike. Corroded structures need paint. Additionally, the outlet structure needs rip-rap relining.		
Action or Project Intended for Implementation			
Description of the Solution	Contract with appropriate firm to eliminate burrowing animal(s), then fill holes to prevent return. Add additional rip rap material to outlet structure for stabilization where needed. Remove trees/brush/weeds along dike. Complete preventative maintenance painting of corroded structures and repair gate valve to full functionality.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	Prompt action to eliminate the animal burrows and reline the outlet structure will prevent more costly repairs in the future. Repair of gate valve will insure full functionality if/when needed during a major storm event.
Useful Life	100 years (installed in 1986)		
Estimated Cost	\$15-30K		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Fall 2018
Estimated Time Required for Project Implementation	2-4 weeks	Potential Funding Sources	FEMA grant, DEC grant, Town budget
Responsible Organization	Town of Big Flats DPW. (need to obtain approval from USDA Soil Conservation Service before starting any work)	Local Planning Mechanisms to be Used in Implementation, if any	Building code, Nuisance animal ordinances (if applicable)
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	System will likely fail within next decade
	Perform only minimum maintenance like mowing, painting, oil changes.	\$2-3K annually	Skipping major maintenance saves money near term but will shorten life of system
	Pave dikes to prevent vegetation growth, line outlet channel with concrete to stop erosion	\$100K	Costly but efficient solution which reduces annual mowing and outlet channel repair costs.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Town Hall Basement Flood Water Mitigation		Town of Big Flats – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Flooding in finished basement during heavy rains and snow melts. Current sump system pumps water to outside retention pond and works satisfactorily except during heavy rains when retention pond fills to capacity. At those times, back pressure in building drain line prevents water flow from basement, causing drains to back up and basement to flood. Aug 2018 flooding led to 3-6-inch levels.		
Action or Project Intended for Implementation			
Description of the Solution	Plan is to connect outside retention pond to nearby Canal street storm sewer so pond level can be maintained below critical height during use.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	Complete protection is anticipated	Estimated Benefits (losses avoided)	Town Hall basement flooring, sheetrock, furniture and contents will be better protected. Aug 2018 flooding caused an estimated \$25K damage and forced relocation of personnel and stored records.
Useful Life	Permanent (50+ yrs.)		
Estimated Cost	\$25-30K		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Fall 2018 or Spring 2019
Estimated Time Required for Project Implementation	2-4 months	Potential Funding Sources	FEMA grant, Town budget
Responsible Organization	BF DPW	Local Planning Mechanisms to be Used in Implementation, if any	Town Building Codes
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insufficient protection w/current system
	Rent/install temporary pumps during storms. Create overtime schedule for DPW work crews to man	\$15-20K annually, assuming 2-3 events, each requiring 5-7 days manpower/pump rental	Only pumps water to parking lot; noisy and hoses/wires to trip over; requires manpower since building insecure
	Abandon basement space and construct new building or secure leased space in local area	\$150-200K new construction or \$3K monthly lease for office space	Loss of 2,500 sq. ft of usable basement offices require viable alternative to current temporary space "sharing" arrangement
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Town of Big Flats – 5
Risk/Vulnerability		
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm	
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.	
Action or Project Intended for Implementation		
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.	

Is this Project related to a Critical Facility?

Yes No ☒ X

Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Big Flats	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$5,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Stream Stabilization Program		Town of Big Flats – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Extreme rainfall events result in high stormwater flow rates, which result in the destabilization of stream channels (including streambanks), that causes erosion and deposition within these streams, as well as stream migration. The erosion of streambanks and migration of stream channels can jeopardize adjacent buildings, bridges, culverts, roadways, utilities, and other infrastructure.		
Action or Project Intended for Implementation			
Description of the Solution	The Chemung County Soil & Water District has a current program to stabilize streams and streambanks. This program will be expanded and implemented, to correct destabilized and migrated streams that pose risks to existing infrastructure. Continue work on Jackson Farm.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year Storm Event (min.)	Estimated Benefits (losses avoided)	Expansion and implementation of this program would result in prompt repairs to destabilized streams; improved protection for adjacent infrastructure; improved safety for motorists; and reduced sediment reaching waterbodies.
Useful Life	50 years		
Estimated Cost	Dependent upon stream and extent of damage		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Town of Big Flats	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Install retention/detention ponds to reduce impact to streams during heavy rain events.	Dependent on size, location and number of ponds required to lessen stream impacts	Less cost beneficial; Potential environmental impacts
	Proposed action	Dependent upon stream and extent of damage	Considered the best alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Buyout Damaged Properties		Town of Big Flats - 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Homes have sustained repetitive flood losses. The Town of Big Flats has offered to assist the occupants with the buyout process. Will need to secure grant funding to proceed.		
Action or Project Intended for Implementation			
Description of the Solution	Buyout homes in the highest risk floodplain areas in order to relocate residents to safer locations, permanently eliminate the risk of repetitive damage to homes, and restore natural floodplain functions. The Town of Big Flats will identify willing sellers, pursue grant funding, and assist with the buyout process.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	100-year storm event	Estimated Benefits (losses avoided)	Reduce the damage to residential property and the disruption to life caused by repeated flooding.
Useful Life	100 years		
Estimated Cost	>\$1,000,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Big Flats	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Continuing repetitive losses; Residents remain in harm's way; Emergency services required in high risk areas
	Relocate homes	>\$2,000,000	Less cost effective; Less feasible option due to age of structures
	Proposed Action	>\$1,000,000 (Depending on the number of willing participants)	Cost effective alternative; No residual risk
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Floodplain Management		Town of Big Flats – 8	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Improve CRS Ratings		Town of Big Flats – 9	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Municipalities will work with STC, EMO and other agencies to improve CRS credits and increase CRS ratings to provide residents with better rates for NFIP.		
Action or Project Intended for Implementation			
Description of the Solution	The Town of Big Flats maintained CRS Class 8. Current code enforcement staff have taken floodplain management training which helps with ratings. Project is ongoing to identify additional activities that will help the community improve ratings.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Attaining this goal would ensure better NFIP rates for residents.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$10,000	Cost effective but provides no financial relief to residents
	Proposed project	Staff time	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		Town of Big Flats – 10	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Big Flats Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Big Flats	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	Town of Big Flats
Capital Improvements Plan	x
Master or Comprehensive Plan	x
Community Wildfire Protection Plan	
Continuity of Operations	
Economic Development Plan	
Emergency Operations Plan	
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	x
Open Space Plan	x
Post-disaster Recovery Plan	
Redevelopment Plan	x
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	x
Real Estate Disclosure Requirements	
Site Plan Review Requirements	x
Stormwater Ordinance	x
Subdivision Regulations	x
Watershed Ordinance	

ANNEX C: TOWN OF BIG FLATS

COMMUNITY CAPABILITY CHECKLIST	Town of Big Flats
Zoning Ordinance/Land Use Restrictions	x
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	x
Property Acquisition Program	x
Public Education/Awareness Programs	x
Stream Maintenance Program	
Storm Drainage Systems Maintenance Program	
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	
Environmental Conservation Specialist	
Floodplain Administrator	x
GIS Specialist	x
Personnel with Hazard Knowledge	x
Planner	x
Public Information Official	x
Resource Development/Grant Writer	x

ANNEX D: TOWN OF CATLIN

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JURISDICTION PROFILE

OVERVIEW

The Town of Catlin is located in Chemung County, New York, with a population just under 2,700. The town is named after Phineas Catlin, a surveyor and public official. Catlin is in the northwest corner of the county, northwest of Elmira. It is part of the Elmira Metropolitan Statistical Area. The town's land was first settled around 1816. The town of Catlin was organized in 1823. Catlin is bounded on the north by Schuyler County and on the west by Steuben County. According to the United States Census Bureau, the town has a total area of 38.0 square miles, of which 37.7 square miles is land and 0.03 square miles, or 0.07%, is water. Figure D-1 shows the general location of the Town of Catlin.

TOWN OF CATIN CONTACT INFORMATION

Name: Laverne Phelps

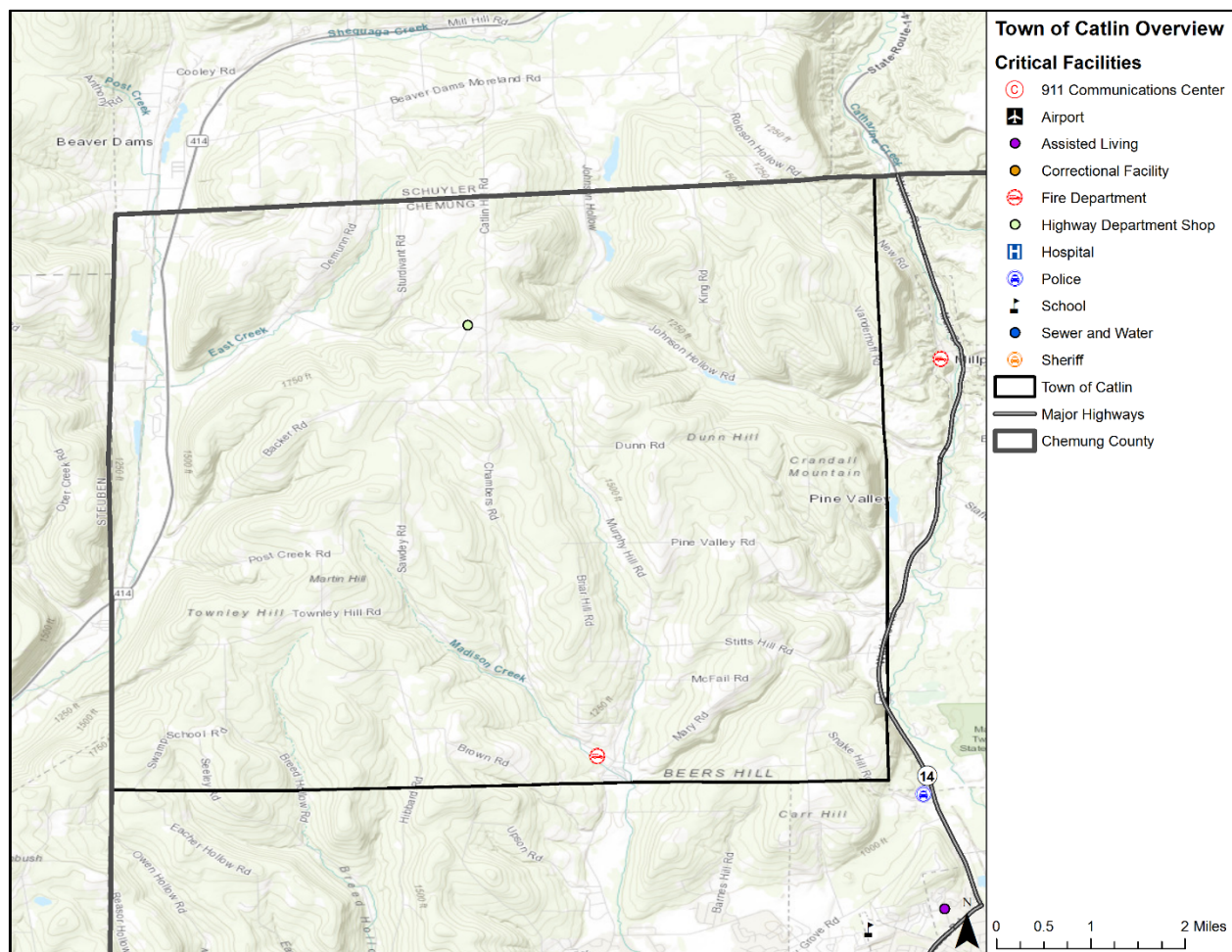
Title: Mayor/Supervisor

Phone: (607)739-5598

Address: 1448 Chambers Road, Beaver Dams,
NY 14812

Email: catlinsupervisor@gmail.com

Figure D - 1. Town of Catlin Planning Area



POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Town of Catlin had a population of 2,618 residents. Table D-1 provides the population distribution within the Town of Catlin.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table D-1. Population Distribution for the Town of Catlin

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Catlin	2,618	2.9%	70	280

POPULATION GROWTH

The official 2010 Town of Catlin population is 2,618. Overall, the Town of Catlin experienced a decrease in population between 1980 and 2010 by 3.7%, or a decrease by 101 people. Table D-2 provides historic change rates in the Town of Catlin.

Table D-2. Population for the Town of Catlin, 1980-2010

JURISDICTION	1980 ²	1990 ³	2000 ⁴	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Town of Catlin	2,719	2,626	2,649	2,618	-101	-3.7%	-31	-1.2%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Town of Catlin might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table D-3, as provided Cornell University's Program on Applied Demographics⁵. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

³ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁴ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁵ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table D-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

HAZARD DESCRIPTION, LOCATION, EXTENT & HISTORICAL OCCURENCES

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Town of Catlin, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Town of Catlin experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Town of Catlin is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Town of Catlin are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Town of Catlin:

Table D-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Catlin	1 Fire Station, 1 Highway Department Shop

Population over 65 in the Town of Catlin is estimated at 9.6% of the total population or an estimated total of 250⁶ potentially vulnerable residents in the planning area based on age (Table D-5).

⁶ US Census Bureau 2016 data for the Town of Catlin.

Table D-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Town of Catlin	250

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table D-6 depicts historical occurrences of thunderstorm wind events for the Town of Catlin according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 3 thunderstorm wind events are known to have impacted the Town of Catlin, based upon NCEI records.

Table D-6. Historical Thunderstorm Wind Events, 1955-2018⁷⁸

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Catlin	7/15/1994	5:20 PM	0	0	0	\$8,477	\$0
Town of Catlin	7/6/1995	1:45 PM	0	0	0	\$3,300	\$0
Town of Catlin	6/25/2009	3:45 PM	50	0	0	\$3,499	\$0
Town of Catlin Totals				0	0	\$15,275	

Based on the list of historical thunderstorm wind events for the Town of Catlin, no reported events have occurred since the 2012 Plan.

HAIL

Historical evidence shown in Figure D-2 demonstrates that the Town of Catlin is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Table D-7 depicts historical occurrences of hail events for the Town of Catlin according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 2 hail events are known to have impacted the Town of Catlin, based upon NCEI records. Historical hail events are often provided on a county-wide basis in the NCEI database.

⁷ Damages are reported from January 1955 through June 2018.

⁸ Magnitude is listed when available. Damage values are in 2018 dollars.

ANNEX D: TOWN OF CATLIN

Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

Figure D-2. Historical Hail Events, 1955-2018

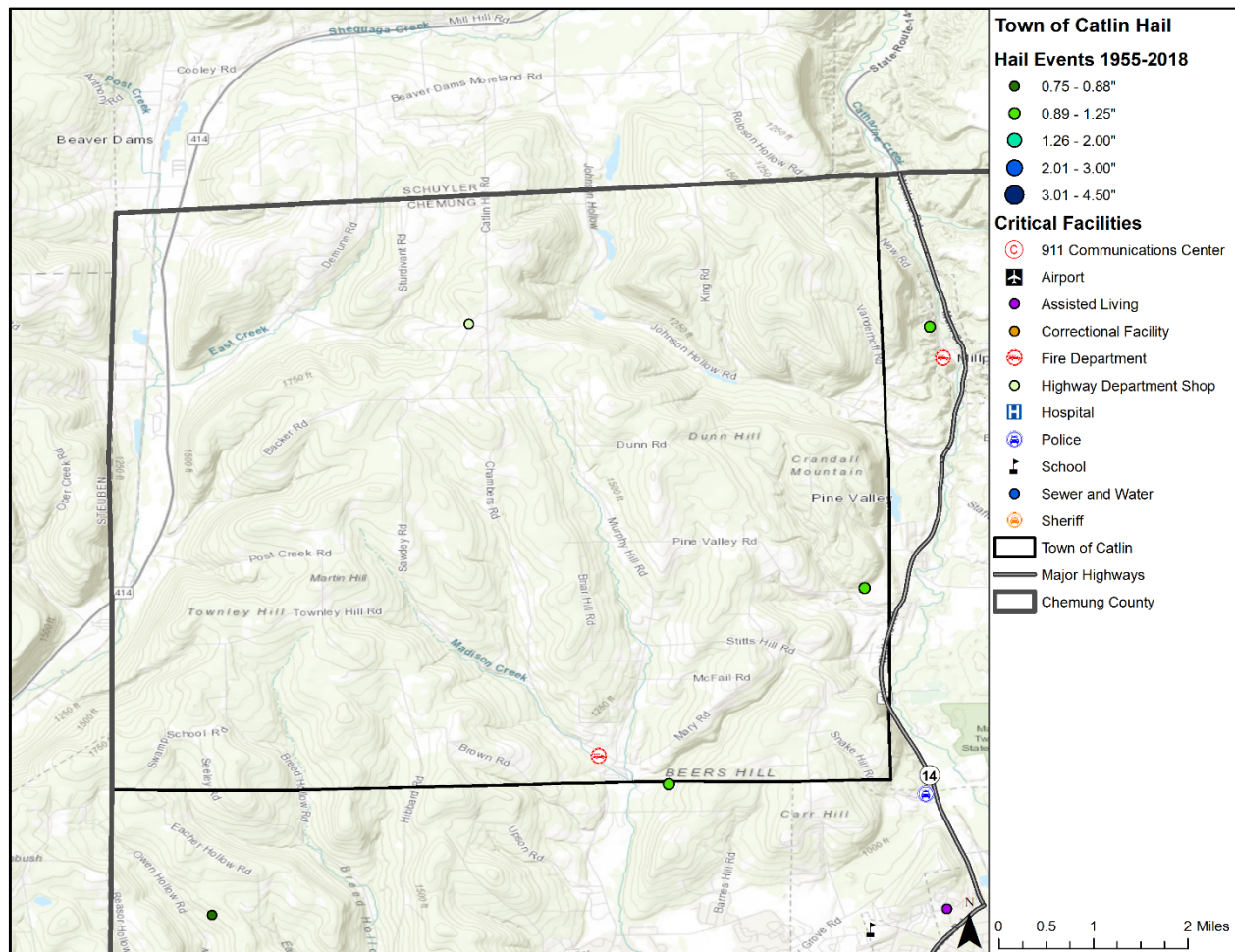


Table D-7. Historical Hail Events, 1955-2018⁹¹⁰

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Catlin	5/10/2000	11:15 AM	1.0	0	0	\$0	\$0
Town of Catlin	9/6/2012	3:13 PM	1.0	0	0	\$0	\$0
Town of Catlin Totals				0	0	\$0	

⁹ Damages are reported from January 1955 through June 2018.

¹⁰ Magnitude is listed when available. Damage values are in 2018 dollars.

Based on the list of historical hail events for the Town of Catlin, one reported event has occurred since the 2012 Plan.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the Town of Catlin. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Catlin can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Town of Catlin is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 244 manufactured homes (approximately 23.5%) located in the Town of Catlin (Table D-8). In addition, 59.8% (approximately 622 structures) of the residential structures in the Town of Catlin were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table D-8. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Catlin	244	622

The following critical facilities (Table D-9) would be vulnerable to thunderstorm events in the Town of Catlin:

Table D-9. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Catlin	1 Fire Station, 1 Highway Department Shop

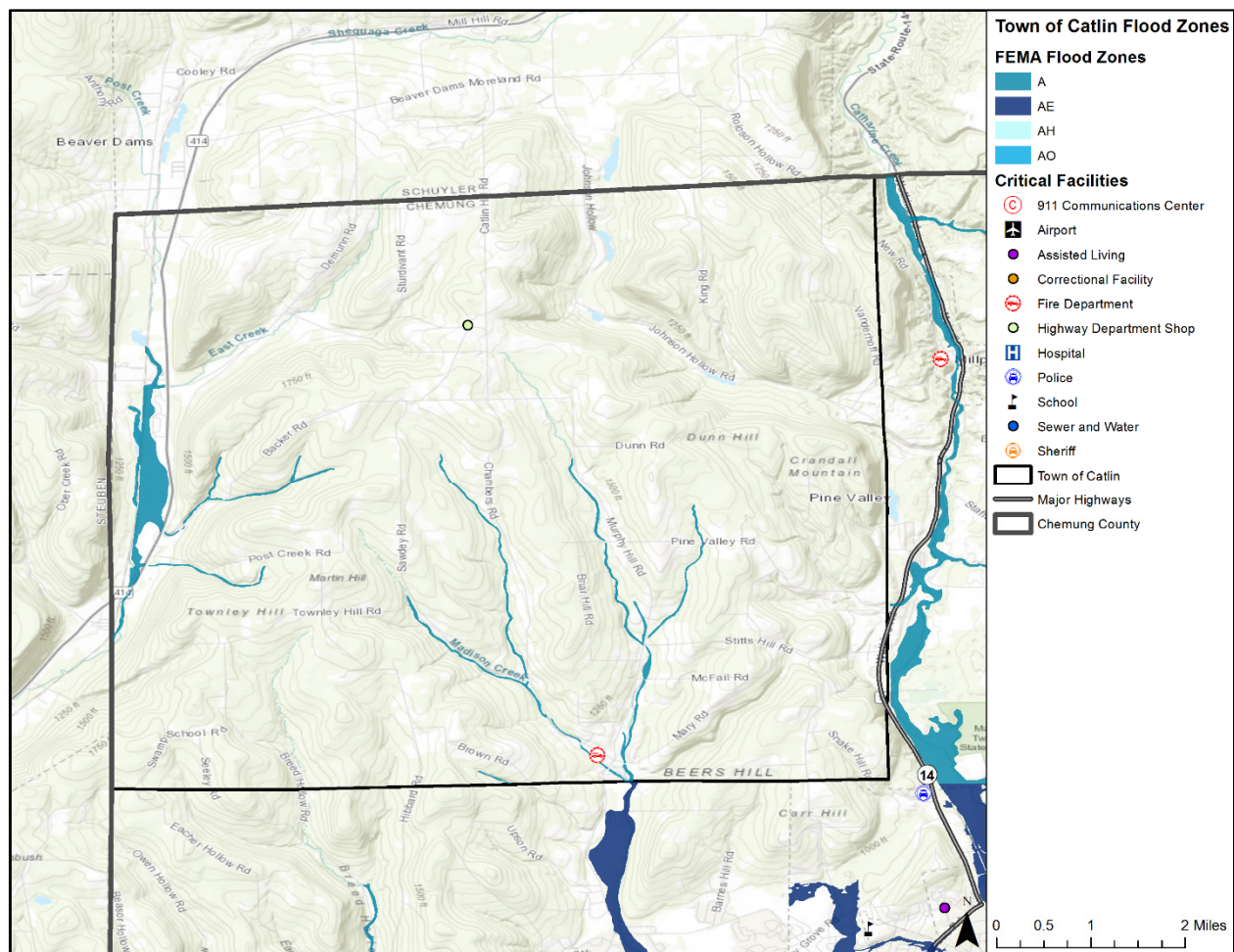
Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Catlin has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Catlin would be "Limited," with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$15,275 having an approximate annual loss estimate of \$241 (Table D-10).

Table D-10. Potential Annualized Losses for the Town of Catlin

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Catlin	\$15,275	\$241

FLOOD**HAZARD DESCRIPTION, LOCATION AND EXTENT**

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. A limited flood hazard boundary map with no elevations is available in the Town of Catlin. The location of estimated flood zones for the Town of Catlin, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure D-3.

Figure D-3. Estimated Flood Zones in the Town of Catlin

HISTORICAL OCCURRENCES

Table D-11 depicts historical occurrences of flood events for the Town of Catlin according to the National Centers for Environmental Information (NCEI) data. From January 1996 to June 2018, 2 flood events were known to have impacted the Town of Catlin, based upon NCEI records. Flood events are often reported on a county-wide basis, or under-reported for individual municipalities, particularly in small communities such as the Town of Catlin.

Table D-11. Historical Flood Events, 1996-2018¹¹

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Catlin	8/8/2013	0	0	161,359	\$0
Town of Catlin	8/8/2013	0	0	80,680	\$0
Town of Catlin Totals		0	0	\$242,039	

Based on the list of historical flood events for the Town of Catlin, both reported events have occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Catlin can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Town of Catlin is highly likely.

VULNERABILITY AND IMPACT

Table D-12 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table D-12. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Town of Catlin	None

Historic loss estimates due to flood are presented in Table D-13 below.

¹¹ Values are in 2018 dollars. Events reported from January 1996 through June 2018.

Table D-13. Potential Annualized Losses, 1996-2018¹²

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Catlin	2	0	0	\$242,039	\$11,002

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table D-14 depicts the level of impact for the Town of Catlin.

Table D-14 Town of Catlin Impact

JURISDICTION	IMPACT	DESCRIPTION
Town of Catlin	Limited	The Town of Catlin could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Town of Catlin currently participates in the National Flood Insurance Program as well as the Community Rating System and has in place a flood damage prevention ordinance that includes standards above the minimum FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Town of Catlin has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Town of Catlin as a low risk hazard during hazard ranking activities at the Risk Assessment Workshop. Many of the mitigation actions were developed with flood mitigation in mind. The Town of Catlin has a designated floodplain administrator. The Catlin floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the Town of Catlin outlines the minimum requirements for development in special flood hazard areas. Table D-15 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table D-15. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Town of Catlin	Unknown	06/18/2012	Good Standing	6

¹² Events reported from January 1996 through June 2018.

REPETITIVE LOSS

Table D-16 shows repetitive loss and severe repetitive loss properties for the Town of Catlin.

Table D-16. Repetitive Loss and Severe Repetitive Loss Properties

JURISDICTION	BUILDING TYPE	NUMBER OF STRUCTURES	NUMBER OF LOSSES
Town of Catlin	Single Family	1	2

TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of tornado events for the Town of Catlin. Historical tornado events are often provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities, such as the Town of Catlin, are impacted. Tornado events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Town of Catlin can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Town of Catlin is likely.

VULNERABILITY AND IMPACT

The U.S. Census data indicates a total of 244 manufactured homes (Table D-17) located in the Town of Catlin (23.5% of housing units). In addition, 59.8% (approximately 622 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table D-17. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Catlin	244	622

The following critical facilities would be vulnerable to tornado events in the Town of Catlin:

Table D-18. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Catlin	1 Fire Station, 1 Highway Department Shop

The average loss estimate of property and crop is \$0 (in 2018 dollars), having an approximate annual loss estimate of \$0 (Table D-19). Based on historic loss and damages, the impact of tornado on the Town of Catlin can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table D-19. Potential Annualized Losses, 1983-2018¹³

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Catlin	\$0	\$0

LANDSLIDE

The Town of Catlin has no known areas susceptible or prone to landslide (Section 9). The Town of Catlin has no known historical occurrences of landslide and does not anticipate any landslide events in the future. The municipality determined that this hazard is not a threat to the township and therefore does not require further analysis.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Post Creek from Schuyler line to Steuben line 2. Backer Rd Rt. 414 upstream 2000 feet.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project 2 is complete. Project 1 is unnecessary. Action will be deleted.
Flood-11a	Improve Drainage System	Flood	Upgrade all dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project is partially completed. Action will be included in Plan Update.

¹³ Events recorded from January 1983 through June 2018.

NEW MITIGATION ACTIONS

Catlin Highway Shop Generator		Town of Catlin – 1	
Risk/Vulnerability			
Hazard of Concern	Thunderstorm, Winter Storm, Tornado		
Description of the Problem	During severe weather conditions the Town Highway shop, due to its location and position on the NYSEG Grid, often loses power for lengthy periods of time. This essentially shuts down operations in the building. Heat, lighting, communications, vehicle maintenance, vehicle entry doors are all electricity dependent		
Action or Project Intended for Implementation			
Description of the Solution	Install an emergency generator to keep the Highway shop in operation.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	HIGH	Estimated Benefits (losses avoided)	Allows Town of Catlin Highway shop to remain operational during severe weather events, when Highway services are in greatest need and demand.
Useful Life	25-30 yrs.		
Estimated Cost	\$200,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding; possible bond, loan or tax increase to cover local share.
Responsible Organization	Town of Catlin	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make Shop generator ready	\$100,000	Would still require Town to request a generator through County Emergency Management and wait for delivery
	Secure agreement with another town or County to work out of their shop.	\$2500 per occurrence	Would take extra time and mileage to work from remote location, and additional costs associated with contracting equipment maintenance.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Dunn Road Stormwater Detention & Debris Basin Project			Town of Catlin – 2
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	During intense rainfall events, run-off from the Dunn Rd area runs downhill eroding ground and washing out trees and other debris. A stormwater detention/debris basin would attenuate peak flow rates, allow erosion sediment settle out, and allow trees and other debris to be deposited in a controlled area instead of being washed down into culverts and creeks/streams.		
Action or Project Intended for Implementation			
Description of the Solution	Design and construction of a stormwater detention & debris basin		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	Up to 10-year storm event	Estimated Benefits (losses avoided)	Would reduce peak stormwater flows, mitigate erosion of soil and trees, to alleviate clogging creeks, streams and culverts, pipes during severe weather events and high flow conditions.
Useful Life	75 yrs.		
Estimated Cost	\$200,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding- NYSDEC Water Quality Improvement Projects and / or Hazard Mitigation Grants
Responsible Organization	Town of Catlin	Local Planning Mechanisms to be Used in Implementation, if any	As opportunity presents with land owners
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Reduce flood damages; Increase drainage capacity
	Complete stream stabilization- top to bottom stabilization project.	\$600,000	Would still have debris and some erosion effects requiring continued emergency response/maintenance.
	Concrete Conveyance system	\$1 million	Would be cost prohibitive, would destroy natural habitat and unlikely to be approved by DEC.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Town of Catlin – 3	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Catlin	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$5,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Dirt Road Upgrades		Town of Catlin - 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excessive rain causes dirt roads to turn into mud soup and can cause ditches to overflow. Road improvements are needed.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year	Estimated Benefits (losses avoided)	Improved hydraulic capacity; Reduction in sediment build-up issues; Improved reliability for roadway; Improved safety for motorists; Improved aquatic habitat of stream
Useful Life	50 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources
Responsible Organization	Town of Catlin	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	\$150,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		Town of Catlin – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Catlin Flood Insurance Rate Maps were developed from a limited flood study and currently have no base flood elevations. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Catlin	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	TOWN OF CATLIN
Capital Improvements Plan	
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	x
Economic Development Plan	
Emergency Operations Plan	x
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	
Real Estate Disclosure Requirements	
Site Plan Review Requirements	x
Stormwater Ordinance	x
Subdivision Regulations	x
Watershed Ordinance	

COMMUNITY CAPABILITY CHECKLIST	TOWN OF CATLIN
Zoning Ordinance/Land Use Restrictions	x
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	
Public Education/Awareness Programs	x
Stream Maintenance Program	
Storm Drainage Systems Maintenance Program	
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	x
Environmental Conservation Specialist	x
Floodplain Administrator	x
GIS Specialist	x
Personnel with Hazard Knowledge	x
Planner	x
Public Information Official	x
Resource Development/Grant Writer	

ANNEX E: TOWN OF CHEMUNG

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JURISDICTION PROFILE

OVERVIEW

The Town of Chemung is located in Chemung County, New York, with a population just under 2,600. The town name is derived from the Chemung River, which means "Big Horn" in the native language. The town is in the southeast corner of the county and is southeast of Elmira. It is part of the Elmira Metropolitan Statistical Area. According to the United States Census Bureau, the town has a total area of 50.0 square miles, of which 49.5 square miles is land and 0.5 square miles, or 1.12%, is water. The Chemung River, a tributary of the Susquehanna River, flows through the south part of town. The south town line of Chemung is the border of Pennsylvania. Figure E-1 shows the general location of the Town of Chemung.

TOWN OF CHEMUNG CONTACT INFORMATION

Name: George Richter

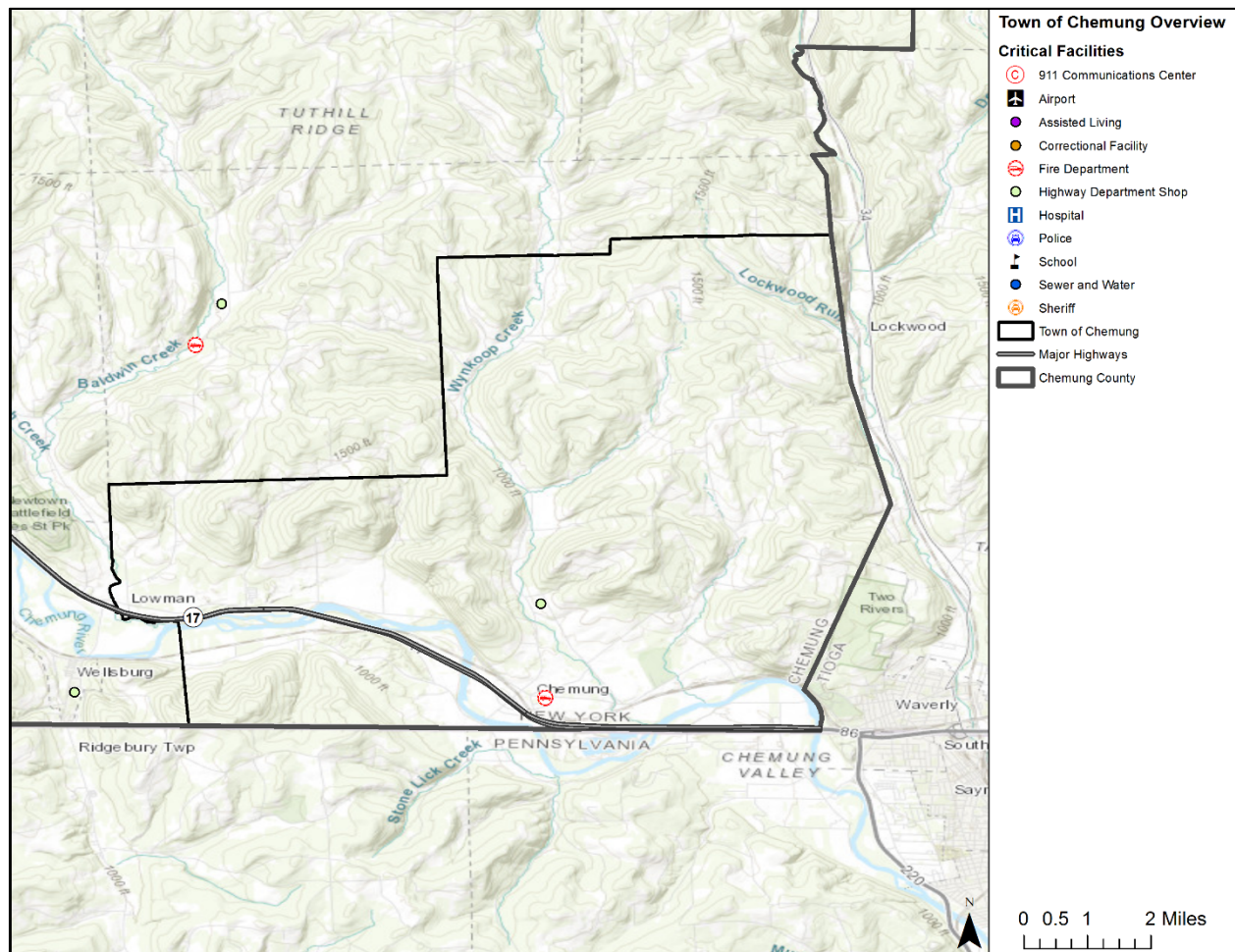
Title: Mayor/Supervisor

Phone: (607)529-3532

Address: 48 Rotary Road, Chemung, NY 14825

Email: supervisor@townofchemung.com

Figure E-1. Town of Chemung Planning Area



POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Town of Chemung had a population of 2,563 residents. Table E-1 provides the population distribution within the Town of Chemung.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table E-1. Population Distribution for the Town of Chemung

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Chemung	2,563	2.9%	134	268

POPULATION GROWTH

The official 2010 Town of Chemung population is 2,563. Overall, the Town of Chemung experienced an increase in population between 1980 and 2010 by 5.2%, or an increase of 127 people. Table E-2 provides historic change rates in the Town of Chemung.

Table E-2. Population for the Town of Chemung, 1980-2010

JURISDICTION	1980 ²	1990 ³	2000 ⁴	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Town of Chemung	2,436	2,540	2,665	2,563	127	5.2%	-102	-3.8%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Town of Chemung might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table E-3, as provided Cornell University's Program on Applied Demographics⁵. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

³ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁴ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁵ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table E-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

HAZARD DESCRIPTION, LOCATION, EXTENT & HISTORICAL OCCURENCES

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Town of Chemung, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Town of Chemung experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Town of Chemung is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Town of Chemung are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Town of Chemung:

Table E-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Chemung	1 Fire Station, 1 Highway Department Shop

Population over 65 in the Town of Chemung is estimated at 16.2% of the total population or an estimated total of 399⁶ potentially vulnerable residents in the planning area based on age (Table E-5).

⁶ US Census Bureau 2016 data for the Town of Chemung.

Table E-5 Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Town of Chemung	399

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table E-6 depicts historical occurrences of thunderstorm wind events for the Town of Chemung according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 6 thunderstorm wind events are known to have impacted the Town of Chemung, based upon NCEI records.

Table E-6. Historical Thunderstorm Wind Events, 1955-2018⁷⁸

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Chemung	6/2/2000	1:30 PM	52	0	1	\$0	\$0
Town of Chemung	10/4/2000	9:07 AM	60	0	0	\$0	\$0
Town of Chemung	6/12/2007	7:35 PM	50	0	0	\$0	\$0
Town of Chemung	8/17/2007	7:00 PM	50	0	0	\$1,210	\$0
Town of Chemung	8/19/2011	1:50 PM	50	0	0	\$3,332	\$0
Town of Chemung	5/16/2009	3:50 PM	70	0	0	\$23,529	\$0
Town of Chemung Totals				0	1	\$28,070	

Based on the list of historical thunderstorm wind events for the Town of Chemung, none of the reported events have occurred since the 2012 Plan.

⁷ Damages are reported from January 1955 through June 2018.

⁸ Magnitude is listed when available. Damage values are in 2018 dollars.

HAIL

Historical evidence shown in Figure E-2 demonstrates that the Town of Chemung is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Table E-7 depicts historical occurrences of hail events for the Town of Chemung according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 3 hail events are known to have impacted the Town of Chemung, based upon NCEI records. Historical hail events are often provided on a county-wide basis in the NCEI database. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

Figure E-2. Historical Hail Events, 1955-2018

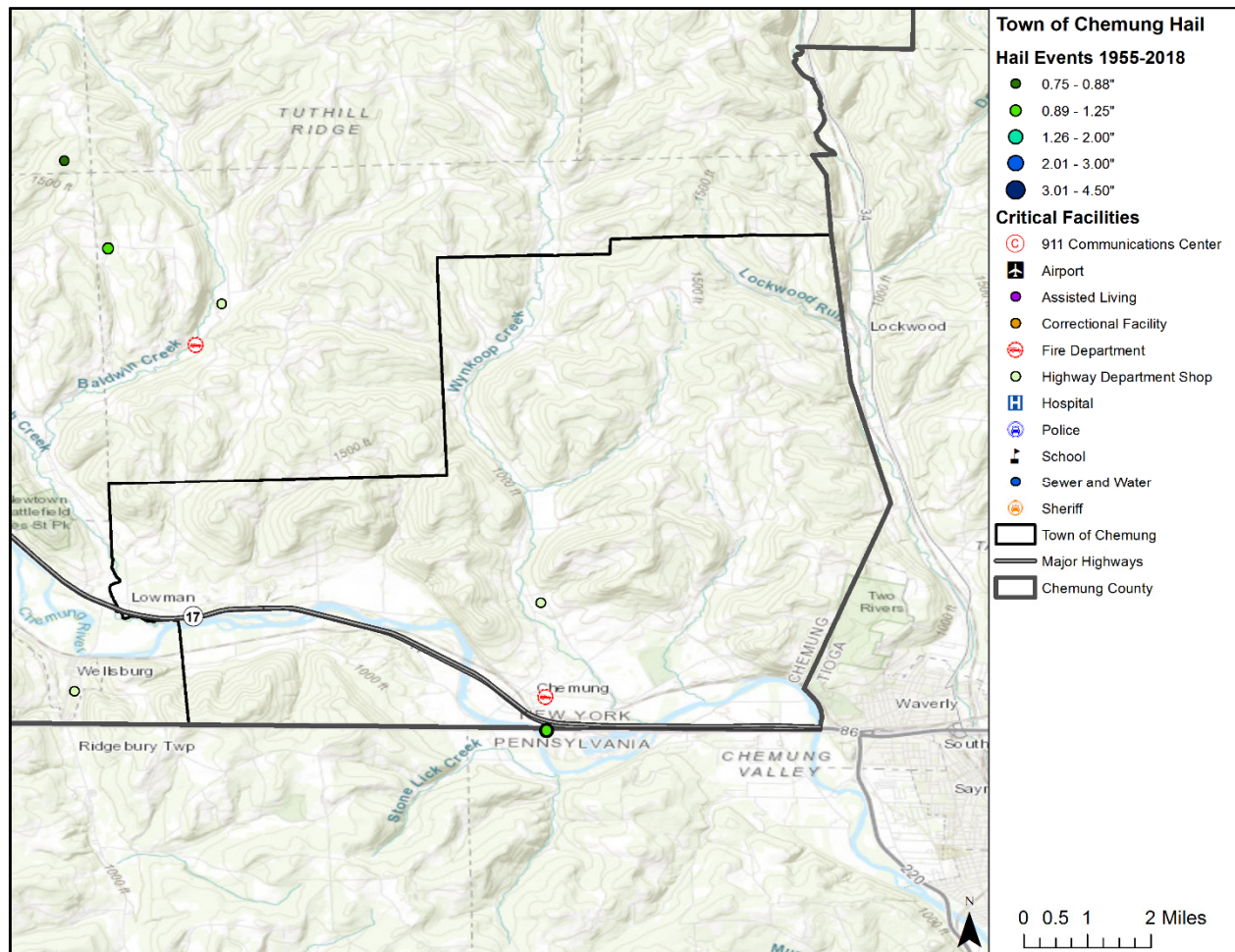


Table E-7. Historical Hail Events, 1955-2018⁹¹⁰

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Chemung	6/22/1996	12:30 PM	1.75	0	0	\$0	\$0
Town of Chemung	7/26/2008	5:02 PM	1.0	0	0	\$0	\$0
Town of Chemung	9/6/2012	4:05 PM	1.0	0	0	\$0	\$0
Town of Chemung Totals				0	0	\$0	

Based on the list of historical hail events for the Town of Chemung, one reported event has occurred since the 2012 Plan.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there has been one reported historical occurrences of lightning events for the Town of Chemung (Table E-8). Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

Table E-8. Historical Lightning Events, 1996-2018¹¹

JURISDICTION	DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Chemung	9/4/2001	8:08 AM	0	1	\$0	\$0
Town of Chemung Totals			0	1	\$0	

Based on the list of historical lightning events for the Town of Chemung, no reported events have occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Chemung can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Town of Chemung is highly likely.

⁹ Damages are reported from January 1955 through June 2018.

¹⁰ Magnitude is listed when available. Damage values are in 2018 dollars.

¹¹ Damages are reported from January 1996 through June 2018. Damage values are in 2018 dollars.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 223 manufactured homes (approximately 20.5%) located in the Town of Chemung (Table E-9). In addition, 67.5% (approximately 736 structures) of the residential structures in the Town of Chemung were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table E-9. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Chemung	223	736

The following critical facilities (Table E-10) would be vulnerable to thunderstorm events in the Town of Chemung:

Table E-10. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Chemung	1 Fire Station, 1 Highway Department Shop

Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Chemung has resulted in two injuries and no fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Chemung would be "Limited," with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$28,070 having an approximate annual loss estimate of \$446 (Table E-11).

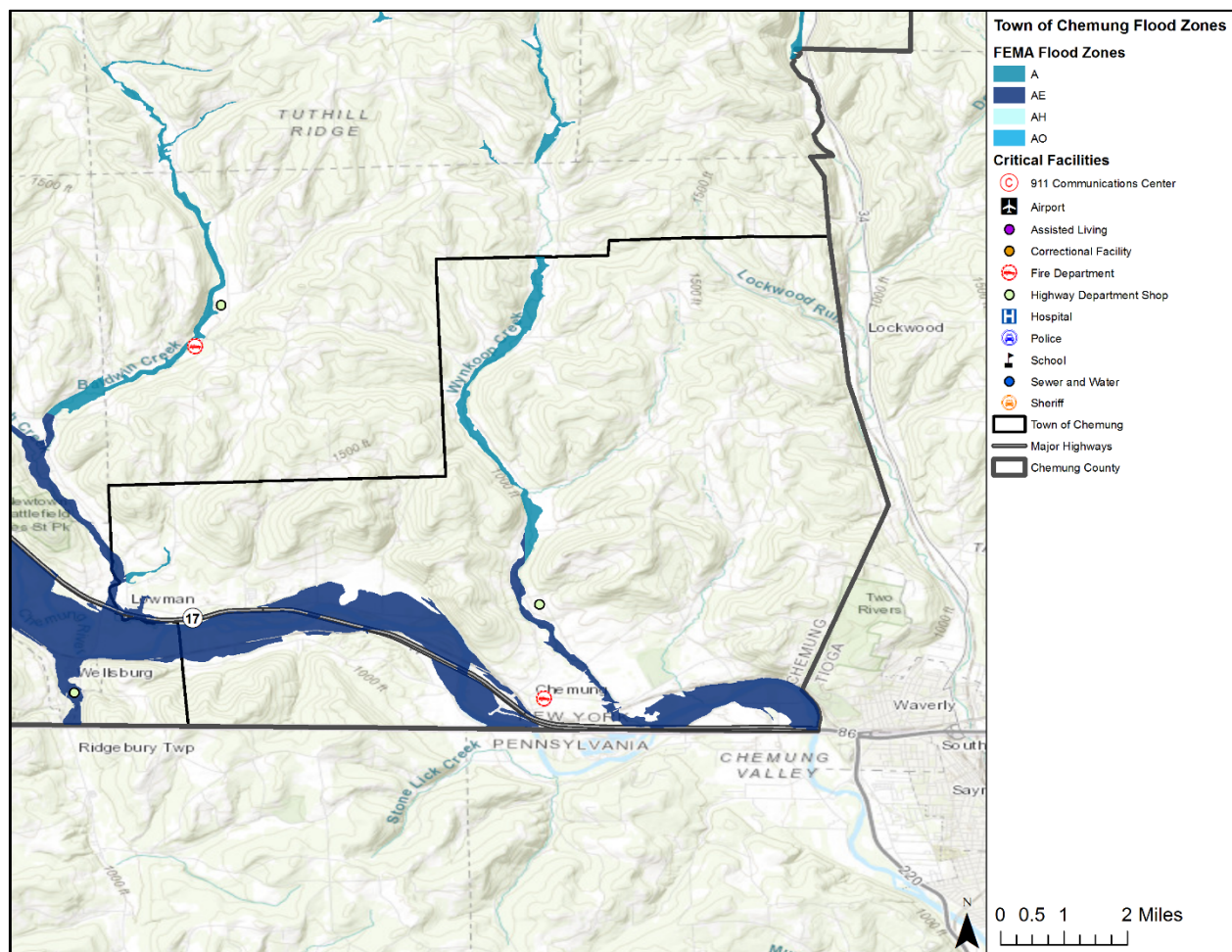
Table E-11. Potential Annualized Losses for the Town of Chemung

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Chemung	\$28,070	\$446

FLOOD

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. Full flood zone delineations with elevations are available in the Town of Chemung. The location of estimated flood zones for the Town of Chemung, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure E-3.

Figure E-3. Estimated Flood Zones in the Town of Chemung

HISTORICAL OCCURRENCES

Table E-12 depicts historical occurrences of flood events for the Town of Chemung according to the National Centers for Environmental Information (NCEI) data. From January 1996 to June 2018, 3 flood events were known to have impacted the Town of Chemung, based upon NCEI records. Flood events are often reported on a county-wide basis, or under-reported for individual municipalities, particularly in small communities such as the Town of Chemung.

Table E-12. Historical Flood Events, 1996-2018¹²

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Chemung	3/15/2007	0	0	\$0	\$0

¹² Values are in 2018 dollars. Events reported from January 1996 through June 2018.

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Chemung	4/20/2007	0	0	\$0	\$0
Town of Chemung	4/27/2011	0	0	\$447,454	\$0
Town of Chemung Totals		0	0	\$447,454	

Based on the list of historical flood events for the Town of Chemung, none of the reported events have occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Chemung can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Town of Chemung is highly likely.

VULNERABILITY AND IMPACT

Table E-13 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table E-13. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Town of Chemung	None

Historic loss estimates due to flood are presented in Table E-14 below.

Table E-14. Potential Annualized Losses, 1996-2018¹³

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Chemung	3	0	0	\$447,454	\$19,455

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table E-15 depicts the level of impact for the Town of Chemung.

¹³ Events reported from January 1996 through June 2018.

Table E-15 Town of Chemung Impact

JURISDICTION	IMPACT	DESCRIPTION
Town of Chemung	Limited	The Town of Chemung could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Town of Chemung currently participates in the National Flood Insurance Program as well as the Community Rating System and has in place a flood damage prevention ordinance that includes standards above the minimum FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Town of Chemung has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Town of Chemung as a high-risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. The Town of Chemung has a designated floodplain administrator. The Chemung floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the Town of Chemung outlines the minimum requirements for development in special flood hazard areas. Table E-16 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table E-16. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Town of Chemung	01/26/2016	08/22/2012	Good Standing	23

REPETITIVE LOSS

The Town of Chemung currently has no repetitive loss or severe repetitive loss properties.

TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

Figure E-4 identifies the locations of previous occurrences in the Town of Chemung from January 1983 through June 2018. Table E-17 depicts historical occurrences of tornado events for the Town of Chemung according to the National Centers for Environmental Information (NCEI) data. From January 1983 to June 2018, 2 tornado events are known to have impacted the Town of Chemung, based upon NCEI records.

Figure E-4. Spatial Historical Tornado Events, 1983-2018

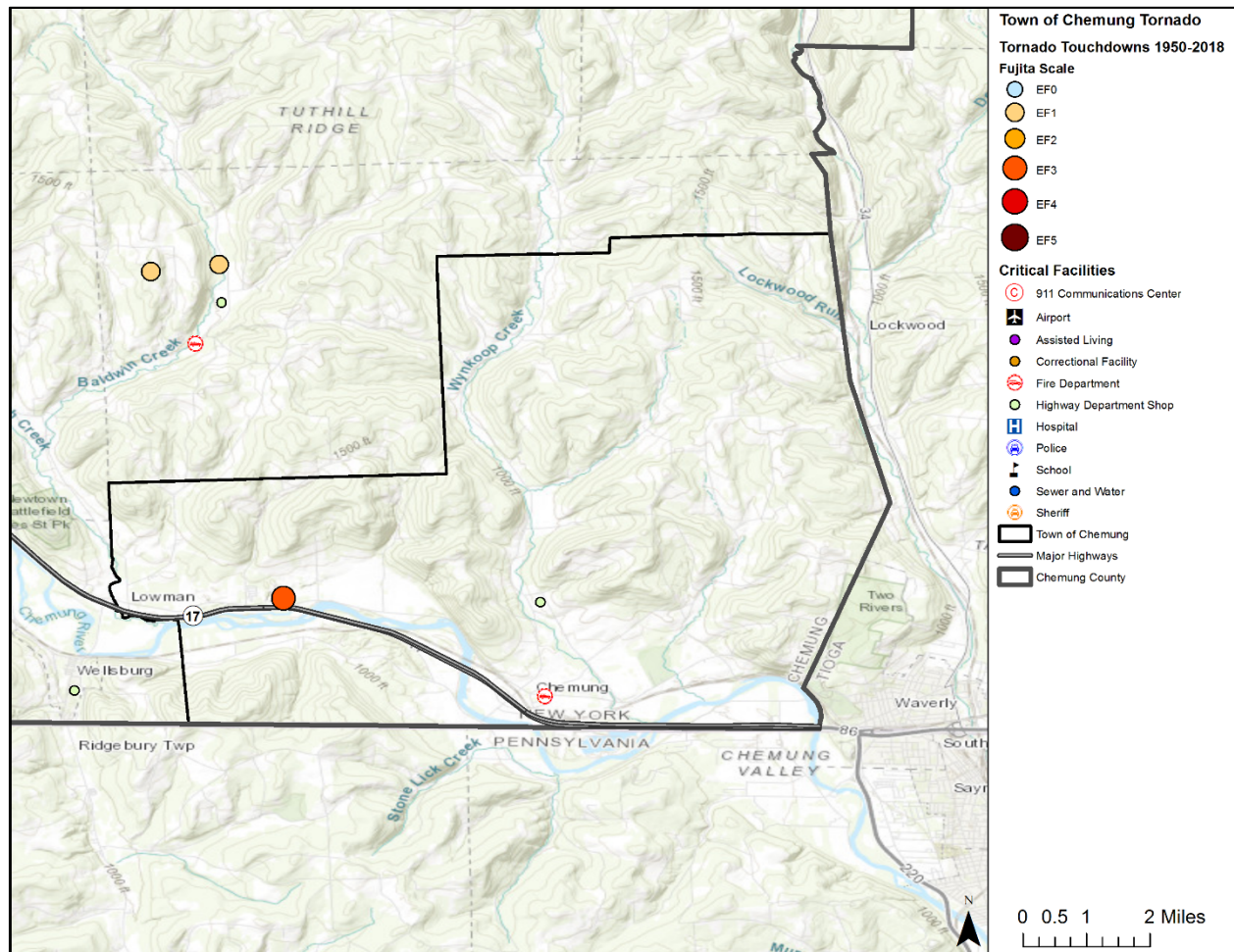


Table E-17. Historical Tornado Events, 1983-2018^{14,15}

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Chemung	7/26/2012	3:01 PM	EF1	0	0	\$38,435	\$0
Town of Chemung	9/2/2014	6:10 PM	EF1	0	0	\$105,695	\$0

¹⁴ Damages are reported from January 1983 through June 2018.

¹⁵ Magnitude is listed when available. Damage values are in 2018 dollars.

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Chemung Totals			EF1	0	0	\$144,130	

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Town of Chemung can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Town of Chemung is likely.

VULNERABILITY AND IMPACT

The U.S. Census data indicates a total of 223 manufactured homes (Table E-18) located in the Town of Chemung (20.5% of housing units). In addition, 67.5% (approximately 736 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table E-18. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Chemung	223	736

The following critical facilities would be vulnerable to tornado events in the Town of Chemung:

Table E-19. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Chemung	1 Fire Station, 1 Highway Department Shop

The average loss estimate of property and crop is \$144,130 (in 2018 dollars), having an approximate annual loss estimate of \$4,060 (Table E-20). Based on historic loss and damages, the impact of tornado on the Town of Chemung can be considered "Limited," with less than 10 percent of property expected to be destroyed.

Table E-20. Potential Annualized Losses, 1983-2018¹⁶

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Chemung	\$144,130	\$4,060

LANDSLIDE

The Town of Chemung has no known areas susceptible or prone to landslide (Section 9). The Town of Chemung has no known historical occurrences of landslide and does not anticipate any landslide events in the future. The municipality determined that this hazard is not a threat to the township and therefore does not require further analysis.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Mallory Rd, Wyncoop Creek Rd to first bridge 2. Mallory Rd, first bridge to second bridge.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	All are complete.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Funding not secured. Action will be included in Plan Update.
Flood-11a	Improve Drainage System	Flood	Upgrade all dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project is partially completed. Action will be included in Plan Update.

¹⁶ Events recorded from January 1983 through June 2018.

NEW MITIGATION ACTIONS

Roberts Hollow Road Bridge Replacement		Town of Chemung – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Roberts Hollow Road bridge is undersized and in need of replacement. The hydraulic capacity of this structure may not comply with commonly accepted standards.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Roberts Hollow Road bridge shall be replaced with an upgraded box culvert. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) and guide railing shall be installed. The existing roadway within the limits of construction shall be repaved.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new box culvert with headwalls and guiderail will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$520,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	Town Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing bridge with bridge structure (concrete abutments & steel superstructure)	>\$630,000	More expensive than box culvert option
	Eliminate Roberts Hollow Road Bridge	<\$30,000	Not practicable. Crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Rowley Road Culvert Replacements & Stream Stabilization		Town of Chemung – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Two existing culverts below Rowley Road are undersized and in need of replacement. The hydraulic capacity of this structure may not comply with commonly accepted standards.		
Action or Project Intended for Implementation			
Description of the Solution	Two existing culverts shall be replaced with upgraded culverts. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) and guide railing shall be installed. In addition, complimentary stream stabilization work shall be completed for the stream that flows through these culverts.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm event (approx.)	Estimated Benefits (losses avoided)	Two new culverts with headwalls and guiderail will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$175,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	Town Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culverts with bridge structures (concrete abutments & steel superstructure)	>\$300,000	More expensive than option involving replacements with culverts
	Eliminate the two culverts on Rowley Road	<\$30,000	Not practicable. Crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Mallory Road Culvert Replacement		Town of Chemung – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	An existing culvert below Mallory Road (near Miller Hollow Road) is undersized and in need of replacement. The hydraulic capacity of this structure may be insufficient to accommodate peak storm flows of commonly accepted design return periods.		
Action or Project Intended for Implementation			
Description of the Solution	The existing culvert shall be replaced with an upgraded culvert. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) shall be installed.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm event (approx.)	Estimated Benefits (losses avoided)	New culvert with headwalls will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$40,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	Town Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culvert with bridge structures (concrete abutments & steel superstructure)	>\$250,000	More expensive than option involving replacements with culvert
	Eliminate this culvert crossing on Mallory Road	<\$20,000	Not practicable. Crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Town of Chemung – 4	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$5,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Buyout Damaged Properties		Town of Chemung – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Homes have sustained repetitive flood losses. The Town of Chemung has offered to assist the occupants with the buyout process. Will need to secure grant funding to proceed.		
Action or Project Intended for Implementation			
Description of the Solution	Buyout homes in the highest risk floodplain areas in order to relocate residents to safer locations, permanently eliminate the risk of repetitive damage to homes, and restore natural floodplain functions. The Town of Chemung will identify willing sellers, pursue grant funding, and assist with the buyout process.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	Reduce the damage to residential property and the disruption to life caused by repeated flooding.
Useful Life	60 years		
Estimated Cost	>\$1,000,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Continuing repetitive losses; Residents remain in harm's way; Emergency services required in high risk areas
	Relocate homes	>\$2,000,000	Less cost effective; Less feasible option due to age of structures
	Proposed Action	>\$1,000,000 (Depending on the number of willing participants)	Cost effective alternative; No residual risk
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Dirt Road Upgrades		Town of Chemung – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excessive rain causes dirt roads to turn into mud soup and can cause ditches to overflow. Road improvements are needed.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year	Estimated Benefits (losses avoided)	Improved hydraulic capacity; Reduction in sediment build-up issues; Improved reliability for roadway; Improved safety for motorists; Improved aquatic habitat of stream
Useful Life	50 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	\$150,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		Town of Chemung – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Chemung Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Chemung	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	TOWN OF CHEMUNG
Capital Improvements Plan	
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	x
Economic Development Plan	
Emergency Operations Plan	x
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	x
Land Use Plan	x
Open Space Plan	x
Post-disaster Recovery Plan	
Redevelopment Plan	x
Stormwater Management Plan	x
Transportation Plan	x
Watershed Protection Plan	x
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	x
Real Estate Disclosure Requirements	x
Site Plan Review Requirements	x
Stormwater Ordinance	x
Subdivision Regulations	x
Watershed Ordinance	

ANNEX E: TOWN OF CHEMUNG

COMMUNITY CAPABILITY CHECKLIST	TOWN OF CHEMUNG
Zoning Ordinance/Land Use Restrictions	x
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	x
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	x
Public Education/Awareness Programs	x
Stream Maintenance Program	x
Storm Drainage Systems Maintenance Program	x
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	x
Environmental Conservation Specialist	x
Floodplain Administrator	x
GIS Specialist	x
Personnel with Hazard Knowledge	x
Planner	x
Public Information Official	x
Resource Development/Grant Writer	

ANNEX F: CITY OF ELMIRA

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JURISDICTION PROFILE

OVERVIEW

The City of Elmira is located in Chemung County, New York, with a population just over 29,000. The city is the county seat of Chemung County. The City of Elmira is in the south-central part of the county, surrounded on three sides by the Town of Elmira. It is in the Southern Tier of New York, a short distance north of the Pennsylvania state line. According to the United States Census Bureau, the city has a total area of 7.6 square miles, of which 7.3 square miles is land and 0.3 square miles, or 3.56%, is water. The Chemung River flows eastward through the city. Newtown Creek, flowing from the north, joins the Chemung River at the city's southeast corner. Figure F-1 shows the general location of the City of Elmira.

CITY OF ELMIRA CONTACT INFORMATION

Name: Dan Mandell

Title: Mayor

Phone: (607)737-2095

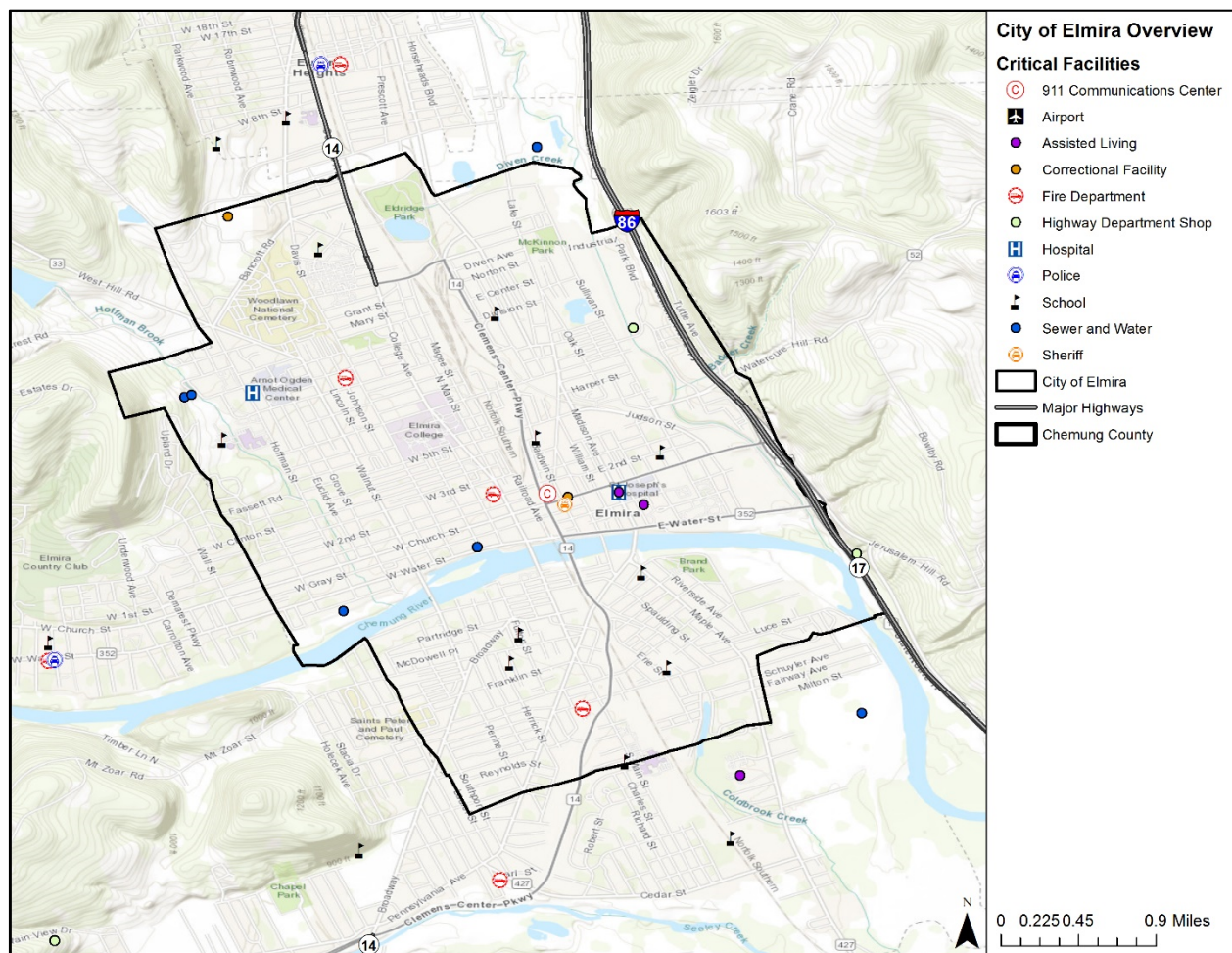
Address: 317 E Church Street, Elmira, NY 14901

Email: djmandell@cityofelmira.net

NOTE TO THE REVIEWER

It is noted that the City of Elmira and the Town of Elmira are not listed separately in the NCEI. The NCEI is the most reliable source for historical storm event data. While the plan incorporates local and team input for historical events, for the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

Figure F-1. City of Elmira Planning Area



POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The City of Elmira had a population of 29,200 residents. Table F-1 provides the population distribution within the City of Elmira.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table F-1. Population Distribution for the City of Elmira

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
City of Elmira	29,200	32.9%	2,086	7,912

POPULATION GROWTH

The official 2010 City of Elmira population is 29,200. Overall, the City of Elmira experienced a decrease in population between 1980 and 2010 by 17.3%, or a decrease of 6,127 people. Table F-2 provides historic change rates in the City of Elmira.

Table F-2. Population for the City of Elmira, 1980-2010

JURISDICTION	1980 ²	1990 ³	2000 ⁴	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
City of Elmira	35,327	33,724	30,940	29,200	-6,127	-17.3%	-1,740	-5.6%

FUTURE DEVELOPMENT

To better understand how future growth and development in the City of Elmira might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table F-3, as provided Cornell University's Program on Applied Demographics⁵. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

³ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁴ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁵ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table F-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

HAZARD DESCRIPTION, LOCATION, EXTENT & HISTORICAL OCCURENCES

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the City of Elmira, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the City of Elmira experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the City of Elmira is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the City of Elmira are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the City of Elmira:

Table F-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
City of Elmira	1 911 Communication Center, 2 Correctional Facilities, 3 Fire Stations, 1 Highway Department Shop, 2 Hospitals, 2 Assisted Living Facilities, 2 Police Stations, 11 Schools, 4 Water/Wastewater Facilities

Population over 65 in the City of Elmira is estimated at 11.3% of the total population or an estimated total of 3,228⁶ potentially vulnerable residents in the planning area based on age. (Table F-5).

Table F-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
City of Elmira	3,228

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table F-6 depicts historical occurrences of thunderstorm wind events for the City of Elmira according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 24 thunderstorm wind events are known to have impacted the City of Elmira, based upon NCEI records.

Table F-6. Historical Thunderstorm Wind Events, 1955-2018⁷⁸

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Elmira	8/24/1993	3:00 PM	Unknown	0	0	\$86,874	\$0
City of Elmira	8/24/1993	3:55 PM	Unknown	0	0	\$86,874	\$0
City of Elmira	7/6/1994	2:45 PM	Unknown	0	0	\$8,477	\$0
City of Elmira	7/6/1995	2:10 PM	Unknown	0	0	\$6,599	\$0
City of Elmira	5/10/1996	6:00 PM	Unknown	0	0	\$40,164	\$0
City of Elmira	5/2/2004	4:42 PM	58	0	0	\$0	\$0
City of Elmira	6/10/2005	4:15 PM	50	0	0	\$6,468	\$0

⁶ US Census Bureau 2016 data for the City of Elmira.

⁷ Damages are reported from January 1955 through June 2018.

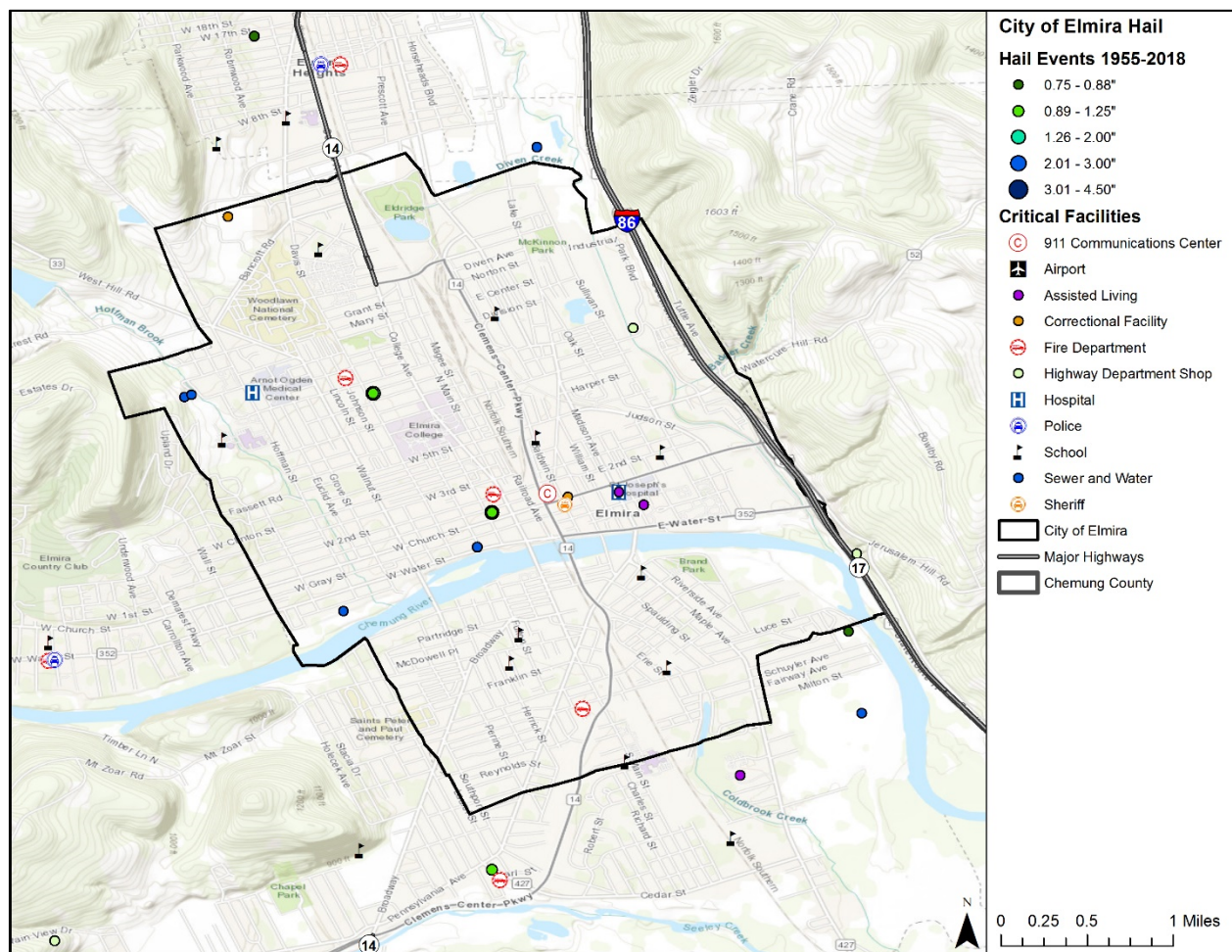
⁸ Magnitude is listed when available. Damage values are in 2018 dollars.

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Elmira	7/26/2005	6:40 PM	50	0	0	\$2,575	\$0
City of Elmira	6/22/2006	8:10 PM	50	0	0	\$30,999	\$0
City of Elmira	8/3/2006	1:05 PM	50	0	0	\$1,234	\$0
City of Elmira	9/26/2007	4:35 PM	50	0	0	\$1,207	\$0
City of Elmira	6/25/2009	3:46 PM	53	0	0	\$0	\$0
City of Elmira	5/26/2011	3:50 PM	50	0	0	\$5,567	\$0
City of Elmira	5/26/2011	3:55 PM	50	0	0	\$11,134	\$0
City of Elmira	5/26/2011	4:04 PM	50	0	0	\$5,567	\$0
City of Elmira	5/26/2011	7:28 PM	50	0	0	\$22,268	\$0
City of Elmira	7/26/2012	3:02 PM	50	0	0	\$5,491	\$0
City of Elmira	9/6/2012	3:12 PM	50	0	0	\$1,087	\$0
City of Elmira	7/18/2013	3:40 PM	50	0	0	\$5,385	\$0
City of Elmira	6/16/2014	5:23 PM	50	0	0	\$0	\$0
City of Elmira	7/25/2016	2:05 PM	50	0	0	\$3,137	\$0
City of Elmira	4/16/2017	2:40 PM	50	0	0	\$1,029	\$0
City of Elmira	5/1/2017	5:57 PM	60	0	0	\$10,280	\$0
City of Elmira	5/1/2017	6:01 PM	50	0	0	\$10,280	\$0
City of Elmira Totals				0	0	\$352,695	

Based on the list of historical thunderstorm wind events for the City of Elmira, eight of the reported events have occurred since the 2012 Plan.

HAIL

Historical evidence shown in Figure F-2 demonstrates that the City of Elmira is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Table F-7 depicts historical occurrences of hail events for the City of Elmira according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 12 hail events are known to have impacted the City of Elmira, based upon NCEI records. Historical hail events are often provided on a county-wide basis in the NCEI database. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

Figure F-2. Historical Hail Events, 1955-2018**Table F-7. Historical Hail Events, 1955-2018⁹¹⁰**

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Elmira	6/2/2000	12:55 PM	1.0	0	0	\$0	\$0
City of Elmira	6/29/2006	4:50 PM	1.0	0	0	\$0	\$0
City of Elmira	7/9/2007	4:45 PM	0.88	0	0	\$0	\$0
City of Elmira	9/27/2007	5:43 PM	0.75	0	0	\$0	\$0
City of Elmira	9/27/2007	5:53 PM	0.88	0	0	\$0	\$0

⁹ Damages are reported from January 1955 through June 2018.

¹⁰ Magnitude is listed when available. Damage values are in 2018 dollars.

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Elmira	5/26/2011	3:54 PM	1.25	0	0	\$0	\$0
City of Elmira	5/27/2011	6:45 PM	1.0	0	0	\$0	\$0
City of Elmira	9/6/2012	3:50 PM	1.75	0	0	\$10,872	\$0
City of Elmira	6/28/2013	2:50 PM	1.0	0	0	\$0	\$0
City of Elmira	6/28/2013	3:00 PM	1.0	0	0	\$0	\$0
City of Elmira	6/12/2015	6:40 PM	1.0	0	0	\$3,163	\$0
City of Elmira	6/5/2017	4:25 PM	1.0	0	0	\$1,027	\$0
City of Elmira Totals				0	0	\$15,062	

Based on the list of historical hail events for the City of Elmira, five reported events have occurred since the 2012 Plan.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the City of Elmira. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the City of Elmira can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the City of Elmira is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 20 manufactured homes (approximately 0.2%) located in the City of Elmira. In addition, 96.8% (approximately 11,517 structures) of the residential structures in the City of Elmira were built before 1980 (Table F-8). These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table F-8. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
City of Elmira	20	11,517

The following critical facilities (Table F-9) would be vulnerable to thunderstorm events in the City of Elmira:

Table F-9. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
City of Elmira	1 911 Communication Center, 2 Correctional Facilities, 3 Fire Stations, 1 Highway Department Shop, 2 Hospitals, 2 Assisted Living Facilities, 2 Police Stations, 11 Schools, 4 Water/Wastewater Facilities

Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the City of Elmira has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the City of Elmira would be "Limited," with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$367,757 having an approximate annual loss estimate of \$5,791 (Table F-10).

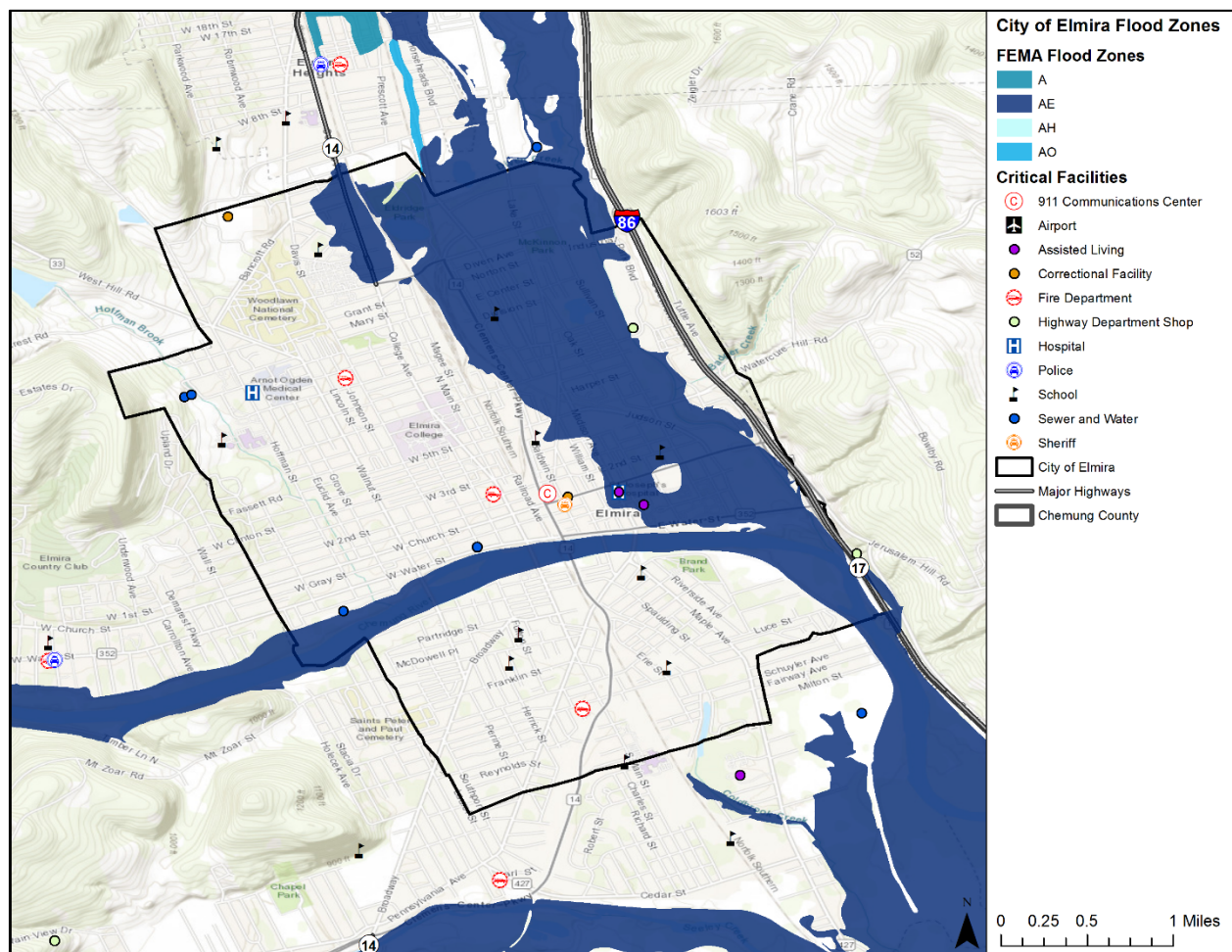
Table F-10. Potential Annualized Losses for the City of Elmira

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
City of Elmira	\$367,757	\$5,791

FLOOD

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. Full flood zone delineations with elevations are available in the City of Elmira. The location of estimated flood zones for the City of Elmira, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure F-3.

Figure F-3. Estimated Flood Zones in the City of Elmira

HISTORICAL OCCURRENCES

Table F-11 depicts historical occurrences of flood events for the City of Elmira according to the National Centers for Environmental Information (NCEI) data. From January 1996 to June 2018, 4 flood events were known to have impacted the City of Elmira, based upon NCEI records. Flood events are often reported on a county-wide basis, or under-reported for individual municipalities, particularly in smaller communities.

Table F-11. Historical Flood Events, 1996-2018¹¹

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Elmira	8/30/2004	0	0	\$6,638	\$0
City of Elmira	3/15/2007	0	0	\$6,126	\$0

¹¹ Values are in 2018 dollars. Events reported from January 1996 through June 2018.

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Elmira	9/7/2011	0	0	\$1,108,859	\$0
City of Elmira	7/14/2015	0	0	\$105,420	\$0
City of Elmira Totals		0	0	\$1,227,043	

Based on the list of historical flood events for the City of Elmira, one of the reported events has occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the City of Elmira can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the City of Elmira is highly likely.

VULNERABILITY AND IMPACT

Table F-12 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table F-12. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
City of Elmira	3 Schools, 1 Hospital, 1 Assisted Living Facility

Historic loss estimates due to flood are presented in Table F-13 below.

Table F-13. Potential Annualized Losses, 1996-2018¹²

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
City of Elmira	4	0	0	\$1,227,043	\$54,535

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table F-14 depicts the level of impact for the City of Elmira.

¹² Events reported from January 1996 through June 2018.

Table F-14 City of Elmira Impact

JURISDICTION	IMPACT	DESCRIPTION
City of Elmira	Limited	The City of Elmira could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The City of Elmira currently participates in the National Flood Insurance Program as well as the Community Rating System and has in place a flood damage prevention ordinance that includes standards above the minimum FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The City of Elmira have developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the City of Elmira as a high-risk hazard during hazard ranking activities at the Risk Assessment Workshop. Many of the mitigation actions for the jurisdiction were developed with flood mitigation in mind. The City of Elmira has a designated floodplain administrator. The floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinances adopted by the City of Elmira outlines the minimum requirements for development in special flood hazard areas. Table F-15 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table F-15. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
City of Elmira	N/A	09/27/2012	Good Standing	184

REPETITIVE LOSS

The City of Elmira currently has no repetitive loss or severe repetitive loss properties.

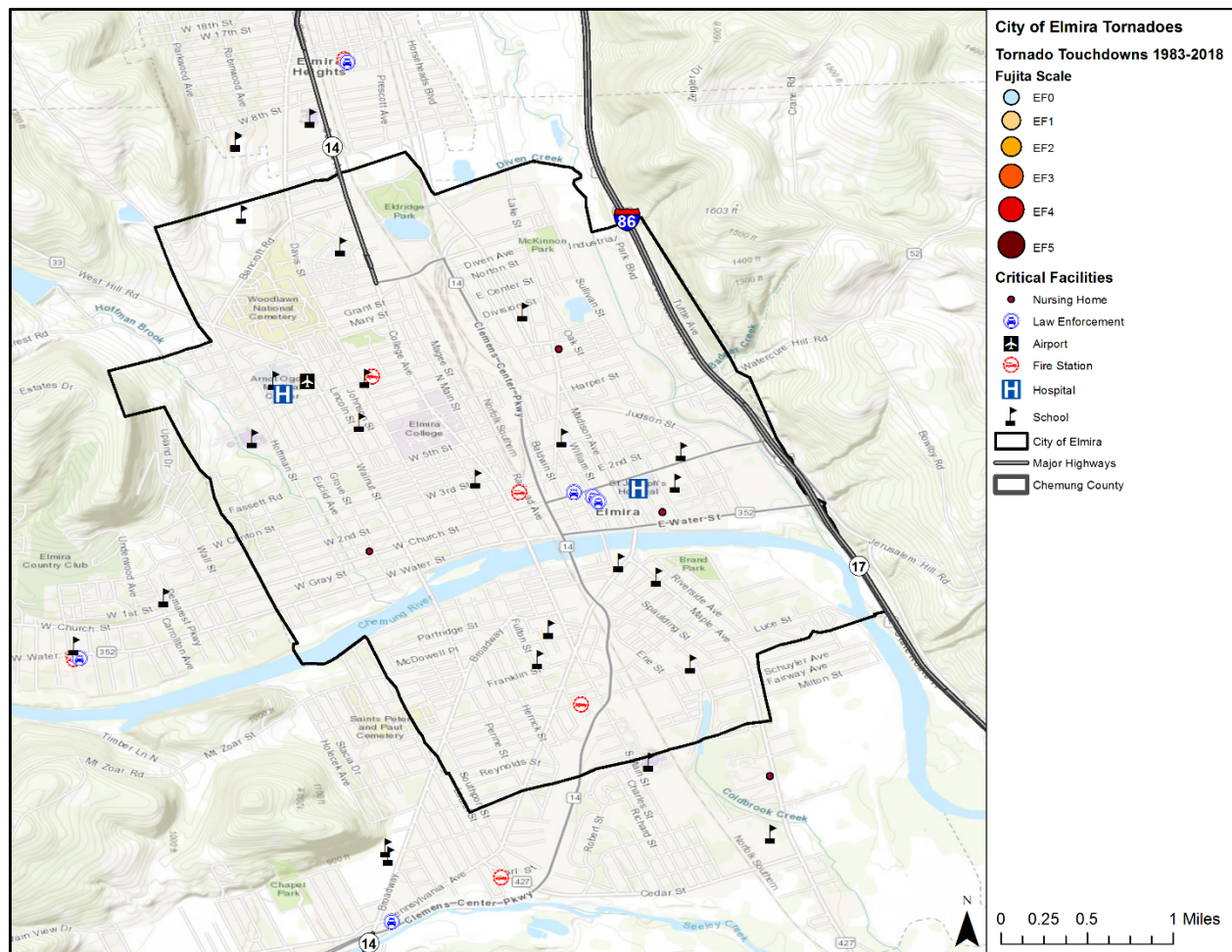
TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

Figure F-4 identifies the locations of previous occurrences in the City of Elmira from January 1983 through June 2018. Table F-16 depicts historical occurrences of tornado events for the City of Elmira according to the National Centers for Environmental Information (NCEI) data. From January 1983 to June 2018, 1 tornado event is known to have impacted the City of Elmira, based upon NCEI records.

Figure F-4. Spatial Historical Tornado Events, 1983-2018**Table F-16. Historical Tornado Events, 1983-2018¹³¹⁴**

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Elmira	7/26/2012	3:00 PM	EF1	0	0	\$10,981,388	\$0
City of Elmira Totals				0	0	\$10,981,388	

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the City of

¹³ Damages are reported from January 1983 through June 2018.

¹⁴ Magnitude is listed when available. Damage values are in 2018 dollars.

Elmira can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the City of Elmira is likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 20 manufactured homes (approximately 0.2%) located in the City of Elmira. In addition, 96.8% (approximately 11,517 structures) of the residential structures in the City of Elmira were built before 1980 (Table F-17). These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table F-17. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
City of Elmira	20	11,517

The following critical facilities would be vulnerable to tornado events in the City of Elmira:

Table F-18. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
City of Elmira	1 911 Communication Center, 2 Correctional Facilities, 3 Fire Stations, 1 Highway Department Shop, 2 Hospitals, 2 Assisted Living Facilities,, 2 Police Stations, 11 Schools, 4 Water/Wastewater Facilities

The average loss estimate of property and crop is \$10,981,388 (in 2018 dollars), having an approximate annual loss estimate of \$309,335 (Table F-19). Based on historic loss and damages, the impact of tornado on the City of Elmira can be considered "Limited," with less than 10 percent of property expected to be destroyed.

Table F-19. Potential Annualized Losses, 1983-2018¹⁵

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
City of Elmira	\$10,981,388	\$309,335

LANDSLIDE

The City of the Elmira has no known areas susceptible or prone to landslide (Section 9). The City of Elmira has no known historical occurrences of landslide and does not anticipate any landslide events in the future. The municipality has determined that this hazard is not a threat to their respective community and therefore does not require further analysis.

¹⁵ Events recorded from January 1983 through June 2018.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood-3a	Educate on Flood Mitigation Techniques	Flood	Created public education programs, in cooperation with local organizations, regarding yard waste and debris in and near streams and drainage ways, including clearing storm drains to prevent urban flooding. In addition, the City of Elmira would like to create a program that would allow residents to put grass/leaves out year around in paper bags so that they can be composted at the City's compost facility. City no longer owns facility, county opened county wide facility used by all residents.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Stream bank erosion, localized flooding, and reduce plugging in culverts. Project is completed. County wide over 9000 residents used this facility in 2018.
Flood-9	Floodplain Management	Flood	Provide technical assistance through STC for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.
Flood-10	Conduct Regular Maintenance for Drainage System	Flood	Complete various construction and maintenance projects and create a schedule for ongoing maintenance of completed projects. 1. Storm Drain improvements to lower Hoffman St @ Gray St to prevent flooding of Hoffman St businesses. Study has been completed. 2. Joint project with T/Elmira to complete flood control project, Fassett Rd and Hoffman St, study is complete.	Cost	Staff time, materials and equipment
				Level of Protection	10-year storm
				Damages Avoided; Evidence of Success	Ensuring life safety during events. Action will be included in Plan Update.
Flood-17	Educate on Flood Evacuation Routes	Flood	Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). All but City of Elmira need study and planning. Study is complete and plan is on paper but need funding to implement. Routes are in place.	Cost	\$347,000
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Ensuring life safety during events. Action will be included in Plan Update.

ANNEX F: CITY OF ELMIRA

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood-19	Improve Drainage System	Flood	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.	Cost	up to \$2,000 annually
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.

NEW MITIGATION ACTIONS

Upgrade existing Eldridge Park Stormwater Pump Station		City of Elmira – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The City owns and maintains a stormwater pump station at Eldridge Park. This stormwater pump station pumps stormwater from Eldridge Lake to a tributary to Newtown Creek. Upgrade of the pumps and electrical system is needed for this station, as well as the installation of an emergency generator.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade of the pumps and electrical systems and installation of an electric generator for the Eldridge Lake stormwater pump station.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm	Estimated Benefits (losses avoided)	Would control the storm run-off from a significant portion of the City, such to prevent ponding within developed portions of the City.
Useful Life	50 Years		
Estimated Cost	\$425,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	All Federal, State, Local Funding HMGP, PDM FMA And chips
Responsible Organization	City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Local improvements plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Flood damages will continue
	Complete replacement of existing stormwater pump station	>\$800,000	The complete replacement of the pump station would have a significant project cost.
	Elimination of Eldridge Lake stormwater pump station	\$100,000	This would result in increased flooding levels and risks for a sizeable portion of the City.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Fassett Road Storm Sewer Project		City of Elmira – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The portion of Fassett Road between Hoffman Street and ABC Drive is prone to flooding from runoff from a developed upland watershed. Approximately once per year, this portion of Fassett Road becomes completely inundated with water depths of over 1 foot. This inundation presents hazards to both motorists and pedestrians, as well as to adjacent residents.		
Action or Project Intended for Implementation			
Description of the Solution	The installation of a storm sewer system that would collect runoff uphill of ABC Drive and convey this runoff (as well as runoff from Fassett Road) to a discharge point on Hoffman Brook. The goal of this work is to more reliably drain Fassett Road such to reduce the frequency of flooding/inundation.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm	Estimated Benefits (losses avoided)	This Action Item would provide improved stormwater collection and conveyance for a portion of Fassett Road that is prone to flooding/inundation, to reduce the frequency of flooding/inundation.
Useful Life	50 Years		
Estimated Cost	\$1,700,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	3 years	Potential Funding Sources	All Federal, State, Local Funding HMGP, PDM FMA And chips
Responsible Organization	City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Local improvements plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Flood damages will continue
	Installation of stormwater detention basin in upland watershed to reduce peak flows to Fassett Road.	>\$750,000	An open location of adequate size to site a stormwater detention basin does not exist at this time.
	Installation of stormwater pump station for this portion of Fassett Road	>\$700,000	High O & M costs. Need to obtain easement to site/construct on adjacent private property.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		City of Elmira – 3	
Risk/Vulnerability			
Hazard of Concern	Winter Storm, Thunderstorm, Flood, Tornado, Landslide		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; Preventable property damage will continue
	Implement mitigation measures for residential structures	Dependent on the number of structures and the type of retrofit	Less cost effective; Dependent on participation
	Proposed project	\$5,000	Considered cost effective; most feasible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Floodplain Management		City of Elmira – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Drainage System Improvements		City of Elmira – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Inadequate drainage systems along Coleman Avenue, Fassett Road and Hoffman Street cause flooding, damages to roadways, and create hazardous driving conditions for motorists.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade the stormwater system on Coleman Avenue, Fassett Road and Hoffman Street to prevent flooding.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10 yr. storm	Estimated Benefits (losses avoided)	Improved reliability for roadway; Improved safety for motorists.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grants
Responsible Organization	City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	Staff time	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Maintenance on the Old Chemung Canal Project		City of Elmira – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Chemung Canal joined the Chemung River, extending northward linking the river to the Erie Canal via Seneca Lake. The canal paralleled the Chemung River for long sections, sharing part of its water and drainage basin, by building dams and locks. The Canal has is no longer in use, but the remains are still in place. This area becomes paralyzed by the regional rains and flooding requiring maintenance.		
Action or Project Intended for Implementation			
Description of the Solution	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm	Estimated Benefits (losses avoided)	Continued maintenance of this program would result in
Useful Life	50 years		
Estimated Cost	\$2,000 per municipality		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Local funding sources
Responsible Organization	City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Increases in debris and sediment will increase flood depths and damages
	Complete removal of the canal remnants and alternative drainage mitigation	\$50,000,000	Not cost effective; Significant Environmental concerns
	Proposed Project	\$2,000 per municipality	Cost effective; reduces future flood damages
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		City of Elmira – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The City of Elmira Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	City of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	City of Elmira
Capital Improvements Plan	
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	
Economic Development Plan	
Emergency Operations Plan	
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	
Real Estate Disclosure Requirements	
Site Plan Review Requirements	
Stormwater Ordinance	
Subdivision Regulations	
Watershed Ordinance	

COMMUNITY CAPABILITY CHECKLIST	City of Elmira
Zoning Ordinance/Land Use Restrictions	
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	
Public Education/Awareness Programs	
Stream Maintenance Program	
Storm Drainage Systems Maintenance Program	
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	x
Environmental Conservation Specialist	
Floodplain Administrator	x
GIS Specialist	
Personnel with Hazard Knowledge	x
Planner	
Public Information Official	
Resource Development/Grant Writer	

ANNEX G: TOWN OF ELMIRA

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JURISDICTION PROFILE

OVERVIEW

The Town of Elmira is located in Chemung County, New York, with a population just under 7,000. The town surrounds the City of Elmira on three sides. The town is in the south-central part of the county, in the Southern Tier of New York. It is part of the Elmira Metropolitan Statistical Area. According to the United States Census Bureau, the town has a total area of 22.5 square miles, of which 22.2 square miles is land and 0.3 square miles, or 1.46%, is water. The Chemung River, a tributary of the Susquehanna River, forms part of the south town line, and Newtown Creek partly divides the town from the City of Elmira. Figure G-1 shows the general location of the Town of Elmira.

TOWN OF ELMIRA CONTACT INFORMATION

Name: David Sullivan

Title: Mayor/Supervisor

Phone: (607)734-2031

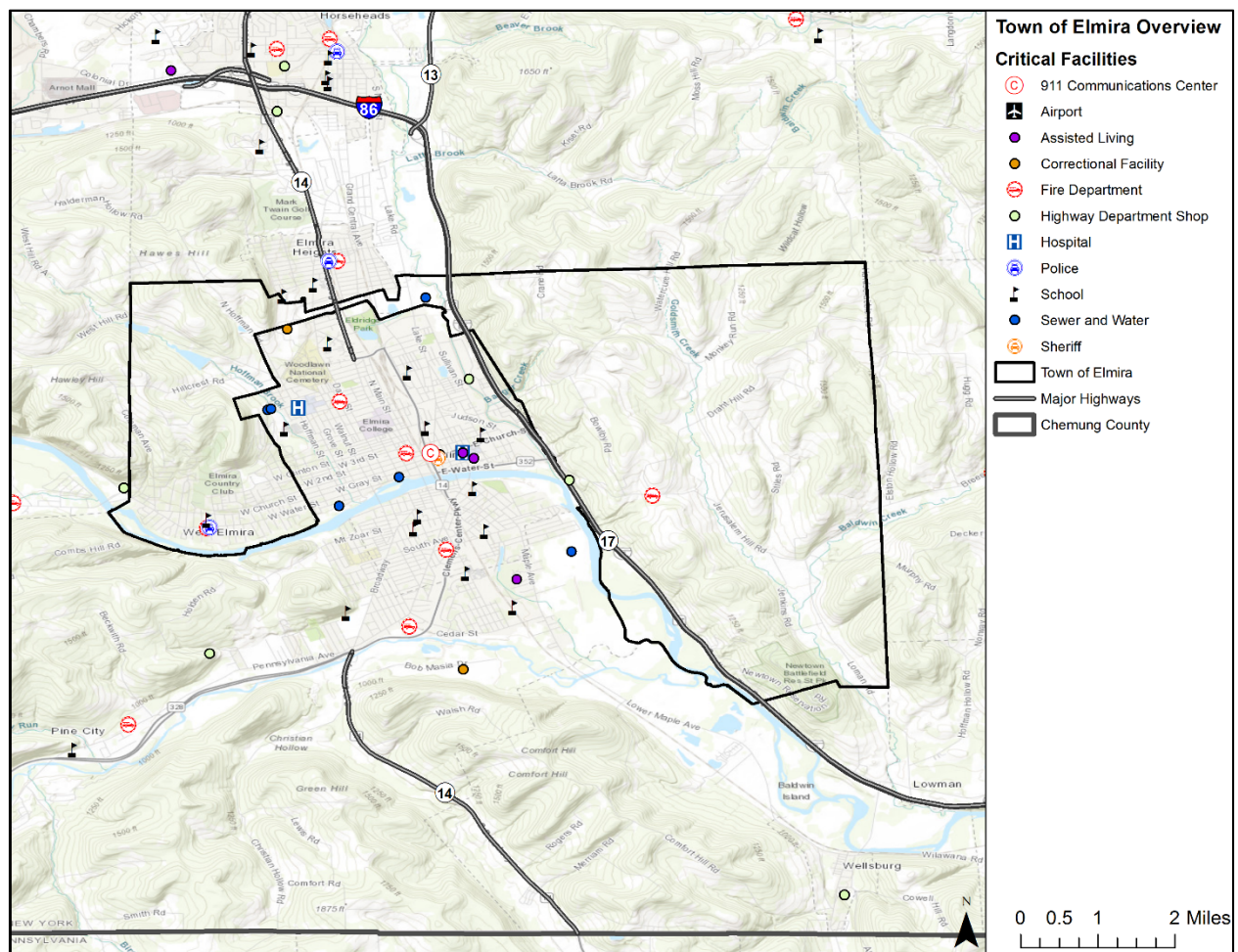
Address: 1255 West Water Street, Elmira, NY
14905

Email: dsullivan@townofelmira.com

NOTE TO THE REVIEWER

It is noted that the City of Elmira and the Town of Elmira are not listed separately in the NCEI. The NCEI is the most reliable source for historical storm event data. While the plan incorporates local and team input for historical events, for the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

Figure G-1. Town of Elmira Planning Area



POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Town of Elmira had a population of 29,200 residents. Table G-1 provides the population distribution within the Town of Elmira.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table G-1. Population Distribution for the Town of Elmira

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Elmira	6,934	7.9%	1,355	448

POPULATION GROWTH

The official 2010 Town of Elmira population is 6,934. Overall, the Town of Elmira experienced a decrease in population between 1980 and 2010 by 9.2%, or a decrease of 701 people. Table G-2 provides historic change rates in the Town of Elmira.

Table G-2. Population for the Town of Elmira, 1980-2010

JURISDICTION	1980 ²	1990 ³	2000 ⁴	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Town of Elmira	7,635	7,440	7,199	6,934	-701	-9.2%	-265	-3.7%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Town of Elmira might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table G-3, as provided Cornell University's Program on Applied Demographics⁵. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

³ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁴ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁵ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table G-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

HAZARD DESCRIPTION, LOCATION, EXTENT & HISTORICAL OCCURENCES

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Town of Elmira, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Town of Elmira experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Town of Elmira is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Town of Elmira are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Town of Elmira:

Table G-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Elmira	2 Fire Stations, 3 Highway Department Shop, 1 Police Station, 6 Schools, 1 Water/Wastewater Facility

Population over 65 in the Town of Elmira is estimated at 26.9% of the total population or an estimated total of 1,834⁶ potentially vulnerable residents in the planning area based on age (Table G-5).

Table G-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Town of Elmira	1,834

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table G-6 depicts historical occurrences of thunderstorm wind events for the Town of Elmira according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 24 thunderstorm wind events are known to have impacted the Town of Elmira, based upon NCEI records.

Table G-6. Historical Thunderstorm Wind Events, 1955-2018⁷⁸

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Elmira	8/24/1993	3:00 PM	Unknown	0	0	\$86,874	\$0
Town of Elmira	8/24/1993	3:55 PM	Unknown	0	0	\$86,874	\$0
Town of Elmira	7/6/1994	2:45 PM	Unknown	0	0	\$8,477	\$0
Town of Elmira	7/6/1995	2:10 PM	Unknown	0	0	\$6,599	\$0
Town of Elmira	5/10/1996	6:00 PM	Unknown	0	0	\$40,164	\$0
Town of Elmira	5/2/2004	4:42 PM	58	0	0	\$0	\$0
Town of Elmira	6/10/2005	4:15 PM	50	0	0	\$6,468	\$0

⁶ US Census Bureau 2016 data for the Town of Elmira.

⁷ Damages are reported from January 1955 through June 2018.

⁸ Magnitude is listed when available. Damage values are in 2018 dollars.

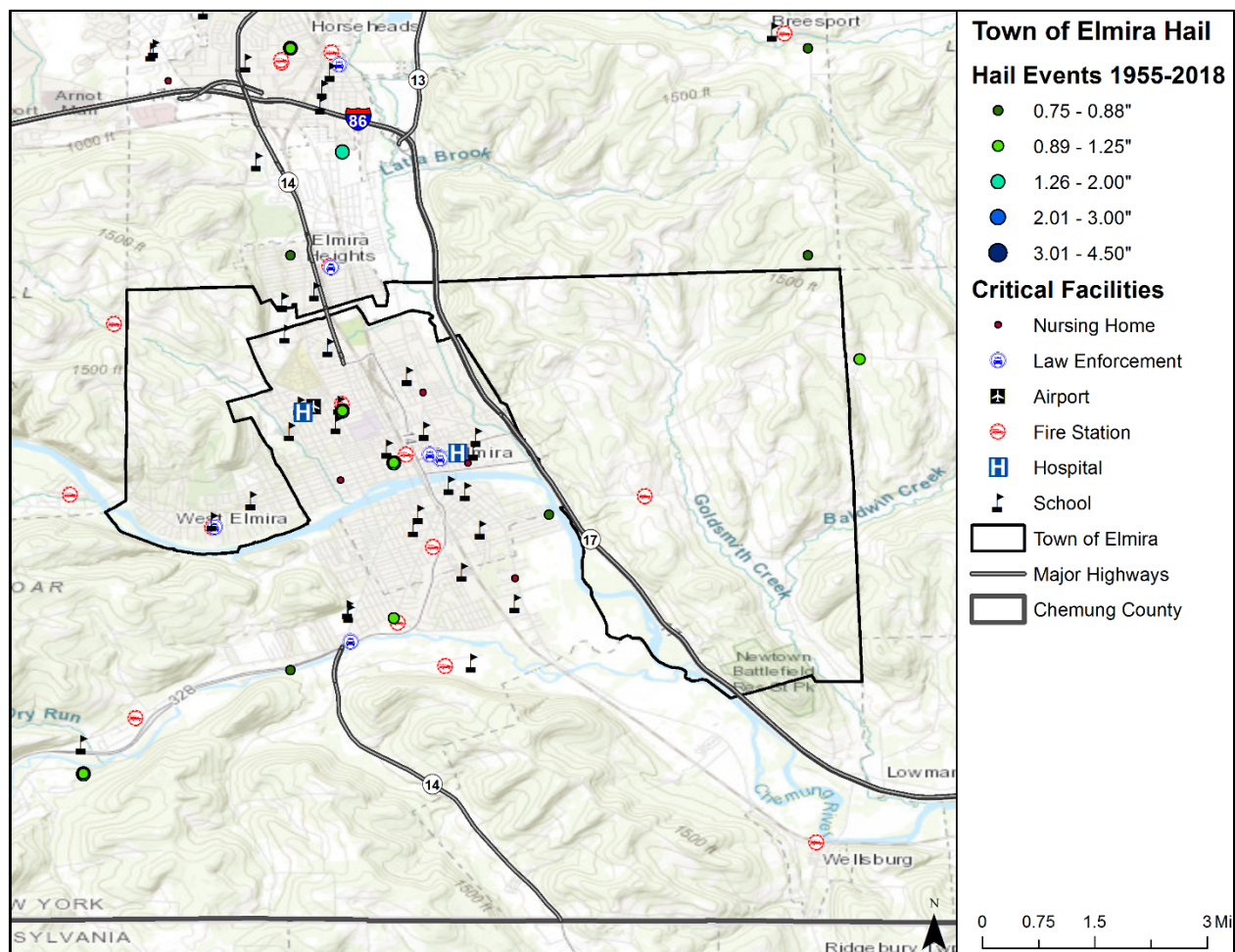
JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Elmira	7/26/2005	6:40 PM	50	0	0	\$2,575	\$0
Town of Elmira	6/22/2006	8:10 PM	50	0	0	\$30,999	\$0
Town of Elmira	8/3/2006	1:05 PM	50	0	0	\$1,234	\$0
Town of Elmira	9/26/2007	4:35 PM	50	0	0	\$1,207	\$0
Town of Elmira	6/25/2009	3:46 PM	53	0	0	\$0	\$0
Town of Elmira	5/26/2011	3:50 PM	50	0	0	\$5,567	\$0
Town of Elmira	5/26/2011	3:55 PM	50	0	0	\$11,134	\$0
Town of Elmira	5/26/2011	4:04 PM	50	0	0	\$5,567	\$0
Town of Elmira	5/26/2011	7:28 PM	50	0	0	\$22,268	\$0
Town of Elmira	7/26/2012	3:02 PM	50	0	0	\$5,491	\$0
Town of Elmira	9/6/2012	3:12 PM	50	0	0	\$1,087	\$0
Town of Elmira	7/18/2013	3:40 PM	50	0	0	\$5,385	\$0
Town of Elmira	6/16/2014	5:23 PM	50	0	0	\$0	\$0
Town of Elmira	7/25/2016	2:05 PM	50	0	0	\$3,137	\$0
Town of Elmira	4/16/2017	2:40 PM	50	0	0	\$1,029	\$0
Town of Elmira	5/1/2017	5:57 PM	60	0	0	\$10,280	\$0
Town of Elmira	5/1/2017	6:01 PM	50	0	0	\$10,280	\$0
Town of Elmira Totals				0	0	\$352,695	

Based on the list of historical thunderstorm wind events for the Town of Elmira, eight of the reported events have occurred since the 2012 Plan.

HAIL

Historical evidence shown in Figure G-2 demonstrates that the Town of Elmira is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Table G-7 depicts historical occurrences of hail events for the Town of Elmira according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 12 hail events are known to have impacted the Town of Elmira, based upon NCEI records. Historical hail events are often provided on a county-wide basis in the NCEI database. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

Figure G-2. Historical Hail Events, 1955-2018

Table G-7. Historical Hail Events, 1955-2018⁹¹⁰

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Elmira	6/2/2000	12:55 PM	1.0	0	0	\$0	\$0
Town of Elmira	6/29/2006	4:50 PM	1.0	0	0	\$0	\$0
Town of Elmira	7/9/2007	4:45 PM	0.88	0	0	\$0	\$0
Town of Elmira	9/27/2007	5:43 PM	0.75	0	0	\$0	\$0
Town of Elmira	9/27/2007	5:53 PM	0.88	0	0	\$0	\$0

⁹ Damages are reported from January 1955 through June 2018.

¹⁰ Magnitude is listed when available. Damage values are in 2018 dollars.

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Elmira	5/26/2011	3:54 PM	1.25	0	0	\$0	\$0
Town of Elmira	5/27/2011	6:45 PM	1.0	0	0	\$0	\$0
Town of Elmira	9/6/2012	3:50 PM	1.75	0	0	\$10,872	\$0
Town of Elmira	6/28/2013	2:50 PM	1.0	0	0	\$0	\$0
Town of Elmira	6/28/2013	3:00 PM	1.0	0	0	\$0	\$0
Town of Elmira	6/12/2015	6:40 PM	1.0	0	0	\$3,163	\$0
Town of Elmira	6/5/2017	4:25 PM	1.0	0	0	\$1,027	\$0
Town of Elmira Totals				0	0	\$15,062	

Based on the list of historical hail events for the Town of Elmira, five reported events have occurred since the 2012 Plan.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the Town of Elmira. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Elmira can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Town of Elmira is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 20 manufactured homes (approximately 0.2%) located in the Town of Elmira. In addition, 96.8% (approximately 11,517 structures) of the residential structures in the Town of Elmira were built before 1980 (Table G-8). These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table G-8. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Elmira	0	2,778

The following critical facilities (Table G-9) would be vulnerable to thunderstorm events in the Town of Elmira:

Table G-9. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Elmira	2 Fire Stations, 3 Highway Department Shop, 1 Police Station, 6 Schools, 1 Water/Wastewater Facility

Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Elmira has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Elmira would be “Limited,” with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$367,757 having an approximate annual loss estimate of \$5,791 (Table G-10).

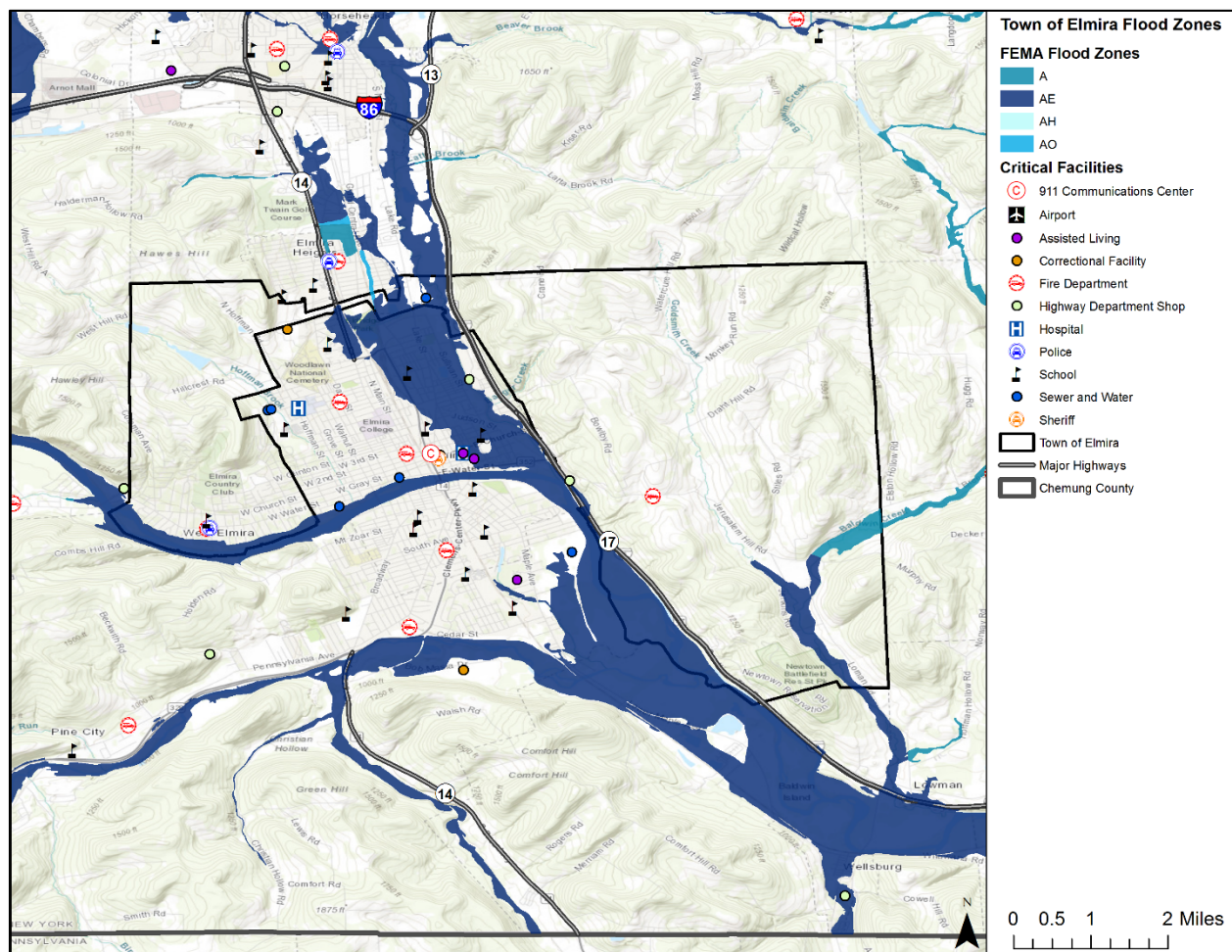
Table G-10. Potential Annualized Losses for the Town of Elmira

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Elmira	\$367,757	\$5,791

FLOOD

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. Full flood zone delineations with elevations are available in the Town of Elmira. The location of estimated flood zones for the Town of Elmira, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure G-2.

Figure G-2. Estimated Flood Zones in the Town of Elmira

HISTORICAL OCCURRENCES

Table G-11 depicts historical occurrences of flood events for the Town of Elmira according to the National Centers for Environmental Information (NCEI) data. From January 1996 to June 2018, 4 flood events were known to have impacted the Town of Elmira, based upon NCEI records. Flood events are often reported on a county-wide basis, or under-reported for individual municipalities, particularly in smaller communities.

Table G-11. Historical Flood Events, 1996-2018¹¹

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Elmira	8/30/2004	0	0	\$6,638	\$0
Town of Elmira	3/15/2007	0	0	\$6,126	\$0

¹¹ Values are in 2018 dollars. Events reported from January 1996 through June 2018.

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Elmira	9/7/2011	0	0	\$1,108,859	\$0
Town of Elmira	7/14/2015	0	0	\$105,420	\$0
Town of Elmira Totals		0	0	\$1,227,043	

Based on the list of historical flood events for the Town of Elmira, one of the reported events has occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Elmira can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Town of Elmira is highly likely.

VULNERABILITY AND IMPACT

Table G-12 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table G-12. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Town of Elmira	None

Historic loss estimates due to flood are presented in Table G-13 below.

Table G-13. Potential Annualized Losses, 1996-2018¹²

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Elmira	4	0	0	\$1,227,043	\$54,535

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table G-14 depicts the level of impact for the Town of Elmira.

¹² Events reported from January 1996 through June 2018.

Table G-14 Town of Elmira Impact

JURISDICTION	IMPACT	DESCRIPTION
Town of Elmira	Limited	The Town of Elmira could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Town of Elmira currently participates in the National Flood Insurance Program as well as the Community Rating System and has in place a flood damage prevention ordinance that includes standards above the minimum FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Town of Elmira has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Town of Elmira as a moderate risk hazard during hazard ranking activities at the Risk Assessment Workshop. Many of the mitigation actions for the jurisdiction were developed with flood mitigation in mind. The Town of Elmira has a designated floodplain administrator. The floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinances adopted by the Town of Elmira outlines the minimum requirements for development in special flood hazard areas. Table G-15 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table G-15. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Town of Elmira	N/A	06/12/2013	Good Standing	56

REPETITIVE LOSS

The Town of Elmira currently has no repetitive loss or severe repetitive loss properties.

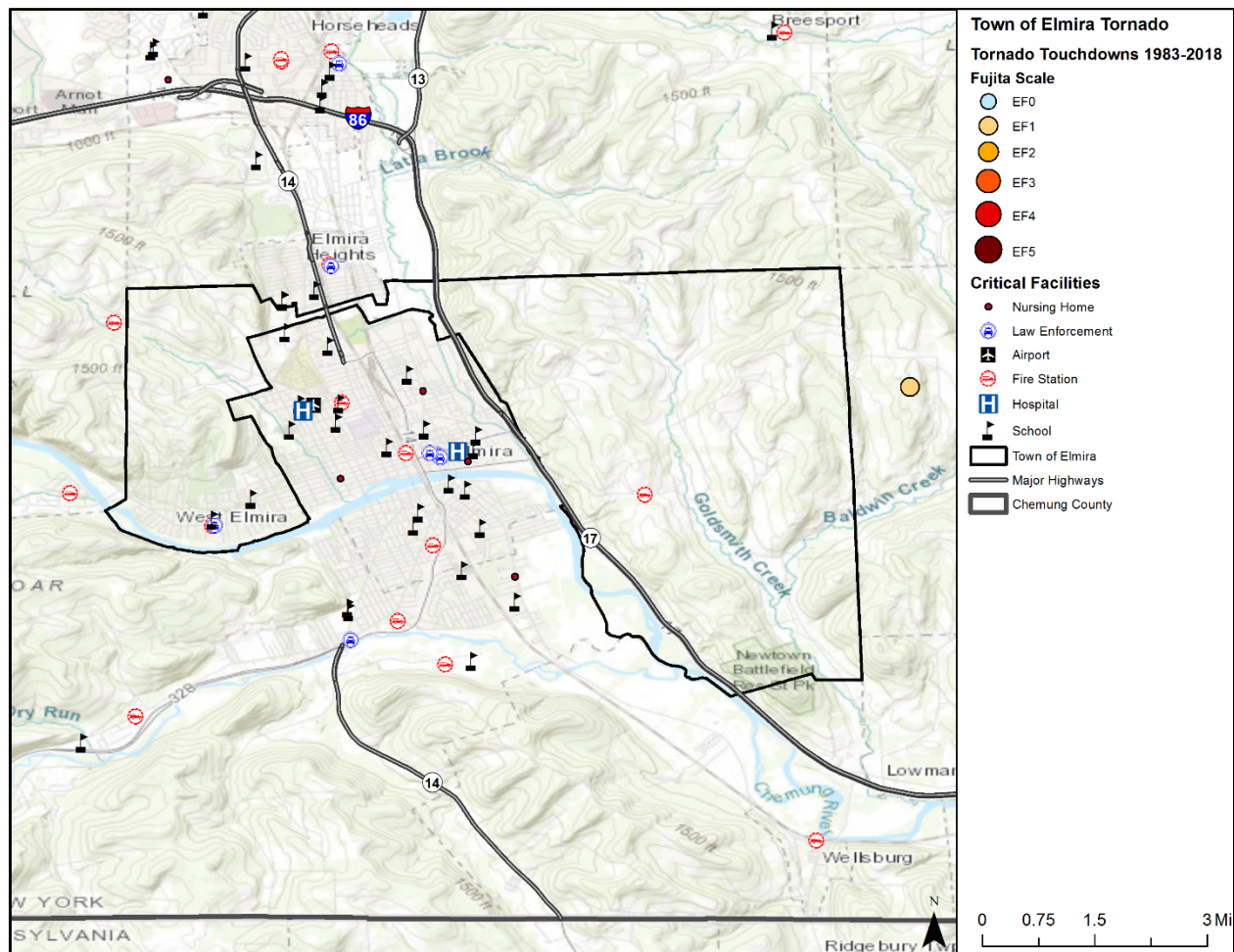
TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

Figure G-4 identifies the locations of previous occurrences in the Town of Elmira from January 1983 through June 2018. Table G-16 depicts historical occurrences of tornado events for the Town of Elmira according to the National Centers for Environmental Information (NCEI) data. From January 1983 to June 2018, 1 tornado event is known to have impacted, the Town of Elmira based upon NCEI records.

Figure G-4. Spatial Historical Tornado Events, 1983-2018**Table G-16. Historical Tornado Events, 1983-2018¹³¹⁴**

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Elmira	7/26/2012	3:00 PM	EF1	0	0	\$10,981,388	\$0
Town of Elmira Totals				0	0	\$10,981,388	

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Town of

¹³ Damages are reported from January 1983 through June 2018.

¹⁴ Magnitude is listed when available. Damage values are in 2018 dollars.

Elmira can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Town of Elmira is likely.

VULNERABILITY AND IMPACT

The Town of Elmira does not have any manufactured homes, the US Census data indicates a total of 90.6% (approximately 2,778 structures) of the residential structures in the Town of Elmira were built before 1980 (Table F-17). These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table G-17. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Elmira	0	2,778

The following critical facilities would be vulnerable to tornado events in the Town of Elmira:

Table G-18. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Elmira	2 Fire Stations, 3 Highway Department Shop, 1 Police Station, 6 Schools, 1 Water/Wastewater Facility

The average loss estimate of property and crop is \$10,981,388 (in 2018 dollars), having an approximate annual loss estimate of \$309,335 (Table G-19). Based on historic loss and damages, the impact of tornado on the Town of Elmira can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table G-19. Potential Annualized Losses, 1983-2018¹⁵

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Elmira	\$10,981,388	\$309,335

LANDSLIDE

The Town of the Elmira has no known areas susceptible or prone to landslide (Section 9). The Town of Elmira has no known historical occurrences of landslide and does not anticipate any landslide events in the future. The municipality has determined that this hazard is not a threat to their respective community and therefore does not require further analysis.

¹⁵ Events recorded from January 1983 through June 2018.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Upper Larchmont Detention Basin reclassification to high haz, new spillway project 2. Stabilization on Goldsmith and Baldwin Crks 3. Goldsmith Crk Draht Hill bridge to Jerusalem Hill Rd.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project 2 and 3 are complete. Project 1 is not complete. Action will be included in Plan Update.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Funding not secured. Action will be included in Plan Update.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the Stormwater Coalition and STC for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.
Flood -10	Conduct Regular Maintenance for Drainage System	Flood	Complete various construction and maintenance projects and create a schedule for ongoing maintenance of completed projects. 1. Stormwater system upgrade on Coleman Ave, to prevent flooding, joint project with Chemung County. 2. Joint project with C/Elmira to complete flood control project, Fassett Rd and Hoffman St, study is complete.	Cost	Staff time, materials and equipment
				Level of Protection	10-year storm
				Damages Avoided; Evidence of Success	Project 1 close to completion. Project 2 not funded and incomplete. Action will be included in Plan Update.
Flood -19	Improve Drainage System	Flood	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.	Cost	Up to \$2,000 annually
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.

NEW MITIGATION ACTIONS

Town of Elmira Upper Larchmont Dam Improvement		Town of Elmira – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The hazard classification of the Upper Larchmont Dam was increased to High-Hazard by the NYSDEC, requiring the size of the emergency spillway is to be increased (including re-designed and possibly relocated).		
Action or Project Intended for Implementation			
Description of the Solution	Increase size of emergency spillway.		
Is this Project related to a Critical Facility?		Yes	No
Level of Protection	500 yr. flood event	Estimated Benefits (losses avoided)	The hazard class of the Dam has been reclassified by NYSDEC. The project will bring Town into compliance with the new high-hazard classification.
Useful Life	100 years		
Estimated Cost	\$250,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	6 months	Potential Funding Sources	Hazard Mitigation Grant; general fund and in-kind for local share
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Redesign dam in new location	>\$750,000	Cost prohibitive and acquiring new location property would require agreement of property owners.
	Redesign current dam into two smaller dams with separate spillways	>\$750,000	Determining location of second spillway without impacting existing homes virtually impossible
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Town of Elmira Fern Dell Culvert Improvement		Town of Elmira – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Drainage system needs to be enlarged and/or modified to accommodate the peak stormwater flows of nearby Beecher Creek, mitigating the downstream flooding caused by this stream.		
Action or Project Intended for Implementation			
Description of the Solution	Enlargement and modification to Elmira's Fern Dell culvert.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	Up to 50 yr. flood event	Estimated Benefits (losses avoided)	Mitigation of residential flooding, damage to homes and private property.
Useful Life	100 years		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 years
Estimated Time Required for Project Implementation	2 months	Potential Funding Sources	Local funds
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Annual work plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Direct overflows from Fern Dell Culvert to an adjacent culvert, to increase overall capacity	\$10,000	An existing culvert adjacent to the Fern Dell culvert may be under-utilized and may have available capacity to accept overflows from Fern Dell culvert.
	Replace existing Fern Dell Culvert with a larger culvert	\$30,000	Construction for this alternative would be more costly and time consuming than currently considered project.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Automated Rain Gauges		Town of Elmira – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Heavy rain often occurs in the hills above the residential area of West Elmira, while the valley is getting little to no rain. The runoff causes unexpected flash flooding in the West Elmira neighborhoods due to debris blocking drainage structures.		
Action or Project Intended for Implementation			
Description of the Solution	Installing automated rain gauges near the headwaters of the two creeks that experience the most flooding would give Highway staff a warning that heavy rain is falling and would allow for response to problem areas before debris clogged the drainage structures. Can also connect these rain gauges to a regional gauge system that tracks precipitation and river levels in neighboring towns, allowing for improved situational awareness in any rain event.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10-year storm	Estimated Benefits (losses avoided)	Would allow for Town response to problem areas before significant flooding started to occur, reducing or preventing flood damage to private property and homes. Would share data with other agencies for situational awareness.
Useful Life	25 years		
Estimated Cost	\$7500		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	6 months	Potential Funding Sources	Grant funding, possible funding or in-kind assistance from Environmental Emergency Services (EES).
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Town and EES work plans
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Provide rain gauges & Train select residents to be rain gauge readers	\$1500.00	Would have to depend on residents to correctly install gauge, correctly read and report heavy rain amounts as they occur.
	Install only one gauge at a site that may serve all of residential area.	\$3750.00	Would not have as accurate data as two sites for entire residential area. Not a significant cost savings.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Town of Elmira – 4	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Buyout Damaged Properties		Town of Elmira – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Homes have sustained repetitive flood losses. The Town of Elmira has offered to assist the occupants with the buyout process. Will need to secure grant funding to proceed.		
Action or Project Intended for Implementation			
Description of the Solution	Buyout homes in the highest risk floodplain areas in order to relocate residents to safer locations, permanently eliminate the risk of repetitive damage to homes, and restore natural floodplain functions. The Town of Elmira will identify willing sellers, pursue grant funding, and assist with the buyout process.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	Reduce the damage to residential property and the disruption to life caused by repeated flooding.
Useful Life	60 years		
Estimated Cost	>\$1,000,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Continuing repetitive losses; Residents remain in harm's way; Emergency services required in high risk areas
	Relocate homes	>\$2,000,000	Less cost effective; Less feasible option due to age of structures
	Proposed Action	>\$1,000,000 (Depending on the number of willing participants)	Cost effective alternative; No residual risk
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Floodplain Management		Town of Elmira – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Drainage System Improvements		Town of Elmira – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Inadequate drainage systems along Coleman Avenue, Fassett Road and Hoffman Street cause flooding, damages to roadways, and create hazardous driving conditions for motorists.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade the stormwater system on Coleman Avenue, Fassett Road and Hoffman Street to prevent flooding		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10 yr. storm	Estimated Benefits (losses avoided)	Improved reliability for roadway; Improved safety for motorists.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Grants
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	Staff time	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Maintenance on the Old Chemung Canal Project		Town of Elmira - 8	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Chemung Canal joined the Chemung River, extending northward linking the river to the Erie Canal via Seneca Lake. The canal paralleled the Chemung River for long sections, sharing part of its water and drainage basin, by building dams and locks. The Canal has is no longer in use, but the remains are still in place. This area becomes paralyzed by the regional rains and flooding requiring maintenance.		
Action or Project Intended for Implementation			
Description of the Solution	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm	Estimated Benefits (losses avoided)	Continued maintenance of this program would result in
Useful Life	50 years		
Estimated Cost	\$2,000 per municipality		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Local funding sources
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Increases in debris and sediment will increase flood depths and damages
	Complete removal of the canal remnants and alternative drainage mitigation	\$50,000,000	Not cost effective; Significant Environmental concerns
	Proposed Project	\$2,000 per municipality	Cost effective; reduces future flood damages
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		Town of Elmira – 9	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Elmira Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	TOWN OF ELMIRA
Capital Improvements Plan	
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	x
Economic Development Plan	
Emergency Operations Plan	x
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	x
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	x
Real Estate Disclosure Requirements	
Site Plan Review Requirements	x
Stormwater Ordinance	x
Subdivision Regulations	x
Watershed Ordinance	

COMMUNITY CAPABILITY CHECKLIST	TOWN OF ELMIRA
Zoning Ordinance/Land Use Restrictions	
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	x
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	
Public Education/Awareness Programs	x
Stream Maintenance Program	x
Storm Drainage Systems Maintenance Program	x
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	x
Environmental Conservation Specialist	
Floodplain Administrator	x
GIS Specialist	
Personnel with Hazard Knowledge	x
Planner	
Public Information Official	
Resource Development/Grant Writer	

ANNEX H: VILLAGE OF ELMIRA HEIGHTS

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JURISDICTION PROFILE

OVERVIEW

The Village of Elmira Heights is located in Chemung County, New York, with a population just over 4,000. The village is primarily within the Town of Horseheads, but part of the village is in the Town of Elmira. The village is a northern suburb of the City of Elmira. It is part of the Elmira, New York Metropolitan Statistical Area. According to the United States Census Bureau, the village has a total area of 1.15 square miles, all of which is land. Newtown Creek, a tributary of the Chemung River, flows along the east side of the village, outside the village limits. Figure H-1 shows the general location of the Village of Elmira.

VILLAGE OF ELMIRA HEIGHTS CONTACT INFORMATION

Name: Margaret Smith

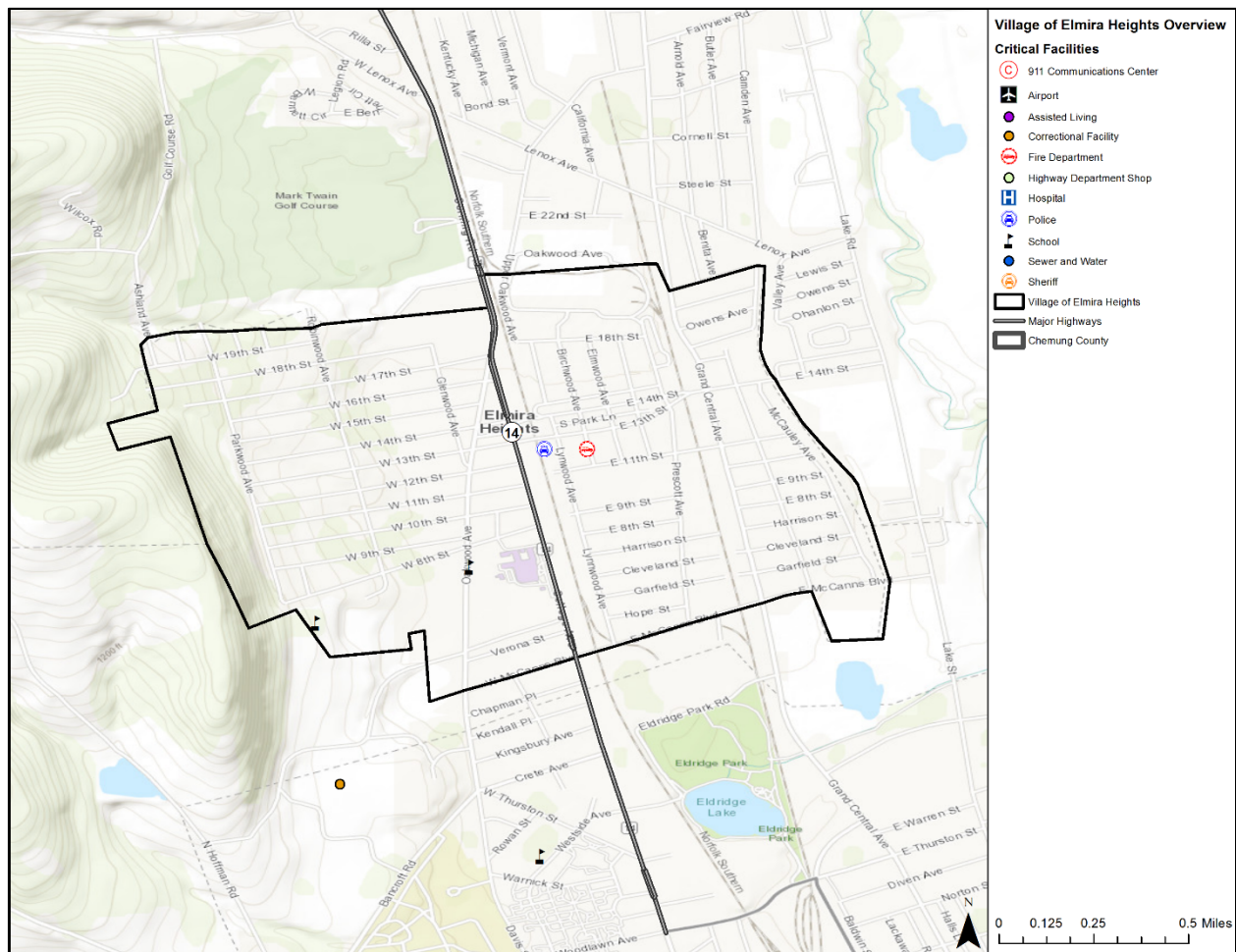
Title: Mayor/Supervisor

Phone: (607)734-7156

Address: 215 Elmwood Avenue, Elmira Heights,
NY 14903

Email: mayor.elmiraheights@gmail.com

Figure H-1. Village of Elmira Heights Planning Area



POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Village of Elmira Heights had a population of 4,097 residents. Table H-1 provides the population distribution within the Village of Elmira Heights.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table H-1. Population Distribution for the Village of Elmira Heights

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE ²	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Village of Elmira Heights	4,097	N/A	248	458

POPULATION GROWTH

The official 2010 Village of Elmira Heights population is 4,279. Overall, the Village of Elmira Heights experienced a decrease in population between 1980 and 2010 by 4.3%, or a decrease of 182 people. Table H-2 provides historic change rates in the Village of Elmira Heights.

Table H-2. Population for the Village of Elmira Heights, 1980-2010

JURISDICTION	1980 ³	1990 ⁴	2000 ⁵	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Village of Elmira Heights	4,279	4,359	4,170	4,097	-182	-4.3%	-73	-1.8%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Village of Elmira Heights might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table H-3, as provided Cornell University's Program on Applied Demographics⁶. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² Percentages are based on city and town populations only.

³ https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

⁴ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁵ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁶ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table H-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

HAZARD DESCRIPTION, LOCATION, EXTENT & HISTORICAL OCCURENCES

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Village of Elmira Heights, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Village of Elmira Heights experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Village of Elmira Heights is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Village of Elmira Heights are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Village of Elmira Heights:

Table H-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Village of Elmira Heights	1 Fire Station, 1 Highway Department Shop, 1 Police Station, 3 Schools

ANNEX H: VILLAGE OF ELMIRA HEIGHTS

Population over 65 in the Village of Elmira Heights is estimated at 14.8% of the total population or an estimated total of 577⁷ potentially vulnerable residents in the planning area based on age (Table H-5).

Table H-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Village of Elmira Heights	577

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table H-6 depicts historical occurrences of thunderstorm wind events for the Village of Elmira Heights according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 1 thunderstorm wind event is known to have impacted the Village of Elmira Heights, based upon NCEI records.

Table H-6. Historical Thunderstorm Wind Events, 1955-2018⁸⁹

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Elmira Heights	6/30/2013	5:30 PM	50	0	0	\$5,387	\$0
Village of Elmira Heights Totals				0	0	\$5,387	

Based on the list of historical thunderstorm wind events for the Village of Elmira Heights, the reported event occurred since the 2012 Plan.

HAIL

Historical evidence shown in Figure H-2 demonstrates that the Village of Elmira Heights is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Table H-7 depicts historical occurrences of hail events for the Village of Elmira Heights according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 2 hail events are known to have

⁷ US Census Bureau 2016 data for the Village of Elmira Heights.

⁸ Damages are reported from January 1955 through June 2018.

⁹ Magnitude is listed when available. Damage values are in 2018 dollars.

ANNEX H: VILLAGE OF ELMIRA HEIGHTS

impacted the Village of Elmira Heights, based upon NCEI records. Historical hail events are often provided on a county-wide basis in the NCEI database. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

Figure H-2. Historical Hail Events, 1955-2018

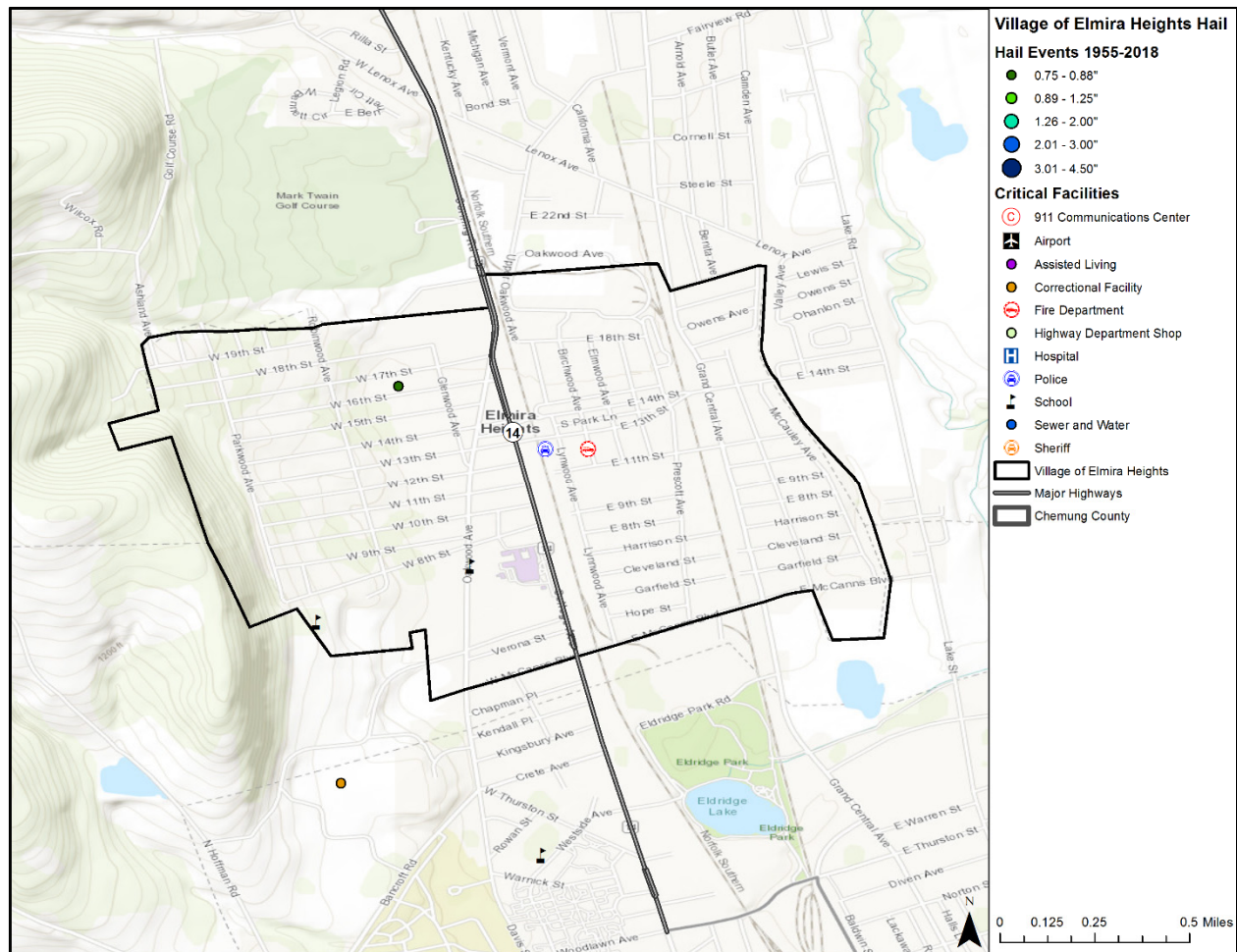


Table H-7. Historical Hail Events, 1955-2018¹⁰¹¹

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Elmira Heights	5/31/1998	3:40 PM	1.5	0	0	\$46,361	\$0
Village of Elmira Heights	7/9/2007	5:38 PM	0.75	0	0	\$0	\$0
Village of Elmira Heights Totals				0	0	\$46,361	

¹⁰ Damages are reported from January 1955 through June 2018.

¹¹ Magnitude is listed when available. Damage values are in 2018 dollars.

Based on the list of historical hail events for the Village of Elmira Heights, no reported events have occurred since the 2012 Plan.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the Village of Elmira Heights. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Village of Elmira Heights can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Village of Elmira Heights is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates that the Village of Elmira Heights has no manufactured homes located within the jurisdictional boundaries. The Village of Elmira Heights does feature an estimated 90.6% (approximately 1,610 structures) of existing residential structures that were built before 1980 (Table H-8). These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table H-8. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Village of Elmira Heights	0	1,610

The following critical facilities (Table H-9) would be vulnerable to thunderstorm events in the Village of Elmira Heights:

Table H-9. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Village of Elmira Heights	1 Fire Station, 1 Highway Department Shop, 1 Police Station, 3 Schools

Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Village of Elmira Heights has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Village of Elmira Heights would be "Limited," with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$51,748 having an approximate annual loss estimate of \$815 (Table H-10).

ANNEX H: VILLAGE OF ELMIRA HEIGHTS

Table H-10. Potential Annualized Losses for the Village of Elmira Heights

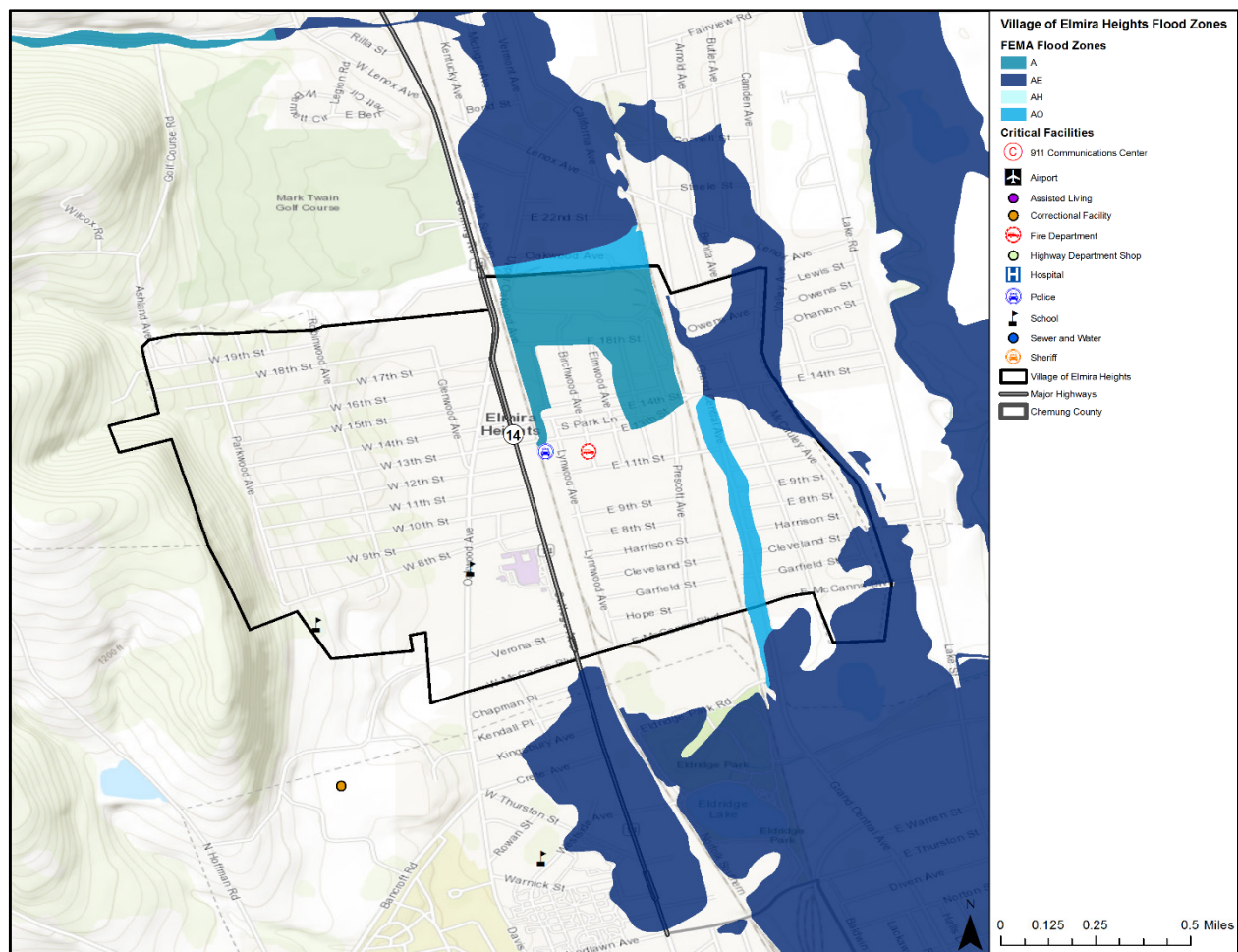
JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Elmira Heights	\$51,748	\$815

FLOOD

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. Full flood zone delineations with elevations are available in the Village of Elmira Heights. The location of estimated flood zones for the Village of Elmira Heights, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure H-3.

Figure H-3. Estimated Flood Zones in the Village of Elmira Heights



HISTORICAL OCCURRENCES

Table H-11 depicts historical occurrences of flood events for the Village of Elmira Heights according to the National Centers for Environmental Information (NCEI) data. From January 1996 to June 2018, 1 flood event was known to have impacted the Village of Elmira Heights, based upon NCEI records. Flood events are often reported on a county-wide basis, or under-reported for individual municipalities, particularly in small communities such as the Village of Elmira Heights.

Table H-11. Historical Flood Events, 1996-2018¹²

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Elmira Heights	6/25/2014	0	0	\$10,556	\$0
Village of Elmira Heights Totals		0	0	\$10,556	

Based on the list of historical flood events for the Village of Elmira Heights, the reported event occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Village of Elmira Heights can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Village of Elmira Heights is highly likely.

VULNERABILITY AND IMPACT

Table H-12 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table H-12. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Village of Elmira Heights	None

Historic loss estimates due to flood are presented in Table H-13 below.

¹² Values are in 2018 dollars. Events reported from January 1996 through June 2018.

Table H-13. Potential Annualized Losses, 1996-2018¹³

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Elmira Heights	1	0	0	\$10,556	\$469

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table H-14 depicts the level of impact for the Village of Elmira Heights.

Table H-14 Village of Elmira Heights Impact

JURISDICTION	IMPACT	DESCRIPTION
Village of Elmira Heights	Limited	The Village of Elmira Heights could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Village of Elmira Heights currently participates in the National Flood Insurance Program and is in good standing. The community has in place a flood damage prevention ordinance that includes standards that meet the minimum standard FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Village of Elmira Heights has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Village of Elmira Heights as a moderate risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. The Village of Elmira Heights has a designated floodplain administrator. The Elmira Heights floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the Village of Elmira Heights outlines the minimum requirements for development in special flood hazard areas. Table H-15 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table H-15. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Village of Elmira Heights	N/A	09/09/2015	Good Standing	49

¹³ Events reported from January 1996 through June 2018.

REPETITIVE LOSS

Table H-16 shows repetitive loss and severe repetitive loss properties for the Village of Elmira Heights.

Table H-16. Repetitive Loss and Severe Repetitive Loss Properties

JURISDICTION	BUILDING TYPE	NUMBER OF STRUCTURES	NUMBER OF LOSSES
Village of Elmira Heights	Single Family	3	6

TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of tornado events for the Village of Elmira Heights. Historical tornado events are often provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities, such as the Village of Elmira Heights, are impacted. Tornado events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Village of Elmira Heights can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Village of Elmira Heights is likely.

VULNERABILITY AND IMPACT

The US Census data indicates that the Village of Elmira Heights has no manufactured homes located within the jurisdictional boundaries. The Village of Elmira Heights does feature an estimated 90.6% (approximately 1,610 structures) of existing residential structures that were built before 1980 (Table H-17). These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table H-17. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Village of Elmira Heights	0	1,610

The following critical facilities would be vulnerable to tornado events in the Village of Elmira Heights:

Table H-18. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Village of Elmira Heights	1 Fire Station, 1 Highway Department Shop, 1 Police Station, 3 Schools

The average loss estimate of property and crop is \$0 (in 2018 dollars), having an approximate annual loss estimate of \$0 (Table H-19). Based on historic loss and damages, the impact of tornado on the Village of Elmira Heights can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table H-19. Potential Annualized Losses, 1983-2018¹⁴

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Elmira Heights	\$0	\$0

LANDSLIDE

The Village of Elmira Heights has no known areas susceptible or prone to landslide (Section 9). The Village has no known historical occurrences of landslide and does not anticipate any landslide events in the future. The municipality determined that this hazard is not a threat to the village and therefore does not require further analysis.

¹⁴ Events recorded from January 1983 through June 2018.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood-9	Floodplain Management	Flood	Provide technical assistance through the stormwater Coalition and STC for more effective municipal legislation regarding land use, zoning laws, Stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.
Flood-13	Protect Infrastructure	Flood	Investigate funding sources to complete proposed drainage control projects in the Village of Elmira Heights, and investigate possible alternatives or improvements to current system, such as installing an automated system for existing manual pumps.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Rehabilitated pumps. Still pursuing upgrading. Action will be included in Plan Update.
Flood -19	Improve Drainage System	Flood	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.	Cost	Up to \$2,000 annually
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.

NEW MITIGATION ACTIONS

Oakwood Ave Drainage Project		Village of Elmira Heights – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	When there is rain, ponding occurs in a topographic sag portion of Oakwood Avenue due to the lack of a stormwater collection system. It floods so bad that barricades need to be placed and prevent vehicles and emergency vehicles from going through the high water, making traffic divert to an alternate route. This is the main route for ambulances to get to the hospital.		
Action or Project Intended for Implementation			
Description of the Solution	A stormwater collection system would be installed that would convey stormwater from the sag in Oakwood Avenue to the existing stormwater detention basin on the Elementary School property. A flap gate valve and a knife gate valve may be needed, as part of the system.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	10-year storm	Estimated Benefits (losses avoided)	To collect and convey stormwater within Oakwood Avenue to reduce hazards for motorists, prevent traffic delays, and allow emergency vehicles access to the community and hospital.
Useful Life	50 Years		
Estimated Cost	\$20,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	All Federal, State, Local Funding HMGP, PDM, FMA, and chips
Responsible Organization	Village of Elmira Heights	Local Planning Mechanisms to be Used in Implementation, if any	Plan by Soil & Water District engineer
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Larger drywells	>\$25,000	There are multiples utilities that will have to be moved. Also, soils do not appear to be highly permeable.
	Allow stormwater to drain directly into the sanitary sewer	\$2000	This would not be in compliance with Chemung County Sewer District requirements
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX H: VILLAGE OF ELMIRA HEIGHTS

Upgrade / Retrofit of Existing Stormwater Pump Stations		Village of Elmira Heights – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Village owns and maintains three stormwater pump stations. The College Ave. pump station must be manually activated. For the 13 th Street pump station and the McCanns Blvd pump station, upgrade/retrofit of the pumps and electrical systems are needed, as well as emergency generators needed for each of these stations.		
Action or Project Intended for Implementation			
Description of the Solution	Installation of automatic controls for the College Ave. pump station. Rehabilitation/replacement of the pumps and electrical systems and installation of electric generators with hardwired quick connections for the 13 th Street and McCanns Blvd pump stations.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm	Estimated Benefits (losses avoided)	Would control the storm run off for several major roadways through the village. Would allow emergency vehicles access through areas that usually flood, including main route to Hospital.
Useful Life	50 Years		
Estimated Cost	\$700,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	All Federal, State, Local Funding HMGP, PDM FMA And chips
Responsible Organization	Village of Elmira Heights	Local Planning Mechanisms to be Used in Implementation, if any	Local improvements plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Installation of a high-water alarm that will sound to alert that pumps need to be turned on for College Ave. station.	\$10,000	Without automatic controls, flooding may occur before the pumps can be turned on.
	Allow stormwater to overflow/drain into the sanitary sewer system	\$10,000	This would not comply with Chemung County Sewer District requirements
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX H: VILLAGE OF ELMIRA HEIGHTS

Rehabilitation to Existing Stormwater Detention Basin to West of 17 th Street Area		Village of Elmira Heights – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The 17 th Street stormwater detention basin is in need of rehabilitation including the removal of woody growth from the embankment, stabilization of emergency spillway, and the replacement of the principle spillway conduit system. This existing stormwater detention basin receives runoff from a 63-acre watershed on the hillside above the west end of 17 th Street. This detention basin reduces peak stormwater flow rates and protects the downstream intensely developed area of the Village.		
Action or Project Intended for Implementation			
Description of the Solution	Improvements would be completed to the existing detention basin to remove woody growth from the basin embankment; revegetate the basin embankment; stabilization/widening of the emergency spillway; and the replacement of the existing principle spillway conduit system.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-Year Storm	Estimated Benefits (losses avoided)	Completion of the rehabilitation of the basin would allow with continued protection of the downstream community with increased reliability and performance.
Useful Life	75 years		
Estimated Cost	\$250,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 Years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grant funding; Possible state and local funding
Responsible Organization	Village of Elmira Heights	Local Planning Mechanisms to be Used in Implementation, if any	Local improvements plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Decommissioning of 17 th Street Stormwater Detention Basin	\$200,000	Increased flooding risk for downstream development. Increased flow rates to NYS Route 14, which may be unacceptable.
	Replacing downstream storm sewers with larger sewers to increase hydraulic capacity of system	>\$1,250,000	Costly project. Also, improvements to the existing detention basin at the Elementary School may be needed. Possibility of increased flows to NYS Route 14.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Village of Elmira Heights – 4	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Village of Elmira Heights	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX H: VILLAGE OF ELMIRA HEIGHTS

Floodplain Management		Village of Elmira Heights – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Village of Elmira	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX H: VILLAGE OF ELMIRA HEIGHTS

Maintenance on the Old Chemung Canal Project		Village of Elmira Heights – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Chemung Canal joined the Chemung River, extending northward linking the river to the Erie Canal via Seneca Lake. The canal paralleled the Chemung River for long sections, sharing part of its water and drainage basin, by building dams and locks. The Canal has is no longer in use, but the remains are still in place. This area becomes paralyzed by the regional rains and flooding requiring maintenance.		
Action or Project Intended for Implementation			
Description of the Solution	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm	Estimated Benefits (losses avoided)	Continued maintenance of this program would result in
Useful Life	50 years		
Estimated Cost	\$2,000 per municipality		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Local funding sources
Responsible Organization	Village of Elmira Heights	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Increases in debris and sediment will increase flood depths and damages
	Complete removal of the canal remnants and alternative drainage mitigation	\$50,000,000	Not cost effective; Significant Environmental concerns
	Proposed Project	\$2,000 per municipality	Cost effective; reduces future flood damages
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX H: VILLAGE OF ELMIRA HEIGHTS

Flood Study and Mapping		Village of Elmira Heights – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Village of Elmira Heights Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Village of Elmira Heights	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	VILLAGE OF ELMIRA HEIGHTS
Capital Improvements Plan	
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	x
Economic Development Plan	
Emergency Operations Plan	x
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	x
Real Estate Disclosure Requirements	
Site Plan Review Requirements	x
Stormwater Ordinance	x
Subdivision Regulations	x
Watershed Ordinance	

ANNEX H: VILLAGE OF ELMIRA HEIGHTS

COMMUNITY CAPABILITY CHECKLIST	VILLAGE OF ELMIRA HEIGHTS
Zoning Ordinance/Land Use Restrictions	x
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	x
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	
Public Education/Awareness Programs	
Stream Maintenance Program	x
Storm Drainage Systems Maintenance Program	
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	x
Environmental Conservation Specialist	x
Floodplain Administrator	x
GIS Specialist	x
Personnel with Hazard Knowledge	x
Planner	x
Public Information Official	x
Resource Development/Grant Writer	

ANNEX I: TOWN OF ERIN

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JURISDICTION PROFILE

OVERVIEW

The Town of Erin is located in Chemung County, New York, with a population just under 2,000. The town is east of Elmira and is along the county's northern border. It is part of the Elmira Metropolitan Statistical Area. According to the United States Census Bureau, the town has a total area of 44.5 square miles, of which 44.2 square miles is land and 0.3 square miles, or 0.5%, is water. Newtown Creek, a tributary of the Chemung River, flows westward through the town. The north town line is the border of Schuyler County. Figure I-1 shows the general location of the Town of Erin.

TOWN OF ERIN CONTACT INFORMATION

Name: Dawn Schmidt

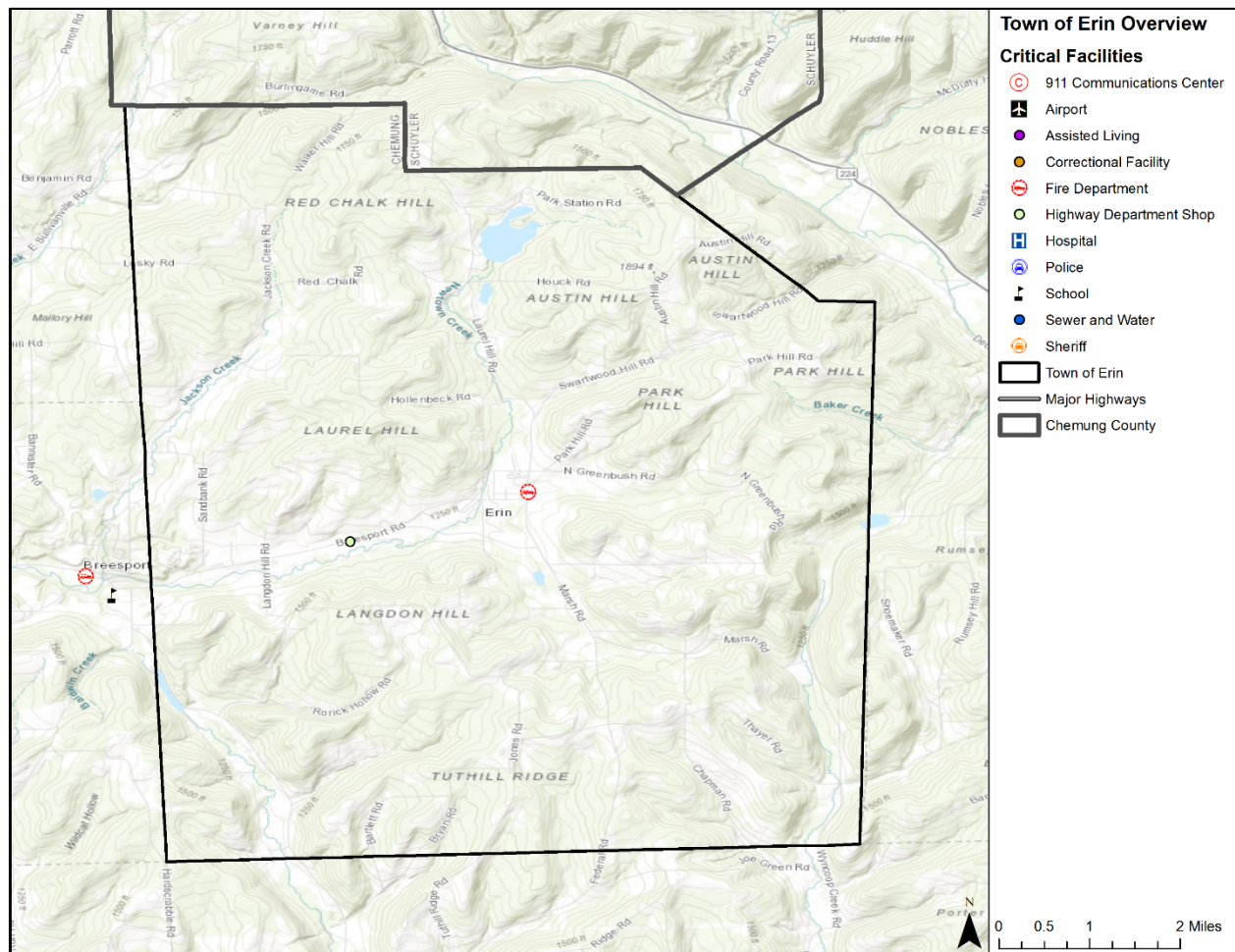
Title: Mayor/Supervisor

Phone: (607)739-8681 x3

Address: 1138 Breesport Road, Erin, NY 14838

Email: etownclerk@stny.rr.com

Figure I-1. Town of Erin Planning Area



POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Town of Erin had a population of 1,962 residents. Table I-1 provides the population distribution within the Town of Erin.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table I-1. Population Distribution for the Town of Erin

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Erin	1,962	2.2%	288	196

POPULATION GROWTH

The official 2010 Town of Erin population is 1,962. Overall, the Town of Erin experienced a decrease in population between 1980 and 2010 by 3.7%, or a decrease of 75 people. Table I-2 provides historic change rates in the Town of Erin.

Table I-2. Population for the Town of Erin, 1980-2010

JURISDICTION	1980 ²	1990 ³	2000 ⁴	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Town of Erin	2,037	2,002	2,054	1,962	-75	-3.7%	-92	-4.5%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Town of Erin might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table I-3, as provided Cornell University's Program on Applied Demographics⁵. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

³ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁴ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁵ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table I-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

HAZARD DESCRIPTION, LOCATION, EXTENT & HISTORICAL OCCURENCES

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Town of Erin, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Town of Erin experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Town of Erin is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Town of Erin are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Town of Erin:

Table I-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Erin	1 Fire Station, 1 Highway Department Shop

Population over 65 in the Town of Erin is estimated at 15.0% of the total population or an estimated total of 299⁶ potentially vulnerable residents in the planning area based on age (Table I-5).

⁶ US Census Bureau 2016 data for the Town of Erin.

Table I-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Town of Erin	299

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table I-6 depicts historical occurrences of thunderstorm wind events for the Town of Erin according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 5 thunderstorm wind events are known to have impacted the Town of Erin, based upon NCEI records.

Table I-6. Historical Thunderstorm Wind Events, 1955-2018⁷⁸

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Erin	7/6/1995	2:40 PM	Unknown	0	0	\$4,949	\$0
Town of Erin	5/29/1998	2:05 PM	Unknown	0	0	\$61,815	\$0
Town of Erin	6/26/2002	6:55 PM	50	0	0	\$4,195	\$0
Town of Erin	5/29/2012	1:45 PM	50	0	0	\$2,189	\$0
Town of Erin	7/13/2014	4:25 PM	50	0	0	\$10,560	\$0
Town of Erin Totals				0	0	\$83,709	

Based on the list of historical thunderstorm wind events for the Town of Erin, two of the reported events occurred since the 2012 Plan.

⁷ Damages are reported from January 1955 through June 2018.

⁸ Magnitude is listed when available. Damage values are in 2018 dollars.

HAIL

Historical evidence shown in Figure I-2 demonstrates that the Town of Erin is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Table I-7 depicts historical occurrences of hail events for the Town of Erin according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 4 hail events are known to have impacted the Town of Erin, based upon NCEI records. Historical hail events are often provided on a county-wide basis in the NCEI database. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

Figure I-2. Historical Hail Events, 1955-2018

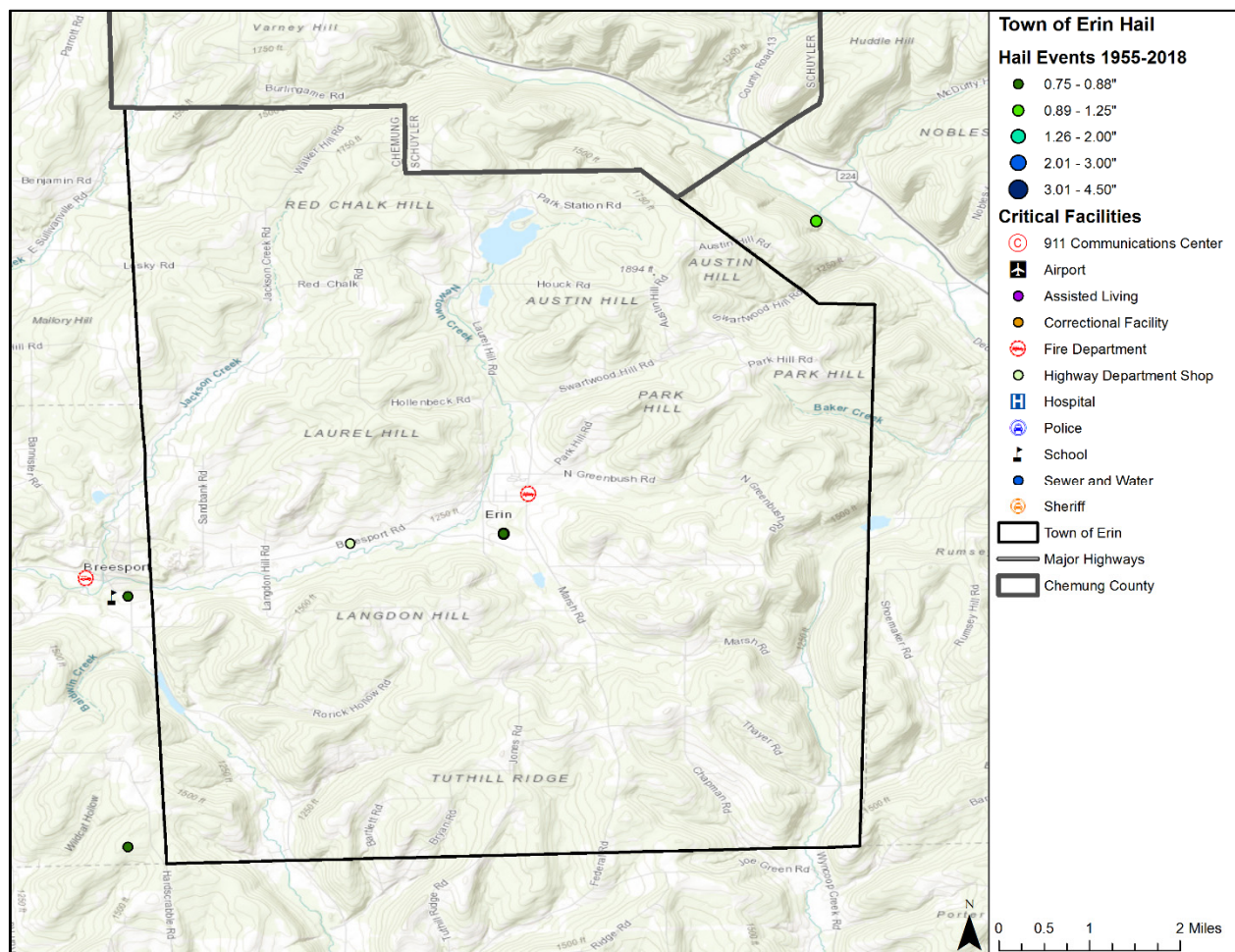


Table I-7. Historical Hail Events, 1955-2018⁹¹⁰

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Erin	6/26/2002	6:55 PM	0.75	0	0	\$0	\$0
Town of Erin	5/24/2004	8:00 AM	0.75	0	0	\$0	\$0
Town of Erin	7/26/2008	5:24 PM	1.0	0	0	\$0	\$0
Town of Erin	6/26/2009	11:59 AM	0.88	0	0	\$0	\$0
Town of Erin Totals				0	0	\$0	

Based on the list of historical hail events for the Town of Erin, no reported events have occurred since the 2012 Plan.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the Town of Erin. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Erin can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Town of Erin is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 293 manufactured homes (approximately 32.4%) located in the Town of Erin (Table I-8). In addition, 54.5% (approximately 493 structures) of the residential structures in the Town of Erin were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

⁹ Damages are reported from January 1955 through June 2018.

¹⁰ Magnitude is listed when available. Damage values are in 2018 dollars.

Table I-8. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Erin	293	493

The following critical facilities (Table I-9) would be vulnerable to thunderstorm events in the Town of Erin:

Table I-9. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Erin	1 Fire Station, 1 Highway Department Shop

Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Erin has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Erin would be "Limited," with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$83,709 having an approximate annual loss estimate of \$1,318 (Table I-10).

Table I-10. Potential Annualized Losses for the Town of Erin

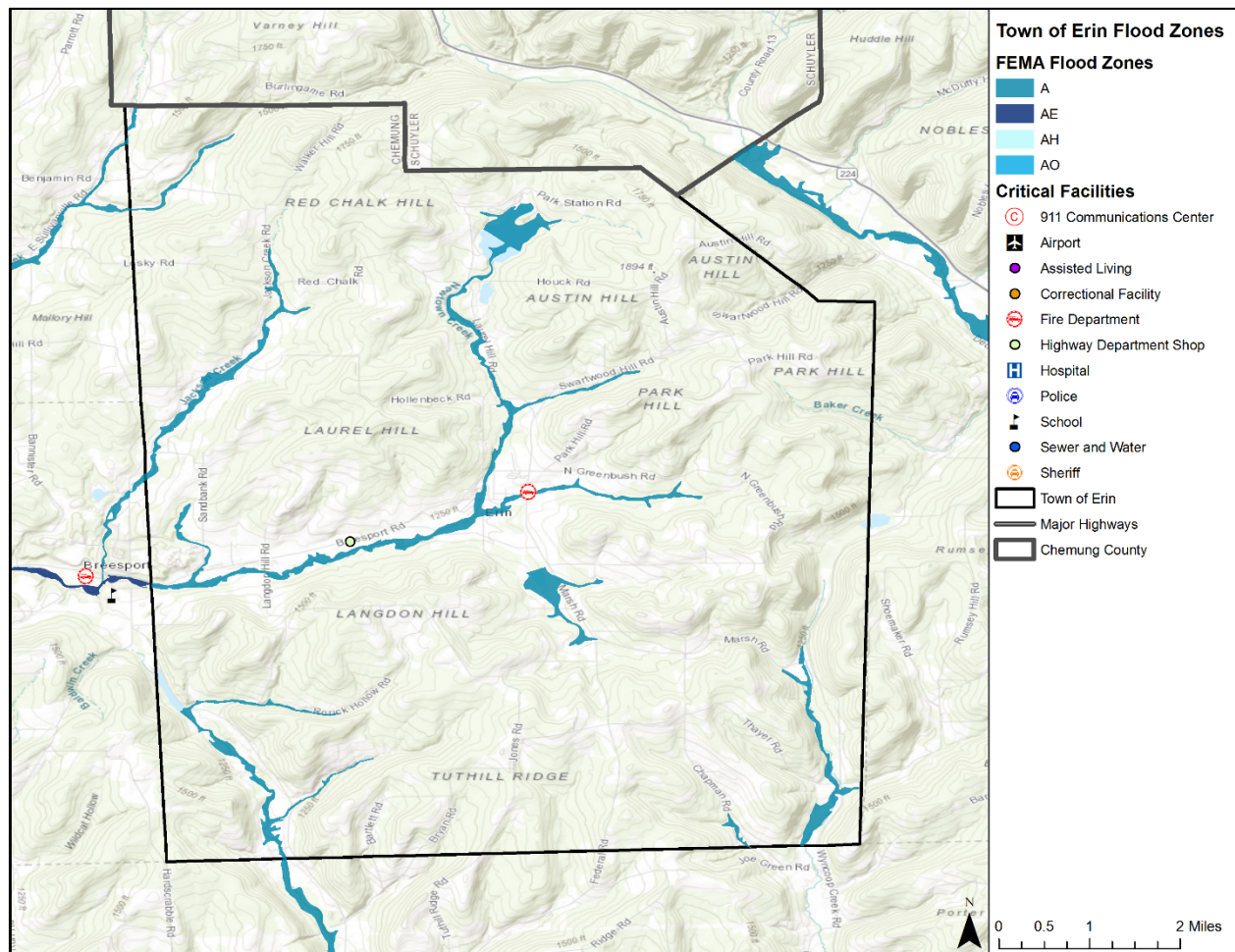
JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Erin	\$83,709	\$1,318

FLOOD

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. A limited flood hazard boundary map with no elevations is available in the Town of Erin. The location of estimated flood zones for the Town of Erin, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure I-3.

Figure I-3. Estimated Flood Zones in the Town of Erin



HISTORICAL OCCURRENCES

Table I-11 depicts historical occurrences of flood events for the Town of Erin according to the National Centers for Environmental Information (NCEI) data. From January 1996 to June 2018, 1 flood event was known to have impacted the Town of Erin, based upon NCEI records. Flood events are often reported on a county-wide basis, or under-reported for individual municipalities, particularly in small communities such as the Town of Erin.

Table I-11. Historical Flood Events, 1996-2018¹¹

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Erin	7/7/2004	0	0	\$6,642	\$0
Town of Erin Totals		0	0	\$6,642	

Based on the list of historical flood events for the Town of Erin, no reported events occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Erin can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Town of Erin is highly likely.

VULNERABILITY AND IMPACT

Table I-12 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table I-12. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Town of Erin	None

Historic loss estimates due to flood are presented in Table I-13 below.

Table I-13. Potential Annualized Losses, 1996-2018¹²

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Erin	1	0	0	\$6,642	\$295

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table I-14 depicts the level of impact for the Town of Erin.

¹¹ Values are in 2018 dollars. Events reported from January 1996 through June 2018.

¹² Events reported from January 1996 through June 2018.

Table I-14 Town of Erin Impact

JURISDICTION	IMPACT	DESCRIPTION
Town of Erin	Limited	The Town of Erin could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Town of Erin currently participates in the National Flood Insurance Program and is in good standing. The community has in place a flood damage prevention ordinance that includes standards that meet the minimum standard FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Town of Erin has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Town of Erin as a low risk hazard during hazard ranking activities at the Risk Assessment Workshop. However, many of the mitigation actions were developed with flood mitigation in mind. The Town of Erin has a designated floodplain administrator. The Erin floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the Town of Erin outlines the minimum requirements for development in special flood hazard areas. Table I-15 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table I-15. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Town of Erin	07/08/1992	05/07/2012	Good Standing	7

REPETITIVE LOSS

The Town of Erin currently has no repetitive loss or severe repetitive loss properties.

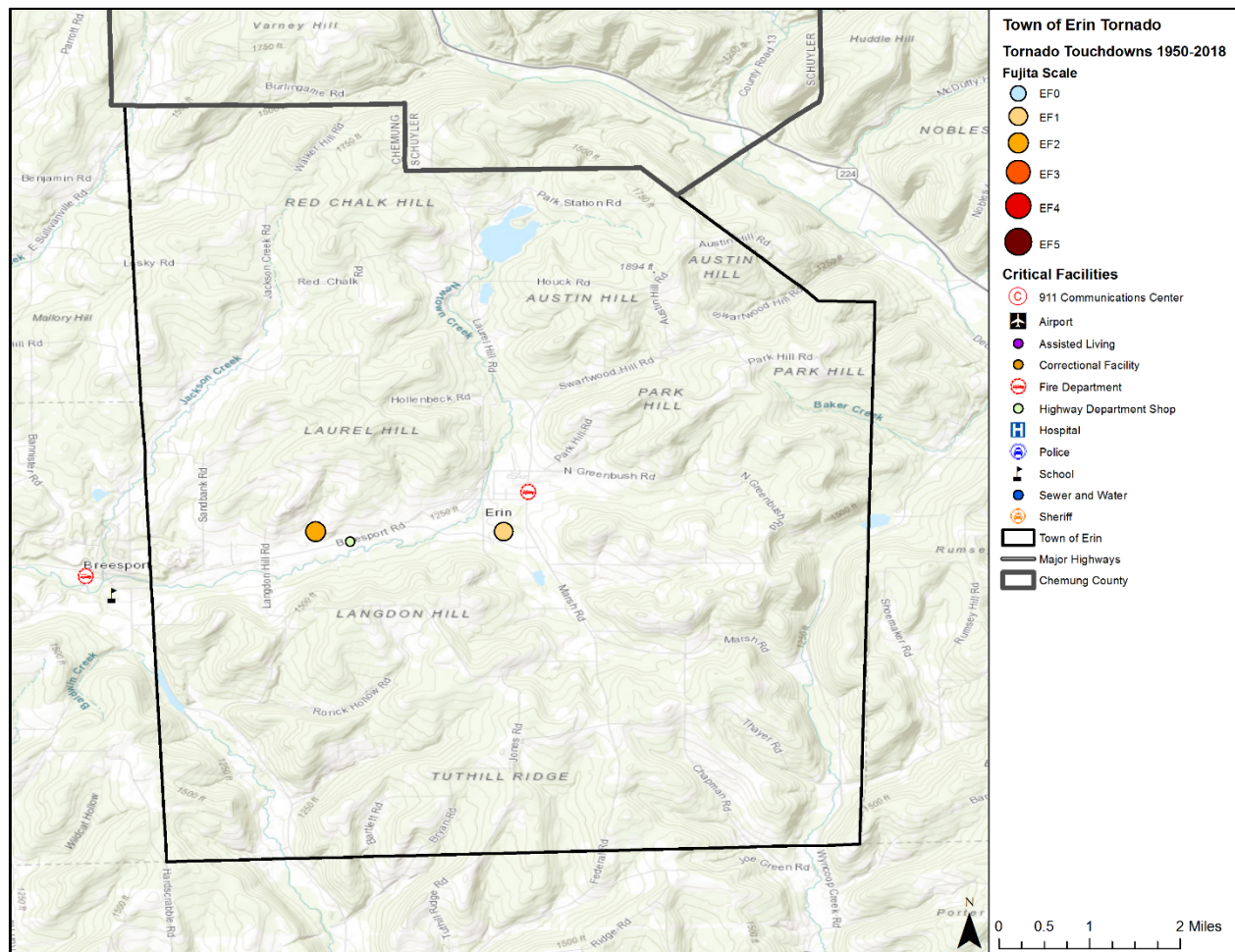
TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

Figure I-4 identifies the locations of previous occurrences in the Town of Erin from January 1983 through June 2018. Table I-16 depicts historical occurrences of tornado events for the Town of Erin according to the National Centers for Environmental Information (NCEI) data. From January 1983 to June 2018, 2 tornado events are known to have impacted the Town of Erin, based upon NCEI records.

Figure I-4. Spatial Historical Tornado Events, 1983-2018**Table I-16. Historical Tornado Events, 1983-2018^{13,14}**

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Erin	11/16/2006	2:50 PM	F1	0	0	\$12,486	\$0
Town of Erin	4/28/2011	12:23 AM	EF2	0	0	\$643,216	\$0
Town of Erin Totals				0	0	\$655,702	

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level

¹³ Damages are reported from January 1983 through June 2018.

¹⁴ Magnitude is listed when available. Damage values are in 2018 dollars.

events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Town of Erin can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Town of Erin is likely.

VULNERABILITY AND IMPACT

The U.S. Census data indicates a total of 293 manufactured homes (Table I-17) located in the Town of Erin (32.4% of housing units). In addition, 54.5% (approximately 493 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table I-17. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Erin	293	493

The following critical facilities would be vulnerable to tornado events in the Town of Erin:

Table I-18. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Erin	1 Fire Station, 1 Highway Department Shop

The average loss estimate of property and crop is \$655,702 (in 2018 dollars), having an approximate annual loss estimate of \$18,740 (Table I-19). Based on historic loss and damages, the impact of tornado on the Town of Erin can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table I-19. Potential Annualized Losses, 1983-2018¹⁵

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Erin	\$655,702	\$18,740

LANDSLIDE

The Town of Erin has no known areas susceptible or prone to landslide (Section 9). The Town of Erin has no known historical occurrences of landslide and does not anticipate any landslide events in the future. The municipality determined that this hazard is not a threat to the township and therefore does not require further analysis.

¹⁵ Events recorded from January 1983 through June 2018.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Diversion swale to protect Fire Dept. 2. T/Erin line to Rt. 223 bridge in Erin Hamlet 3. Erin Hamlet upstream to first bridge.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Projects 1 and 2 are complete. Project 3 is unnecessary. Action will be deleted.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Funding not secured. Action will be included in Plan Update.
Flood-11a	Improve Drainage System	Flood	Upgrade all dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project is partially completed. Action will be included in Plan Update.

NEW MITIGATION ACTIONS

Chapman Road Stream Stabilization & Sediment Basin		Town of Erin – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excessive erosion within the upper portions of the stream along Chapman Road results in excessive sediment being deposited in the lower portions of this stream near Chapman Road, resulting in the diversion of flows from the stream to the travel lanes of Chapman Road.		
Action or Project Intended for Implementation			
Description of the Solution	The stream along Chapman Road shall be stabilized with dimensional rock rip rap to reduce streambank erosion. In addition, a sediment basin shall be installed on this stream, to allow sediment to accumulate in a location where equipment can readily access to remove this sediment.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year	Estimated Benefits (losses avoided)	Improved hydraulic capacity; Reduction in sediment build-up issues; Improved reliability for roadway; Improved safety for motorists; Improved aquatic habitat of stream
Useful Life	50 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources
Responsible Organization	Town of Erin	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Unacceptable flood overtopping frequency
	Abandonment of Chapman Road	\$20,000	Unacceptable inconvenience to homeowners & traveling public; unacceptable delays for emergency vehicles
	Replacement of stream with large box culvert	>\$2,000,000	Excessive project costs
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Rorick Hollow Road Culvert Replacement Project		Town of Erin – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Three sets of twin culverts along Rorick Hollow Road are prone to clogging and may also be undersized, resulting in the frequent overflowing of these culverts with these overflows crossing the public thoroughfare.		
Action or Project Intended for Implementation			
Description of the Solution	The three sets of existing twin culverts shall be replaced with larger culverts. Furthermore, the alignment of the entrances of the culverts shall be staggered and spaced to help alleviate the historic debris build-up.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year	Estimated Benefits (losses avoided)	Improved hydraulic capacity; Reduction in debris build-up issues; Improved reliability for roadway; Improved safety for motorists
Useful Life	50 years		
Estimated Cost	\$300,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources
Responsible Organization	Town of Erin	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Unacceptable flooding overtopping frequency
	Abandonment of Rorick Hollow Road	\$20,000	Unacceptable inconvenience to homeowners & traveling public; unacceptable delays for emergency vehicles
	Replacement with large box culverts	>\$600,000	High project costs
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Town of Erin – 3	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Erin	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$50,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Buyout Damaged Properties		Town of Erin – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Homes have sustained repetitive flood losses. The Town of Erin has offered to assist the occupants with the buyout process. Will need to secure grant funding to proceed.		
Action or Project Intended for Implementation			
Description of the Solution	Buyout homes in the highest risk floodplain areas in order to relocate residents to safer locations, permanently eliminate the risk of repetitive damage to homes, and restore natural floodplain functions. The Town of Erin will identify willing sellers, pursue grant funding, and assist with the buyout process.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	Reduce the damage to residential property and the disruption to life caused by repeated flooding.
Useful Life	60 years		
Estimated Cost	>\$1,000,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Erin	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Continuing repetitive losses; Residents remain in harm's way; Emergency services required in high risk areas
	Relocate homes	>\$2,000,000	Less cost effective; Less feasible option due to age of structures
	Proposed Action	>\$1,000,000 (Depending on the number of willing participants)	Cost effective alternative; No residual risk
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Dirt Road Upgrades		Town of Erin – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excessive rain causes dirt roads to turn into mud soup and can cause ditches to overflow. Road improvements are needed.		
Action or Project Intended for Implementation			
Description of the Solution	Upgrade dirt roads to at least oil and stone and install proper drainage structures to prevent future flood damage.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year	Estimated Benefits (losses avoided)	Improved hydraulic capacity; Reduction in sediment build-up issues; Improved reliability for roadway; Improved safety for motorists; Improved aquatic habitat of stream
Useful Life	50 years		
Estimated Cost	\$150,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources
Responsible Organization	Town of Erin	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; damages will continue; Emergency services will be required during flood events
	Elevate Roadways	\$1,000,000	Not considered cost effective; May not entirely prevent flooding of roadway
	Proposed Action	\$150,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		Town of Erin – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Erin Flood Insurance Rate Maps were developed from a limited flood study and currently have no base flood elevations. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Erin	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	TOWN OF ERIN
Capital Improvements Plan	
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	x
Economic Development Plan	
Emergency Operations Plan	x
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	x
Real Estate Disclosure Requirements	
Site Plan Review Requirements	x
Stormwater Ordinance	x
Subdivision Regulations	x
Watershed Ordinance	

COMMUNITY CAPABILITY CHECKLIST	TOWN OF ERIN
Zoning Ordinance/Land Use Restrictions	x
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	x
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	
Public Education/Awareness Programs	
Stream Maintenance Program	x
Storm Drainage Systems Maintenance Program	
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	x
Environmental Conservation Specialist	x
Floodplain Administrator	x
GIS Specialist	x
Personnel with Hazard Knowledge	x
Planner	x
Public Information Official	x
Resource Development/Grant Writer	

ANNEX J: TOWN OF HORSEHEADS

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JURISDICTION PROFILE

OVERVIEW

The Town of Horseheads is located in Chemung County, New York, with a population just under 20,000. The name of the town is derived from the number of bleached horses' skulls once found there. Horseheads is north of the City of Elmira, upon which it borders. There is a village named Horseheads within the town. It is part of the Elmira Metropolitan Statistical Area. According to the United States Census Bureau, the town has a total area of 35.9 square miles, of which 35.6 square miles is land and 0.3 square miles, or 0.87%, is water. Newtown Creek, a tributary of the Chemung River, flows west then south through the center of the town. Figure J-1 shows the general location of the Town of Horseheads.

TOWN OF HORSEHEADS CONTACT INFORMATION

Name: Mike Edwards

Title: Mayor/Supervisor

Phone: (607)737-2095

Address: 150 Wygant Road, Horseheads, NY
14845

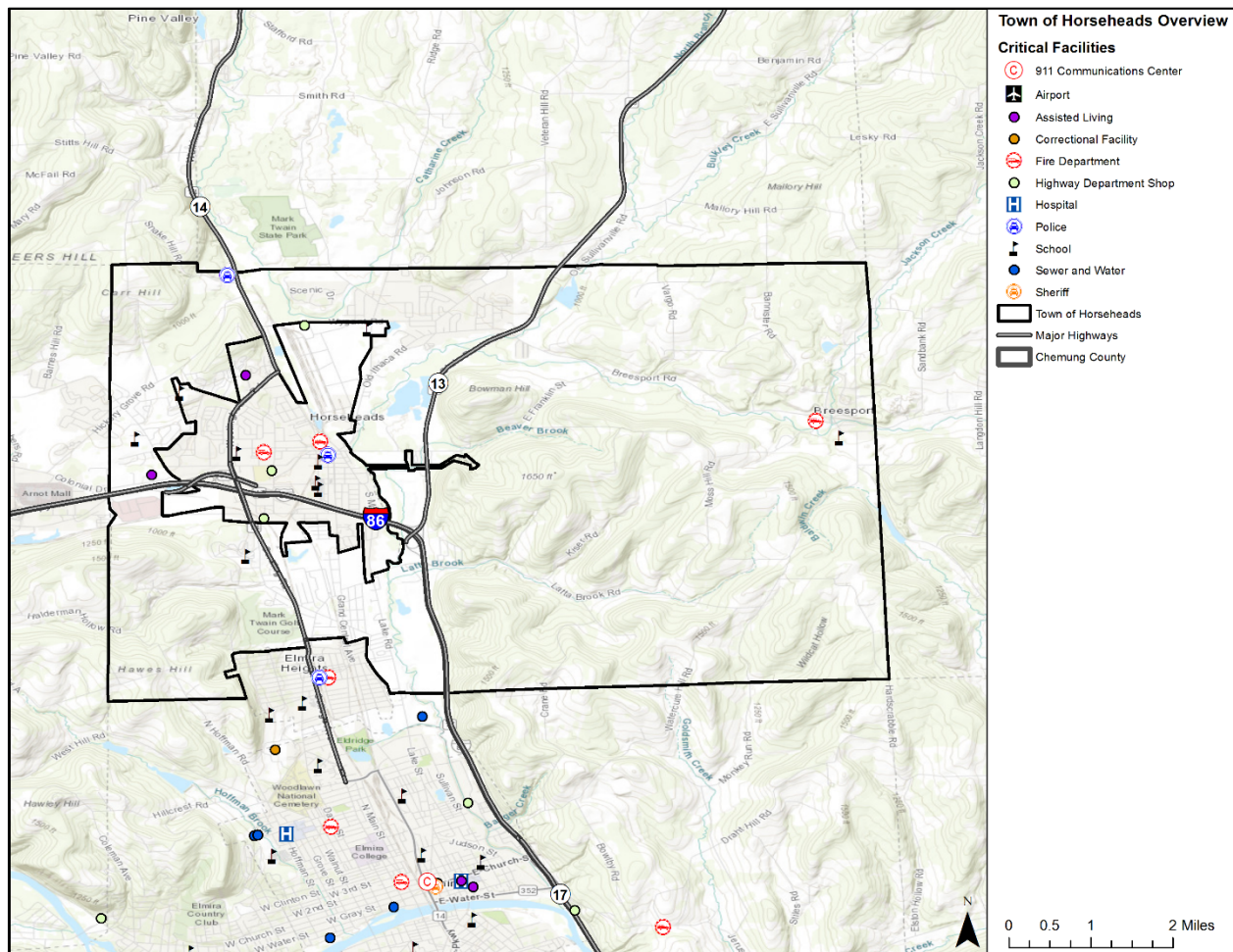
Email: supervisor@townofhorseheads.org

ANNEX J: TOWN OF HORSEHEADS

NOTE TO THE REVIEWER

It is noted that the Town of Horseheads and the Village of Horseheads are not listed separately in the NCEI. The NCEI is the most reliable source for historical storm event data. While the plan incorporates local and team input for historical events, for the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

Figure J-1. Town of Horseheads Planning Area



POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Town of Horseheads had a population of 19,485 residents. Table J-1 provides the population distribution within the Town of Horseheads.¹

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

ANNEX J: TOWN OF HORSEHEADS

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

Table J-1. Population Distribution for the Town of Horseheads

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Horseheads	19,485	21.9%	3,695	1,593

POPULATION GROWTH

The official 2010 Town of Horseheads population is 19,485. Overall, the Town of Horseheads experienced a decrease in population between 1980 and 2010 by 3.7%, or a decrease of 753 people. Table J-2 provides historic change rates in the Town of Horseheads.

Table J-2. Population for the Town of Horseheads, 1980-2010

JURISDICTION	1980 ²	1990 ³	2000 ⁴	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Town of Horseheads	20,238	19,926	19,561	19,485	-753	-3.7%	-76	-0.4%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Town of Horseheads might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table J-3, as provided Cornell University's Program on Applied Demographics⁵. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

³ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁴ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁵ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table J-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

HAZARD DESCRIPTION, LOCATION, EXTENT & HISTORICAL OCCURENCES

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Town of Horseheads, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Town of Horseheads experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Town of Horseheads is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Town of Horseheads are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Town of Horseheads:

Table J-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Horseheads	1 Fire Station, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Police Station, 4 Schools

Population over 65 in the Town of Horseheads is estimated at 20.2% of the total population or an estimated total of 3,965⁶ potentially vulnerable residents in the planning area based on age (Table J-5).

Table J-5 Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Town of Horseheads	3,965

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table J-6 depicts historical occurrences of thunderstorm wind events for the Town of Horseheads according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 23 thunderstorm wind events are known to have impacted the Town of Horseheads, based upon NCEI records.

Table J-6. Historical Thunderstorm Wind Events, 1955-2018⁷⁸

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Horseheads	7/6/1995	2:40 PM	Unknown	0	0	\$4,949	\$0
Town of Horseheads	5/31/1998	2:35 PM	Unknown	0	0	\$15,454	\$0
Town of Horseheads	5/31/1998	6:22 PM	Unknown	0	0	\$7,727	\$0
Town of Horseheads	6/30/1998	2:25 PM	Unknown	0	0	\$69,457	\$0
Town of Horseheads	9/27/1998	12:45 PM	Unknown	0	0	\$107,648	\$0
Town of Horseheads	6/7/1999	1:55 PM	60	0	0	\$0	\$0
Town of Horseheads	7/6/1999	6:00 PM	50	0	0	\$0	\$0

⁶ US Census Bureau 2016 data for the Town Horseheads.

⁷ Damages are reported from January 1955 through June 2018.

⁸ Magnitude is listed when available. Damage values are in 2018 dollars.

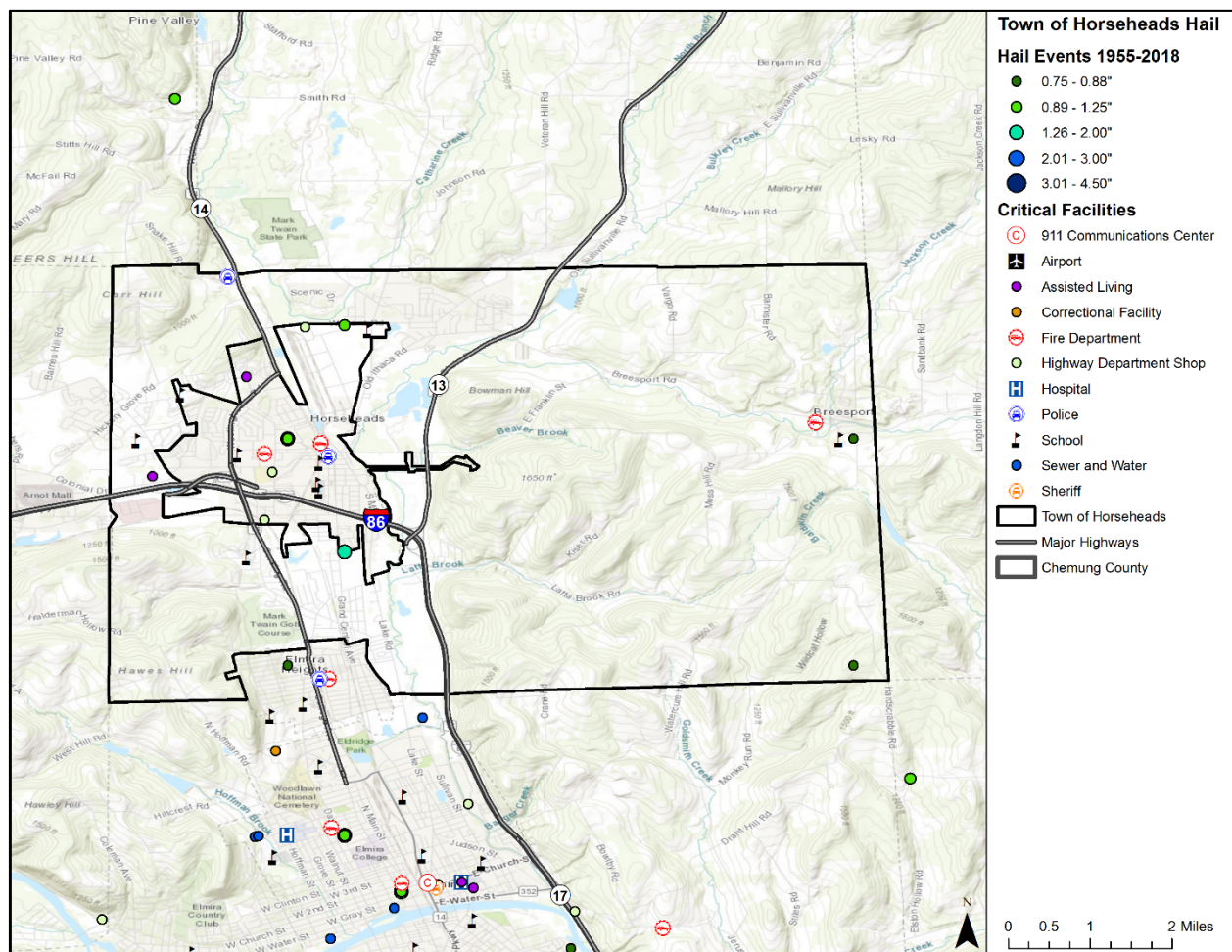
ANNEX J: TOWN OF HORSEHEADS

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Horseheads	9/12/2000	4:25 PM	60	0	0	\$0	\$0
Town of Horseheads	5/27/2001	8:10 PM	Unknown	0	0	\$0	\$0
Town of Horseheads	11/6/2005	4:10 PM	52	0	0	\$0	\$0
Town of Horseheads	7/28/2006	12:10 PM	50	0	0	\$0	\$0
Town of Horseheads	7/28/2006	12:20 PM	50	0	0	\$1,236	\$0
Town of Horseheads	8/17/2007	6:40 PM	50	0	0	\$2,420	\$0
Town of Horseheads	6/25/2009	3:45 PM	50	0	0	\$3,499	\$0
Town of Horseheads	6/25/2009	3:50 PM	50	0	0	\$0	\$0
Town of Horseheads	5/26/2011	4:01 PM	50	0	0	\$7,794	\$0
Town of Horseheads	7/7/2012	10:35 AM	50	0	0	\$10,981	\$0
Town of Horseheads	9/6/2012	3:25 PM	50	0	0	\$2,174	\$0
Town of Horseheads	6/24/2013	1:00 PM	50	0	0	\$5,387	\$0
Town of Horseheads	6/24/2013	3:03 PM	50	0	0	\$5,387	\$0
Town of Horseheads	7/23/2014	3:10 PM	50	0	0	\$10,560	\$0
Town of Horseheads	7/23/2014	3:15 PM	50	0	0	\$5,280	\$0
Town of Horseheads	7/25/2016	1:45 PM	50	0	0	\$5,280	\$0
Town of Horseheads Totals				0	0	\$265,182	

Based on the list of historical thunderstorm wind events for the Town of Horseheads, seven of the reported events have occurred since the 2012 Plan.

HAIL

Historical evidence shown in Figure J-2 demonstrates that the Town of Horseheads is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Table J-7 depicts historical occurrences of hail events for the Town of Horseheads according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 19 hail events are known to have impacted the Town of Horseheads, based upon NCEI records. Historical hail events are often provided on a county-wide basis in the NCEI database. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

Figure J-2. Historical Hail Events, 1955-2018**Table J-7. Historical Hail Events, 1955-2018⁹¹⁰**

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Horseheads	6/16/2008	2:45 PM	1.0	0	0	\$0	\$0
Town of Horseheads	6/16/2008	2:50 PM	0.88	0	0	\$0	\$0
Town of Horseheads	7/26/2008	5:20 PM	0.88	0	0	\$0	\$0
Town of Horseheads	6/26/2009	11:48 AM	1.5	0	0	\$0	\$0
Town of Horseheads	6/26/2009	11:50 AM	1.0	0	0	\$0	\$0

⁹ Damages are reported from January 1955 through June 2018.

¹⁰ Magnitude is listed when available. Damage values are in 2018 dollars.

ANNEX J: TOWN OF HORSEHEADS

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Horseheads	6/26/2009	11:55 AM	1.25	0	0	\$0	\$0
Town of Horseheads	6/26/2009	11:56 AM	1.0	0	0	\$0	\$0
Town of Horseheads	6/26/2009	11:59 AM	1.25	0	0	\$0	\$0
Town of Horseheads	5/3/2012	6:42 PM	0.75	0	0	\$0	\$0
Town of Horseheads	5/3/2012	9:34 PM	1.0	0	0	\$0	\$0
Town of Horseheads	9/6/2012	3:10 PM	1.0	0	0	\$0	\$0
Town of Horseheads	9/6/2012	3:25 PM	1.0	0	0	\$0	\$0
Town of Horseheads	9/6/2012	3:28 PM	1.5	0	0	\$16,308	\$0
Town of Horseheads	9/6/2012	3:30 PM	1.25	0	0	\$1,087	\$0
Town of Horseheads	9/6/2012	3:35 PM	1.75	0	0	\$21,744	\$0
Town of Horseheads	6/24/2013	1:15 PM	1.0	0	0	\$0	\$0
Town of Horseheads	6/30/2013	5:20 PM	1.0	0	0	\$0	\$0
Town of Horseheads	7/23/2014	3:15 PM	1.0	0	0	\$0	\$0
Town of Horseheads	7/23/2014	3:08 PM	1.0	0	0	\$0	\$0
Town of Horseheads Totals				0	0	\$39,140	

Based on the list of historical hail events for the Town of Horseheads, eleven reported events have occurred since the 2012 Plan.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the Town of Horseheads. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Horseheads can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Town of Horseheads is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 177 manufactured homes (approximately 2.0%) located in the Town of Horseheads. In addition, 79.9% (approximately 6,940 structures) of the residential structures in the Town of Horseheads were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table J-8. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Horseheads	177	6,940

The following critical facilities (Table J-9) would be vulnerable to thunderstorm events in the Town of Horseheads:

Table J-9. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Horseheads	1 Fire Station, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Police Station, 4 Schools

Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Horseheads has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Horseheads would be "Limited," with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$304,322 having an approximate annual loss estimate of \$4,792 (Table J-10).

Table J-10. Potential Annualized Losses for the Town of Horseheads

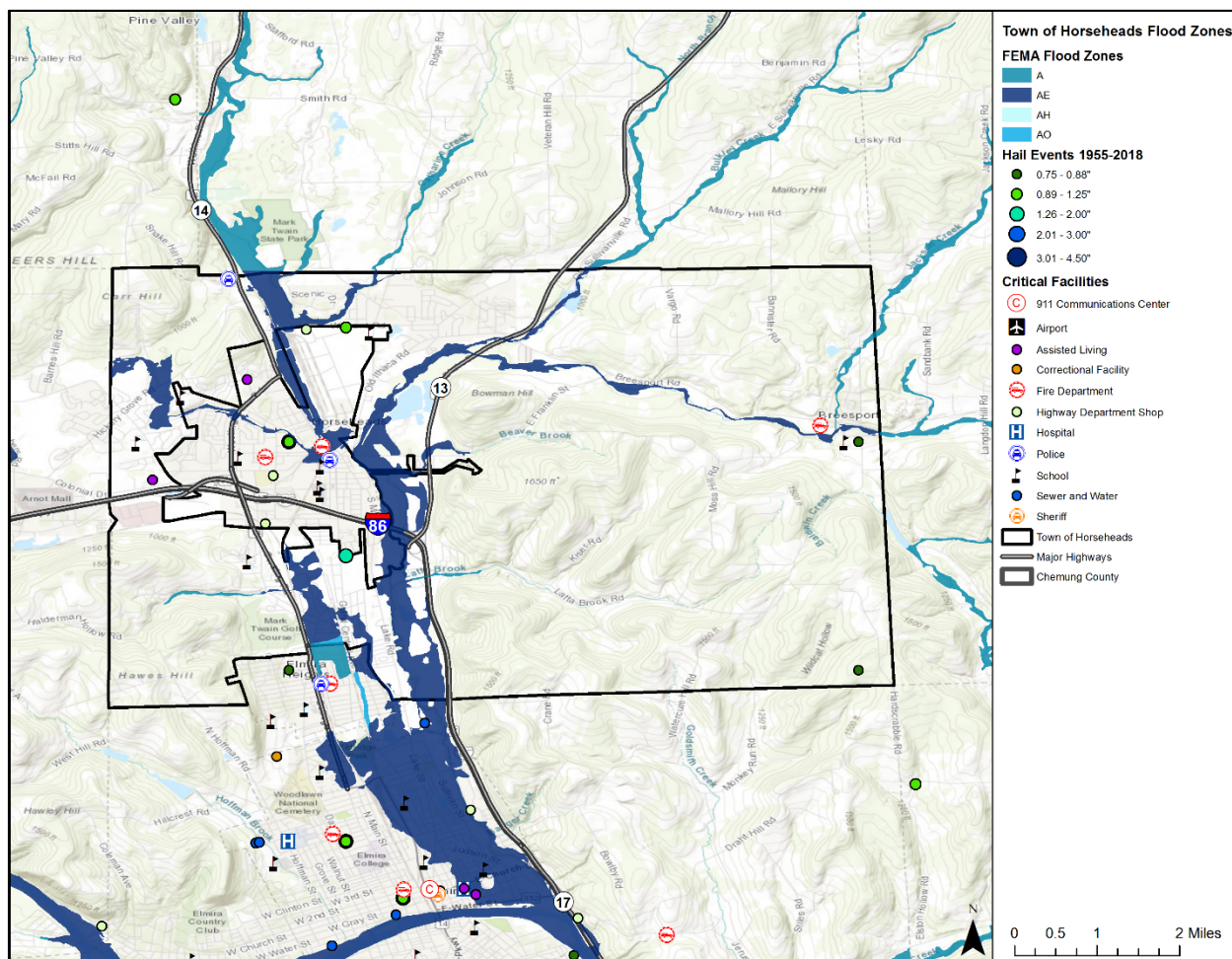
JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Horseheads	\$304,322	\$4,792

FLOOD

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. Full flood zone delineations with elevations are available in the Town of Horseheads. The location of estimated flood zones for the Town of Horseheads, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure J-3.

Figure J-3. Estimated Flood Zones in the Town of Horseheads



HISTORICAL OCCURRENCES

Table J-11 depicts historical occurrences of flood events for the Town of Horseheads according to the National Centers for Environmental Information (NCEI) data. From January 1996 to June 2018, 1 flood event is known to have impacted the Town of Horseheads, based upon NCEI records. Flood events are often reported on a county-wide basis, or under-reported for individual municipalities, particularly in smaller communities.

Table J-11. Historical Flood Events, 1996-2018¹¹

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Horseheads	5/28/2002	0	0	\$13,993	\$0
Town of Horseheads Totals		0	0	\$13,993	

Based on the list of historical flood events for the Town of Horseheads, no reported event has occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Horseheads can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Town of Horseheads is highly likely.

VULNERABILITY AND IMPACT

Table J-12 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table J-12. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Town of Horseheads	1 Fire Station

Historic loss estimates due to flood are presented in Table J-13 below.

Table J-13. Potential Annualized Losses, 1996-2018¹²

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Horseheads	1	0	0	\$13,993	\$622

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table J-14 depicts the level of impact for the Town of Horseheads.

¹¹ Values are in 2018 dollars. Events reported from January 1996 through June 2018.

¹² Events reported from January 1996 through June 2018.

Table J-14 Town of Horseheads Impact

JURISDICTION	IMPACT	DESCRIPTION
Town of Horseheads	Limited	The Town of Horseheads could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Town of Horseheads currently participates in the National Flood Insurance Program as well as the Community Rating System and has in place a flood damage prevention ordinance that includes standards above the minimum FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Town of Horseheads have developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Town of Horseheads as a moderate to high risk hazard during hazard ranking activities at the Risk Assessment Workshop. Many of the mitigation actions developed by the jurisdiction were developed with flood mitigation in mind. The Town of Horseheads has a designated floodplain administrator. The floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinances adopted by the Town of Horseheads outlines the minimum requirements for development in special flood hazard areas. Table J-15 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table J-15. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Town of Horseheads	N/A	07/12/2012	Good Standing	95

REPETITIVE LOSS

Table J-16 shows repetitive loss and severe repetitive loss properties for the Town of Horseheads.

Table C-16. Repetitive Loss and Severe Repetitive Loss Properties

JURISDICTION	BUILDING TYPE	NUMBER OF STRUCTURES	NUMBER OF LOSSES
Town of Horseheads	Single Family	1	2

TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of tornado events for the Town of Horseheads. Historical tornado events are often provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities are impacted. Tornado events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Town of Horseheads can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Town of Horseheads is likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 177 manufactured homes (approximately 2.0%) located in the Town of Horseheads. In addition, 79.9% (approximately 6,940 structures) of the residential structures in the Town of Horseheads were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table J-17. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Horseheads	177	6,940

The following critical facilities would be vulnerable to tornado events in the Town of Horseheads:

Table J-18. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Horseheads	1 Fire Station, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Police Station, 4 Schools

The average loss estimate of property and crop is \$0 (in 2018 dollars), having an approximate annual loss estimate of \$0 (Table J-19). Based on historic loss and damages, the impact of tornado on the Town of Horseheads can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table J-19. Potential Annualized Losses, 1983-2018¹³

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Horseheads	\$0	\$0

LANDSLIDE

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 9) provides a hazard description, location and extent of the landslide hazard for all participating jurisdictions. The Town of Horseheads has one known area susceptible or prone to landslide. According to the planning team, a small landslide area exists on the Mark Twain public golf course. The areas subject to landslide are located along the edge of the golf course and are considered to pose a minimal threat. This is the only known area subject to landslide within the Town of Horseheads.

Landslide susceptibility is defined as the degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. It can be assumed that unusually high precipitation or changes in existing conditions can initiate landslides in areas where rocks and soils have experienced numerous landslides in the past. Only potentially affected areas are identified by landslide susceptibility, not a time frame for when a landslide might occur. The same percentages that are used for landslide incidence are used for landslide susceptibility (high= 15+%, medium 1.5-15%, low 0-1.5%).

According to the New York State Hazard Mitigation Plan, the entire population in the Town of Horseheads is at a low risk of incidence and low risk for landslide susceptibility (0-1.5%).

HISTORICAL OCCURRENCES

The New York State Hazard Mitigation Plan indicates no previous landslide events or reported damages due to landslides in the Chemung County Planning Area. However, team input and previous mitigation planning cycles for the county indicate one documented landslide in the Town of Horseheads (Table J-20).

Table J-20. Historical Landslide Events, 1960-2018¹⁴

JURISDICTION	NUMBER OF EVENTS	YEAR	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Horseheads	1	Unknown/Ongoing	0	0	\$0	\$0
TOTAL LOSSES	1		0	0	\$0	

¹³ Events recorded from January 1983 through June 2018.

¹⁴ Damages are reported from January 1960 through June 2018.

PROBABILITY OF FUTURE EVENTS

Based on available records of historic events, 1 known historic events in a 59-year reporting period for the Town of Horseheads provides a probability of one event every ten years. This frequency supports an unlikely probability of future events for the Town of Horseheads.

VULNERABILITY AND IMPACT

According to the New York State Hazard Mitigation Plan, the entire population in the Chemung County Planning Area is at a low risk of incidence. The only known landslide within the Town of Horseheads is located in an undeveloped area on the fringe of a public golf course and poses no threat to structures, infrastructure or populations. No critical facilities in the Town of Horseheads is considered vulnerable to landslide.

The impact of landslides experienced in the Town of Horseheads has resulted in no known damages and no injuries or fatalities, supporting a limited severity of impact meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10 percent of property is destroyed or with major damage.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Bannister Rd culvert project 2. Vargo Rd creek stabilization 3. Bowman Hill Terrace stream stabilization 4. Crane Rd stabilization project 5. Rt. 13 upstream to East Franklin St 6. East Franklin St to Orminston Rd 7. Orminston Rd to T/Erin line.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	All projects are complete.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the Stormwater Coalition and STC for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.
Flood-14	Educate on Flood Mitigation Techniques	Flood	Promote the use of flood proofing techniques for retrofitting existing flood-prone development by distributing educational materials. Code Enf/Fldpln Admins have taken a continuing education course, and have educational packets created by Chemung County and STC with Mitigation Grant funds. Code Enf Officer attended week long course at EMI and was a creator/instructor of the local course.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Materials have been made available on the County website and brochures are provided for annual mailings to residence. Project is county wide.
Flood -15	Additional Floodplain Management Activities	Flood	Municipalities will work with STC, EMO and other agencies to improve CRS credits and increase CRS ratings to provide residents with better rates for NFIP. Code Enf Officer took E-278- NFIP/CRS course at NYS Fire Academy.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Maintained CRS rating 9. Code enforcement office has taken additional flood train management training. Action will be included in Plan Update.

ANNEX J: TOWN OF HORSEHEADS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
				Cost	Up to \$2,000 annually
Flood -19	Improve Drainage System	Flood	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.	Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in Plan Update.

NEW MITIGATION ACTIONS

Woodgate Road Culvert Replacement (near Prospect Road)		Town of Horseheads – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Woodgate Road culvert is a 6-foot diameter steel pipe that is aged and in need of replacement. This culvert allows access to Woodgate Road (a dead-end road) from Prospect Creek.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Woodgate Road culvert shall be replaced with a new concrete box culvert (of appropriate hydraulic capacity) to accommodate an appropriate design storm event return period. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) shall be reinstalled and guiderail shall be installed.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new box culvert will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$130,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culvert with bridge structure (concrete abutments & steel superstructure)	>\$200,000	More expensive than box culvert replacement
	Eliminate Woodgate Road stream crossing	>\$20,000	Not practicable. Woodgate Road is a dead-end road and the crossing is needed to provide required roadway access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX J: TOWN OF HORSEHEADS

Ashland Avenue Culvert Replacement		Town of Horseheads – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Ashland Avenue culvert is a 6.5-foot (approx.) diameter steel pipe that is inadequate and is in need of replacement.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Ashland Avenue culvert shall be replaced with a new concrete box culvert (of appropriate hydraulic capacity) to accommodate an appropriate design storm event return period. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) shall be installed and guiderail shall be installed.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new box culvert will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$250,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culvert with bridge structure (concrete abutments & steel superstructure)	>\$375,000	More expensive than box culvert replacement
	Eliminate Ashland Avenue stream crossing	>\$50,000	Not practicable. Ashland Avenue is a well-traveled roadway and the crossing is needed to provide required roadway access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Town of Horseheads – 3	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Floodplain Management		Town of Horseheads – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Improve CRS Ratings		Town of Horseheads – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions. Municipalities will work with STC, EMO and other agencies to improve CRS credits and increase CRS ratings to provide residents with better rates for NFIP.		
Action or Project Intended for Implementation			
Description of the Solution	STC, EMO and other agencies will facilitate activities resulting in a comprehensive approach to floodplain management. These activities will increase CRS ratings.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC, EMO and other agencies.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Town of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$10,000	Cost effective but provides no financial relief to residents
	Proposed project	Staff time	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Maintenance on the Old Chemung Canal Project		Town of Horseheads – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Chemung Canal joined the Chemung River, extending northward linking the river to the Erie Canal via Seneca Lake. The canal paralleled the Chemung River for long sections, sharing part of its water and drainage basin, by building dams and locks. The Canal has is no longer in use, but the remains are still in place. This area becomes paralyzed by the regional rains and flooding requiring maintenance.		
Action or Project Intended for Implementation			
Description of the Solution	Continue maintenance agreement with money being allocated by the municipalities for the old Chemung Canal project.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm	Estimated Benefits (losses avoided)	Continued maintenance of this program would result in
Useful Life	50 years		
Estimated Cost	\$2,000 per municipality		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Local funding sources
Responsible Organization	Town of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Increases in debris and sediment will increase flood depths and damages
	Complete removal of the canal remnants and alternative drainage mitigation	\$50,000,000	Not cost effective; Significant Environmental concerns
	Proposed Project	\$2,000 per municipality	Cost effective; reduces future flood damages
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		Town of Horseheads – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Horseheads Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	TOWN OF HORSEHEADS
Capital Improvements Plan	x
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	x
Economic Development Plan	
Emergency Operations Plan	
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	x
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	x
Real Estate Disclosure Requirements	
Site Plan Review Requirements	x
Stormwater Ordinance	x
Subdivision Regulations	x
Watershed Ordinance	

ANNEX J: TOWN OF HORSEHEADS

COMMUNITY CAPABILITY CHECKLIST	TOWN OF HORSEHEADS
Zoning Ordinance/Land Use Restrictions	x
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	x
Property Acquisition Program	
Public Education/Awareness Programs	x
Stream Maintenance Program	x
Storm Drainage Systems Maintenance Program	x
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	
Environmental Conservation Specialist	
Floodplain Administrator	x
GIS Specialist	x
Personnel with Hazard Knowledge	x
Planner	x
Public Information Official	x
Resource Development/Grant Writer	x

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JURISDICTION PROFILE

OVERVIEW

The Village of Horseheads is located in Chemung County, New York, with a population just under 6,500. The name is derived from the number of bleached skulls of pack horses left behind by the Sullivan Expedition. The village of Horseheads is located within the Town of Horseheads. It is north of the City of Elmira and is part of the Elmira Metropolitan Statistical Area. According to the United States Census Bureau, the village has a total area of 3.9 square miles, of which 0.02 square miles, or 0.38%, is water. Newtown Creek on the east side of the village flows south toward the Chemung River, a tributary of the Susquehanna. Figure K-1 shows the general location of the Village of Horseheads.

VILLAGE OF HORSEHEADS CONTACT INFORMATION

Name: Rob Maloney

Title: Mayor

Phone: (607)738-5704

Address: 202 S. Main Street, Horseheads, NY
14845

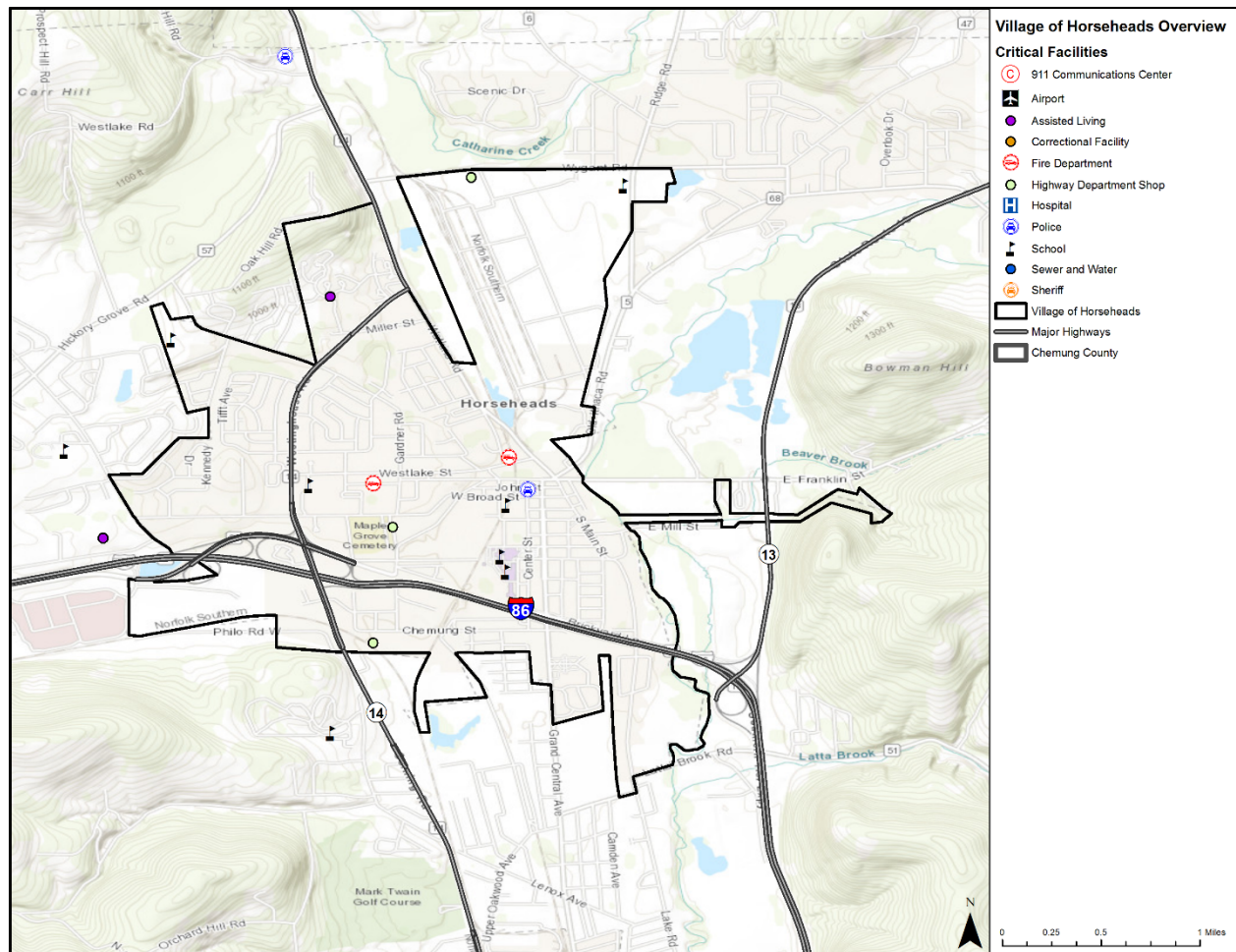
Email: rmaloney@horseheads.org

ANNEX K: VILLAGE OF HORSEHEADS

NOTE TO THE REVIEWER

It is noted that the Town of Horseheads and the Village of Horseheads are not listed separately in the NCEI. The NCEI is the most reliable source for historical storm event data. While the plan incorporates local and team input for historical events, for the purposes of this evaluation, both jurisdictions will be evaluated as equal entities with similar exposure and vulnerability due to their close proximity.

Figure K-1. Village of Horseheads Planning Area



POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Village of Horseheads had a population of 6,461 residents. Table K-1 provides the population distribution within the Village of Horseheads.¹

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

ANNEX K: VILLAGE OF HORSEHEADS

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

Table K-1. Population Distribution for the Village of Horseheads

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE ²	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Village of Horseheads	6,461	N/A	1,521	675

POPULATION GROWTH

The official 2010 Village of Horseheads population is 6,452. Overall, the Village of Horseheads experienced a decrease in population between 1980 and 2010 by 12.1%, or a decrease of 887 people. Table K-2 provides historic change rates in the Village of Horseheads.

Table K-2. Population Distribution for the Village of Horseheads

JURISDICTIONS	1980 ³	1990 ⁴	2000 ⁵	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Village of Horseheads	7,348	6,802	6,452	6,461	-887	-12.1%	9	0.1%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Village of Horseheads might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table K-3, as provided Cornell University's Program on Applied Demographics⁶. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² Percentages are based on city and town populations only.

³ https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

⁴ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁵ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁶ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table K-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

HAZARD DESCRIPTION, LOCATION, EXTENT & HISTORICAL OCCURENCES

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Village of Horseheads, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Village of Horseheads experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Village of Horseheads is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Village of Horseheads are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Village of Horseheads:

Table K-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Village of Horseheads	2 Fire Stations, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Police Station, 4 Schools

ANNEX K: VILLAGE OF HORSEHEADS

Population over 65 in the Village of Horseheads is estimated at 24.1% of the total population or an estimated total of 1,590⁷ potentially vulnerable residents in the planning area based on age (Table K-5).

Table K-5 Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Village of Horseheads	1,590

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table K-6 depicts historical occurrences of thunderstorm wind events for the Village of Horseheads according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 23 thunderstorm wind events are known to have impacted the Village of Horseheads, based upon NCEI records.

Table K-6. Historical Thunderstorm Wind Events, 1955-2018⁸⁹

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Horseheads	7/6/1995	2:40 PM	Unknown	0	0	\$4,949	\$0
Village of Horseheads	5/31/1998	2:35 PM	Unknown	0	0	\$15,454	\$0
Village of Horseheads	5/31/1998	6:22 PM	Unknown	0	0	\$7,727	\$0
Village of Horseheads	6/30/1998	2:25 PM	Unknown	0	0	\$69,457	\$0
Village of Horseheads	9/27/1998	12:45 PM	Unknown	0	0	\$107,648	\$0
Village of Horseheads	6/7/1999	1:55 PM	60	0	0	\$0	\$0

⁷ US Census Bureau 2016 data for the Village of Horseheads.

⁸ Damages are reported from January 1955 through June 2018.

⁹ Magnitude is listed when available. Damage values are in 2018 dollars.

ANNEX K: VILLAGE OF HORSEHEADS

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Horseheads	7/6/1999	6:00 PM	50	0	0	\$0	\$0
Village of Horseheads	9/12/2000	4:25 PM	60	0	0	\$0	\$0
Village of Horseheads	5/27/2001	8:10 PM	Unknown	0	0	\$0	\$0
Village of Horseheads	11/6/2005	4:10 PM	52	0	0	\$0	\$0
Village of Horseheads	7/28/2006	12:10 PM	50	0	0	\$0	\$0
Village of Horseheads	7/28/2006	12:20 PM	50	0	0	\$1,236	\$0
Village of Horseheads	8/17/2007	6:40 PM	50	0	0	\$2,420	\$0
Village of Horseheads	6/25/2009	3:45 PM	50	0	0	\$3,499	\$0
Village of Horseheads	6/25/2009	3:50 PM	50	0	0	\$0	\$0
Village of Horseheads	5/26/2011	4:01 PM	50	0	0	\$7,794	\$0
Village of Horseheads	7/7/2012	10:35 AM	50	0	0	\$10,981	\$0
Village of Horseheads	9/6/2012	3:25 PM	50	0	0	\$2,174	\$0
Village of Horseheads	6/24/2013	1:00 PM	50	0	0	\$5,387	\$0
Village of Horseheads	6/24/2013	3:03 PM	50	0	0	\$5,387	\$0
Village of Horseheads	7/23/2014	3:10 PM	50	0	0	\$10,560	\$0
Village of Horseheads	7/23/2014	3:15 PM	50	0	0	\$5,280	\$0
Village of Horseheads	7/25/2016	1:45 PM	50	0	0	\$5,280	\$0
Village of Horseheads Totals				0	0	\$265,182	

Based on the list of historical thunderstorm wind events for the Village of Horseheads, seven of the reported events have occurred since the 2012 Plan.

HAIL

Historical evidence shown in Figure K-2 demonstrates that the Village of Horseheads is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Table K-7 depicts historical occurrences of hail events for the Village of Horseheads according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 19 hail events are known to have impacted the Village of Horseheads, based upon NCEI records. Historical hail events are often provided on a county-wide basis in the NCEI database. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

ANNEX K: VILLAGE OF HORSEHEADS

Figure K-2. Historical Hail Events, 1955-2018

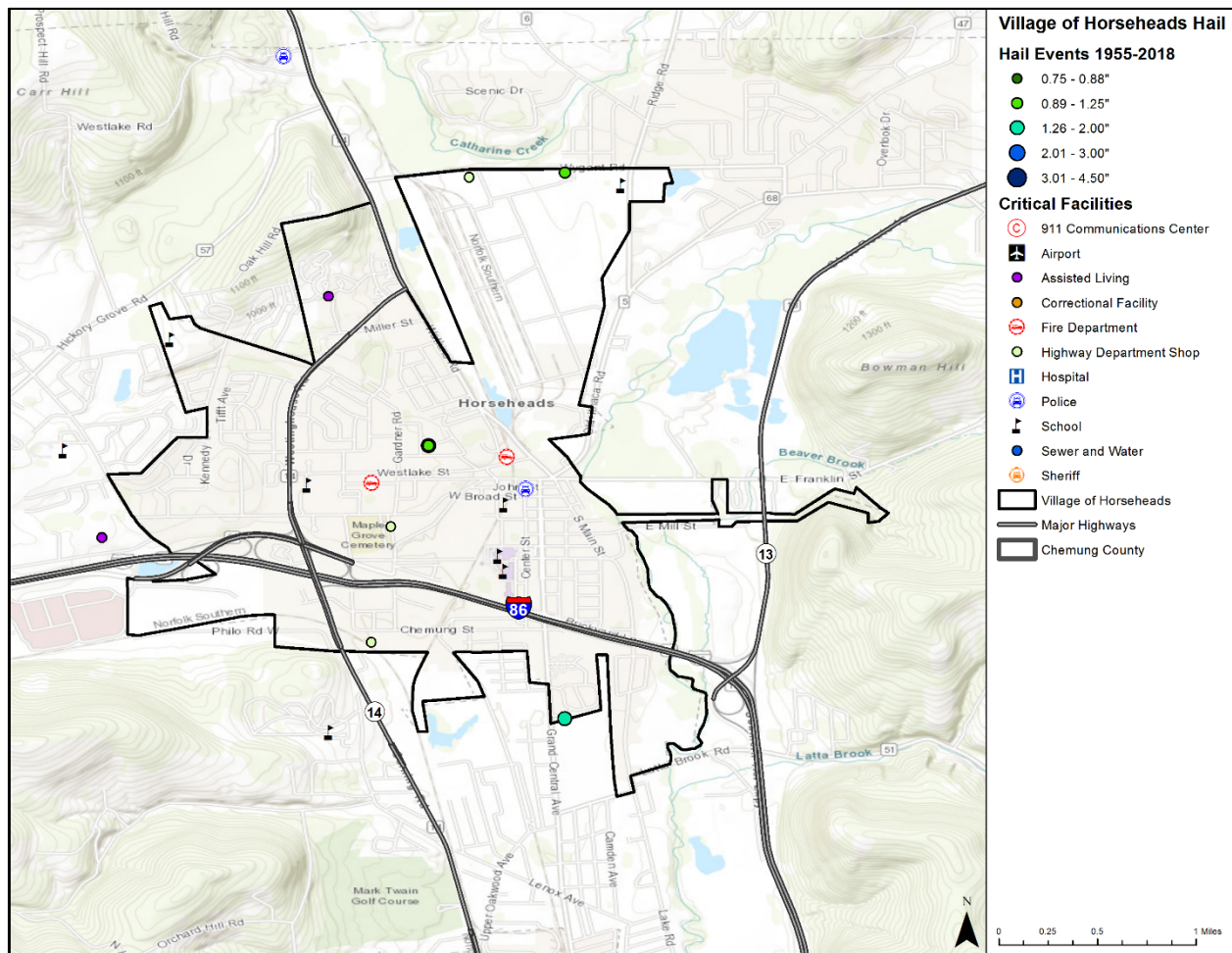


Table K-7. Historical Hail Events, 1955-2018¹⁰¹¹

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Horseheads	6/16/2008	2:45 PM	1.0	0	0	\$0	\$0
Village of Horseheads	6/16/2008	2:50 PM	0.88	0	0	\$0	\$0
Village of Horseheads	7/26/2008	5:20 PM	0.88	0	0	\$0	\$0
Village of Horseheads	6/26/2009	11:48 AM	1.5	0	0	\$0	\$0
Village of Horseheads	6/26/2009	11:50 AM	1.0	0	0	\$0	\$0

¹⁰ Damages are reported from January 1955 through June 2018.

¹¹ Magnitude is listed when available. Damage values are in 2018 dollars.

ANNEX K: VILLAGE OF HORSEHEADS

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Horseheads	6/26/2009	11:55 AM	1.25	0	0	\$0	\$0
Village of Horseheads	6/26/2009	11:56 AM	1.0	0	0	\$0	\$0
Village of Horseheads	6/26/2009	11:59 AM	1.25	0	0	\$0	\$0
Village of Horseheads	5/3/2012	6:42 PM	0.75	0	0	\$0	\$0
Village of Horseheads	5/3/2012	9:34 PM	1.0	0	0	\$0	\$0
Village of Horseheads	9/6/2012	3:10 PM	1.0	0	0	\$0	\$0
Village of Horseheads	9/6/2012	3:25 PM	1.0	0	0	\$0	\$0
Village of Horseheads	9/6/2012	3:28 PM	1.5	0	0	\$16,308	\$0
Village of Horseheads	9/6/2012	3:30 PM	1.25	0	0	\$1,087	\$0
Village of Horseheads	9/6/2012	3:35 PM	1.75	0	0	\$21,744	\$0
Village of Horseheads	6/24/2013	1:15 PM	1.0	0	0	\$0	\$0
Village of Horseheads	6/30/2013	5:20 PM	1.0	0	0	\$0	\$0
Village of Horseheads	7/23/2014	3:15 PM	1.0	0	0	\$0	\$0
Village of Horseheads	7/23/2014	3:08 PM	1.0	0	0	\$0	\$0
Village of Horseheads Totals				0	0	\$39,140	

Based on the list of historical hail events for the Village of Horseheads, eleven reported events have occurred since the 2012 Plan.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the Village of Horseheads. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Village of Horseheads can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Village of Horseheads is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 24 manufactured homes (approximately 0.7%) located in the Village of Horseheads. In addition, 78.3% (approximately 2,550 structures) of the residential structures in the Village of Horseheads were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table K-8. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Village of Horseheads	24	2,550

The following critical facilities (Table K-9) would be vulnerable to thunderstorm events in the Village of Horseheads:

Table K-9. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Village of Horseheads	2 Fire Stations, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Police Station, 4 Schools

Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Village of Horseheads has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Village of Horseheads would be "Limited," with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$304,322 having an approximate annual loss estimate of \$4,792 (Table K-10).

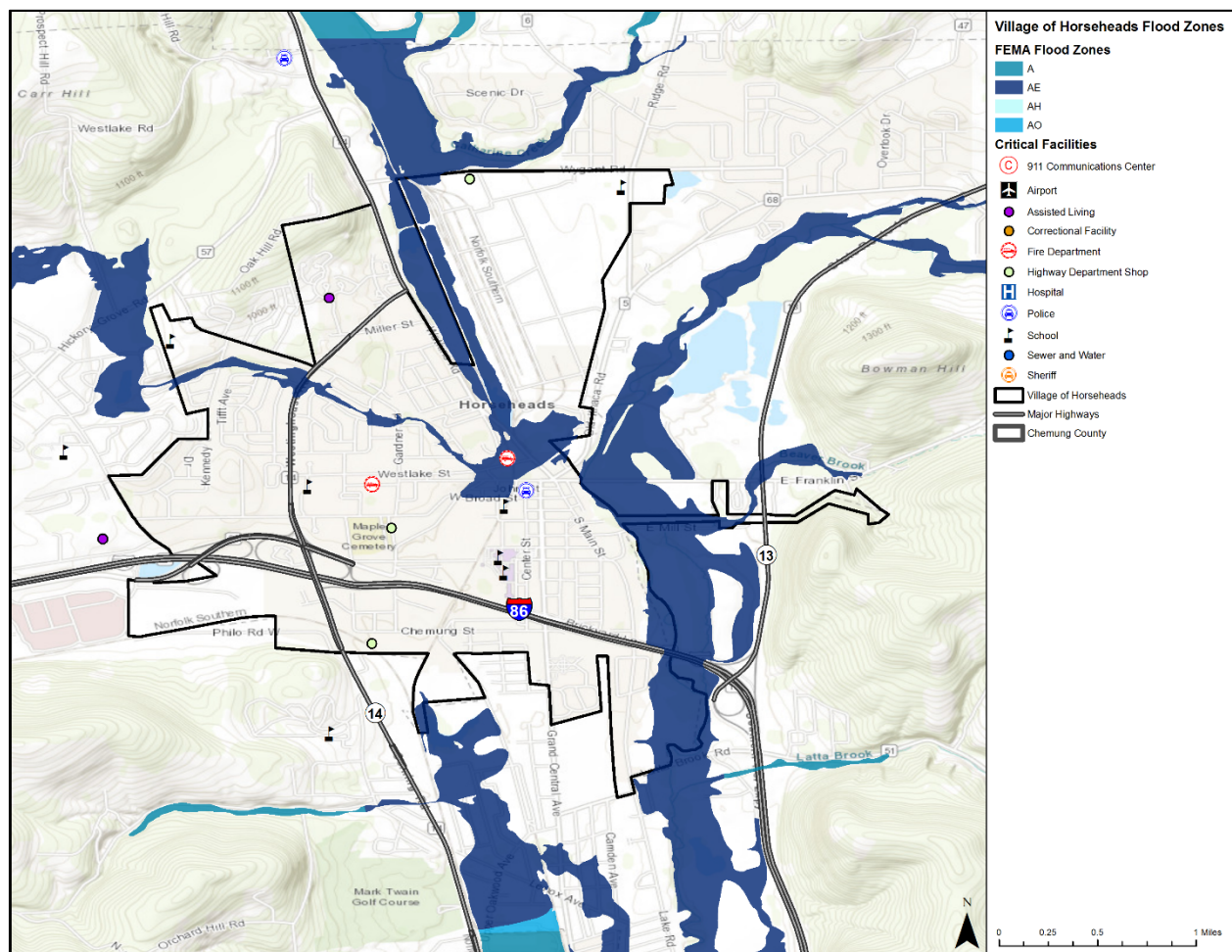
Table K-10. Potential Annualized Losses for the Village of Horseheads

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Horseheads	\$304,322	\$4,792

FLOOD

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. Full flood zone delineations with elevations are available in the Village of Horseheads. The location of estimated flood zones for the Village of Horseheads, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure K-3.

Figure K-3. Estimated Flood Zones in the Village of Horseheads

HISTORICAL OCCURRENCES

Table K-11 depicts historical occurrences of flood events for the Village of Horseheads according to the National Centers for Environmental Information (NCEI) data. From January 1996 to June 2018, 1 flood event is known to have impacted the Village of Horseheads, based upon NCEI records. Flood events are often reported on a county-wide basis, or under-reported for individual municipalities, particularly in smaller communities.

Table K-11. Historical Flood Events, 1996-2018¹²

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Horseheads	5/28/2002	0	0	\$13,993	\$0

¹² Values are in 2018 dollars. Events reported from January 1996 through June 2018.

ANNEX K: VILLAGE OF HORSEHEADS

Village of Horseheads Totals	0	0	\$13,993
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Based on the list of historical flood events for the Village of Horseheads, no reported event has occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Village of Horseheads can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Village of Horseheads is highly likely.

Based on recorded historical occurrences and extent within the Chemung County Planning Area, including all participating jurisdictions, flooding is highly likely and an event will likely occur within the next year.

VULNERABILITY AND IMPACT

Table K-12 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table K-12. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Village of Horseheads	None

Historic loss estimates due to flood are presented in Table K-13 below.

Table K-13. Potential Annualized Losses, 1996-2018¹³

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Horseheads	1	0	0	\$13,993	\$622

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table K-14 depicts the level of impact for the Village of Horseheads.

Table K-14 Village of Horseheads Impact

JURISDICTION	IMPACT	DESCRIPTION
Village of Horseheads	Limited	The Village of Horseheads could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

¹³ Events reported from January 1996 through June 2018.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Village of Horseheads currently participates in the National Flood Insurance Program as well as the Community Rating System and has in place a flood damage prevention ordinance that includes standards above the minimum FEMA requirement.

The Village of Horseheads currently participates in the National Flood Insurance Program as well as the Community Rating System and has in place a flood damage prevention ordinance that includes standards above the minimum FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Village of Horseheads have developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Village of Horseheads as a moderate to high risk hazard during hazard ranking activities at the Risk Assessment Workshop. Flooding was identified by the Village of Horseheads as a moderate risk hazard during hazard ranking activities at the Risk Assessment Workshop. Many of the mitigation actions for both jurisdictions were developed with flood mitigation in mind. Both the Village of Horseheads and the Village of Horseheads have a designated floodplain administrator. Each floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinances adopted by both the Village of Horseheads and the Village of Horseheads outlines the minimum requirements for development in special flood hazard areas. Table K-15 provides the most recent CAC/CAV dates along with the current status for each jurisdiction.

Table K-15. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Village of Horseheads	N/A	06/14/2016	Good Standing	0

REPETITIVE LOSS

The Village of Horseheads currently has no repetitive loss or severe repetitive loss properties.

TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of tornado events for the Town or Village of Horseheads. Historical tornado events are often provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities are impacted. Tornado events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Village of Horseheads can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Village of Horseheads is likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 177 manufactured homes (approximately 2.0%) located in the Village of Horseheads. In addition, 79.9% (approximately 6,940 structures) of the residential structures in the Village of Horseheads were built before 1980. The US Census data indicates a total of 24 manufactured homes (approximately 0.7%) located in the Village of Horseheads. In addition, 78.3% (approximately 2,550 structures) of the residential structures in the Village of Horseheads were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table K-16. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Village of Horseheads	24	2,550

The following critical facilities would be vulnerable to tornado events in the Village of Horseheads:

Table K-17. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Village of Horseheads	2 Fire Stations, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Police Station, 4 Schools

The average loss estimate of property and crop is \$0 (in 2018 dollars), having an approximate annual loss estimate of \$0 (Table K-18). Based on historic loss and damages, the impact of tornado on the Village of Horseheads can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table K-18. Potential Annualized Losses, 1983-2018¹⁴

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Horseheads	\$0	\$0

¹⁴ Events recorded from January 1983 through June 2018.

LANDSLIDE

The Village of Horseheads has no known areas susceptible or prone to landslide (Section 9). The Village of Horseheads has no known historical occurrences of landslide and does not anticipate any landslide events in the future. The Village of Horseheads has no known historical occurrences of landslide and does not anticipate any landslide events in the future. Each municipality has determined that this hazard is not a threat to their respective community and therefore does not require further analysis.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood-17	Floodplain Management	Flood	Provide technical assistance through the stormwater Coalition and STC for more effective municipal legislation regarding land use, zoning laws, Stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project is complete.
Flood-18	Protect Critical Facilities	Flood	Reline stormwater sewer in Village of Horseheads, running from HHDS FD to New Town Creek.	Cost	> \$1 Million
				Level of Protection	10 Year storm event
				Damages Avoided; Evidence of Success	Initial planning was completed. Grant proposal declined. Project not funded and incomplete. Action will be included in Plan Update.

NEW MITIGATION ACTIONS

Upgrade / Replacement of Swamp Storm Sewer		Village of Horseheads – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The current stormwater conveyance conduit is inadequate for current needs and is in need of upgrading and/or replacement. This storm sewer is approximately 2065 LF and passes below two large commercial buildings, as well as public streets. This storm sewer drains a swamp (where Prospect Creek discharges) and conveys flows to Newtown Creek.		
Action or Project Intended for Implementation			
Description of the Solution	The Village would like to hire a specialty contractor to reline the structure with an in-situ lining system to provide structural integrity to the entire length of the existing stormwater conveyance conduit.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year flood event	Estimated Benefits (losses avoided)	Will help mitigate flooding in the Village of Horseheads and Town of Horseheads and will prevent illegal transfer of flow from the Susquehanna River Basin to the Finger Lakes Basin.
Useful Life	50 years		
Estimated Cost	\$1.2 million		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 5 year
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Hazard Mitigation Grant; in-kind for local share
Responsible Organization	Village of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Village Improvement Plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Buy out all businesses and property above the drainage structure and raze to expose the conduit then replace.	\$3 million	Cost prohibitive and would decrease Village economy by reducing commercial base.
	Design and installation of a stormwater pump station and force main system to convey stormwater to Newtown Creek	\$2 million	Cost prohibitive and would require purchase of properties (or easements) for proposed infrastructure.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX K: VILLAGE OF HORSEHEADS

Emergency Generator for Village's Highway Building		Village of Horseheads – 2	
Risk/Vulnerability			
Hazard of Concern	Flood, Winter Storm, Thunderstorm, Tornado		
Description of the Problem	During power outages, the Highway building is without lights, communications and maintenance equipment/machinery. The operations are basically brought to a halt.		
Action or Project Intended for Implementation			
Description of the Solution	Installation of an emergency generator, with hard wired quick connections, that is capable of accommodating the entire building.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	Highway operations would be able to continue uninterrupted during power outages (often the times of greatest need).
Useful Life	30 years		
Estimated Cost	\$225,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding with in-kind match, possible partial funding through Village budget
Responsible Organization	Village of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Local work plan and budget workshops
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make building generator ready	\$100,000.00	Would still be without power during the period of time we request a generator from State through Emergency Management
	On a temporary basis, work from a different location	>\$2500.00 per incident	Would require another shop to make room and accommodate employee/equipment needs or rent maintenance space. Such a shop may not be available. Extra travel time taking away from response work.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX K: VILLAGE OF HORSEHEADS

Generator Project for Groundwater Supply Wells #1 & #2		Village of Horseheads – 3	
Risk/Vulnerability			
Hazard of Concern	Flood, Thunderstorm, Winter Storm, Tornado		
Description of the Problem	During periods of power outages, groundwater supply Wells #1 & #2 are not functional, due to the lack of emergency power. Well #1 and Well #2 are the primary water supply sources for the Village's municipal water system. Lack of emergency power could result in the inability to supply water to the users, as well as compromising fire protection capabilities.		
Action or Project Intended for Implementation			
Description of the Solution	Complete improvements to make Wells 1&2 generator ready and purchase a 200KW generator to be kept on a trailer, making it immediately available when needed for either the Well #1 or the Well #2.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	Will provide the Village the ability to maintain operation of Wells #1 and #2 during power outages, to ensure that water supply to the community (as well as fire protection capabilities) is reliably maintained.
Useful Life	30 years		
Estimated Cost	\$275,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding with in-kind local share, and possible local budget funding
Responsible Organization	Village of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Village work plan and budget workshops
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make wells generator ready without purchase of generator	\$70,000.00	Would still need to request to borrow a generator through Emergency Management, which many times may be unavailable for periods of time that are longer than the outage.
	Construction a water pump station (with generator) at connection to Elmira Water Board system.	>\$1.2 million	This pump station would convey water from the Elmira Water Board system to the Village system, providing a back-up water supply.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX K: VILLAGE OF HORSEHEADS

Public Education and Outreach		Village of Horseheads – 4	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Village of Horseheads Administration	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX K: VILLAGE OF HORSEHEADS

Flood Study and Mapping		Village of Horseheads – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Village of Horseheads Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Village of Horseheads	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	VILLAGE OF HORSEHEADS
Capital Improvements Plan	
Master or Comprehensive Plan	x
Community Wildfire Protection Plan	
Continuity of Operations	
Economic Development Plan	
Emergency Operations Plan	x
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	x
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	x
Real Estate Disclosure Requirements	
Site Plan Review Requirements	x
Stormwater Ordinance	x
Subdivision Regulations	x
Watershed Ordinance	

ANNEX K: VILLAGE OF HORSEHEADS

COMMUNITY CAPABILITY CHECKLIST	VILLAGE OF HORSEHEADS
Zoning Ordinance/Land Use Restrictions	x
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	x
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	x
Property Acquisition Program	
Public Education/Awareness Programs	x
Stream Maintenance Program	x
Storm Drainage Systems Maintenance Program	x
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	
Environmental Conservation Specialist	
Floodplain Administrator	x
GIS Specialist	x
Personnel with Hazard Knowledge	x
Planner	x
Public Information Official	x
Resource Development/Grant Writer	

ANNEX L: VILLAGE OF MILLPORT

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JURISDICTION PROFILE

OVERVIEW

The Village of Millport is located in Chemung County, New York, with a population just over 300. The name comes from its former status as a canal port. Millport is in the northwest quadrant of the Town of Veteran and is north of Elmira. It is part of the Elmira Metropolitan Statistical Area. According to the United States Census Bureau, the village has a total area of 0.35 square miles, all of which is land. Figure L-1 shows the general location of the Village of Millport.

VILLAGE OF MILLPORT CONTACT INFORMATION

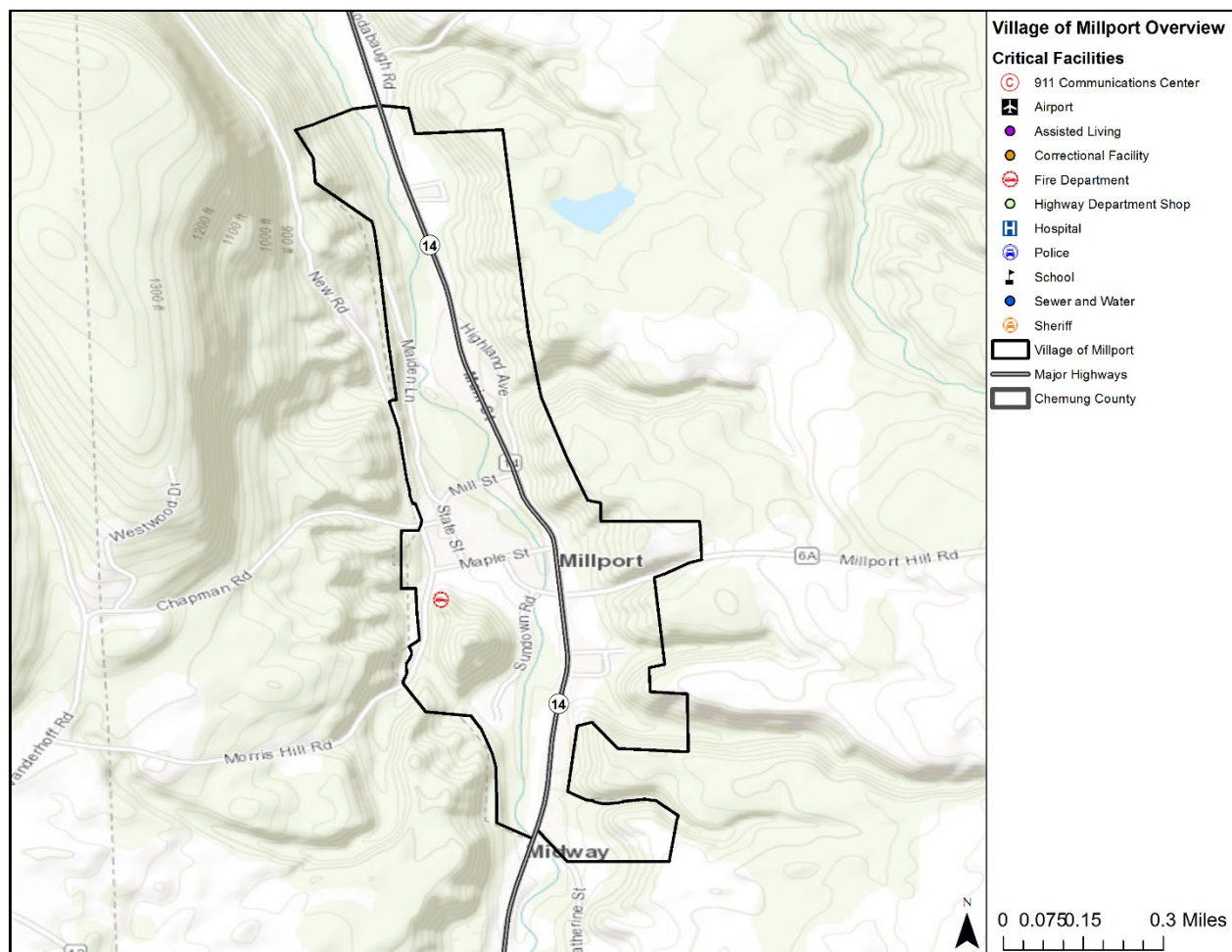
Name: Robert BeCraft

Title: Mayor/Supervisor

Phone: (607)739-0703

Address: 4246 Main Street, Millport, NY 14864

Email: vlgclerk@stny.rr.com

Figure L-1. Village of Millport Planning Area

POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Village of Millport had a population of 312 residents. Table L-1 provides the population distribution within the Village of Millport.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table L-1. Population Distribution for the Village of Millport

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE ²	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Village of Millport	312	N/A	40	77

POPULATION GROWTH

The official 2010 Village of Millport population is 312. While the change in population was not available for the Village of Millport, it is assumed to be similar to the Town of Veteran which experienced a decrease in population between 1980 and 2010 by 9.3%. Table L-2 provides historic change rates in the Village of Millport.

Table L-2. Population for the Village of Millport, 1980-2010

JURISDICTION	1980 ³	1990 ⁴	2000 ⁵	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Village of Millport	N/A	N/A	297	312	N/A	N/A	N/A	N/A

FUTURE DEVELOPMENT

To better understand how future growth and development in the Village of Millport might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table L-3, as provided Cornell University's Program on Applied Demographics⁶. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² Percentages are based on city and town populations only.

³ https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

⁴ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁵ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁶ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table L-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

HAZARD DESCRIPTION, LOCATION, EXTENT & HISTORICAL OCCURENCES

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Village of Millport, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Village of Millport experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Village of Millport is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Village of Millport are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Village of Millport:

Table L-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Village of Millport	1 Fire Station

Population over 65 in the Village of Millport is estimated at 10.2% of the total population or an estimated total of 50⁷ potentially vulnerable residents in the planning area based on age (Table L-5).

⁷ US Census Bureau 2016 data for the Village of Millport.

Table L-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Village of Millport	50

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table L-6 depicts historical occurrences of thunderstorm wind events for the Village of Millport according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 3 thunderstorm wind events are known to have impacted the Village of Millport, based upon NCEI records.

Table L-6. Historical Thunderstorm Wind Events, 1955-2018⁸⁹

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Millport	11/16/2006	2:30 PM	50	0	0	\$1,249	\$0
Village of Millport	8/19/2011	2:15 PM	50	0	0	\$3,332	\$0
Village of Millport	7/7/2012	10:21 AM	50	0	0	\$5,491	\$0
Village of Millport Totals				0	0	\$10,071	

Based on the list of historical thunderstorm wind events for the Village of Millport, one of the reported events have occurred since the 2012 Plan.

HAIL

Historical evidence shown in Figure L-2 demonstrates that the Village of Millport is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Table L-7 depicts historical occurrences of hail events for the Village of Millport according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 1 hail event is known to have impacted the Village of Millport, based upon NCEI records. Historical hail events are often provided on a county-wide basis in the NCEI database.

⁸ Damages are reported from January 1955 through June 2018.

⁹ Magnitude is listed when available. Damage values are in 2018 dollars.

ANNEX L: VILLAGE OF MILLPORT

Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

Figure L-2. Historical Hail Events, 1955-2018

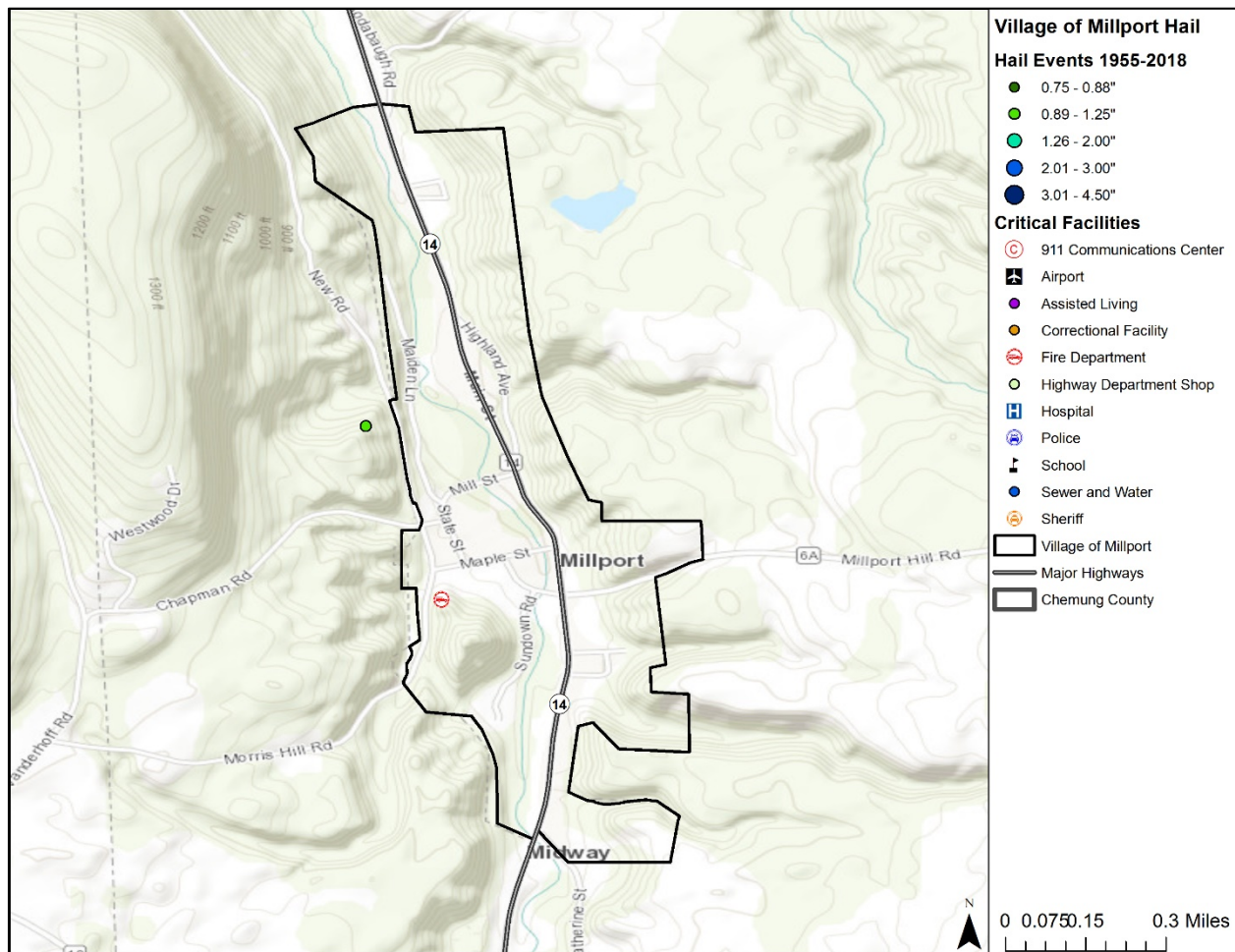


Table L-7. Historical Hail Events, 1955-2018¹⁰¹¹

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Millport	9/27/2007	5:55 PM	1.25	0	0	\$0	\$0
Village of Millport Totals				0	0	\$0	

¹⁰ Damages are reported from January 1955 through June 2018.

¹¹ Magnitude is listed when available. Damage values are in 2018 dollars.

Based on the list of historical hail events for the Village of Millport, no reported events have occurred since the 2012 Plan.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the Village of Millport. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Village of Millport can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Village of Millport is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 41 manufactured homes (approximately 21.8%) located in the Village of Millport (Table L-8). In addition, 93.7% (approximately 176 structures) of the residential structures in the Village of Millport were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table L-8. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Village of Millport	41	176

The following critical facilities (Table L-9) would be vulnerable to thunderstorm events in the Village of Millport:

Table L-9. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Village of Millport	1 Fire Station

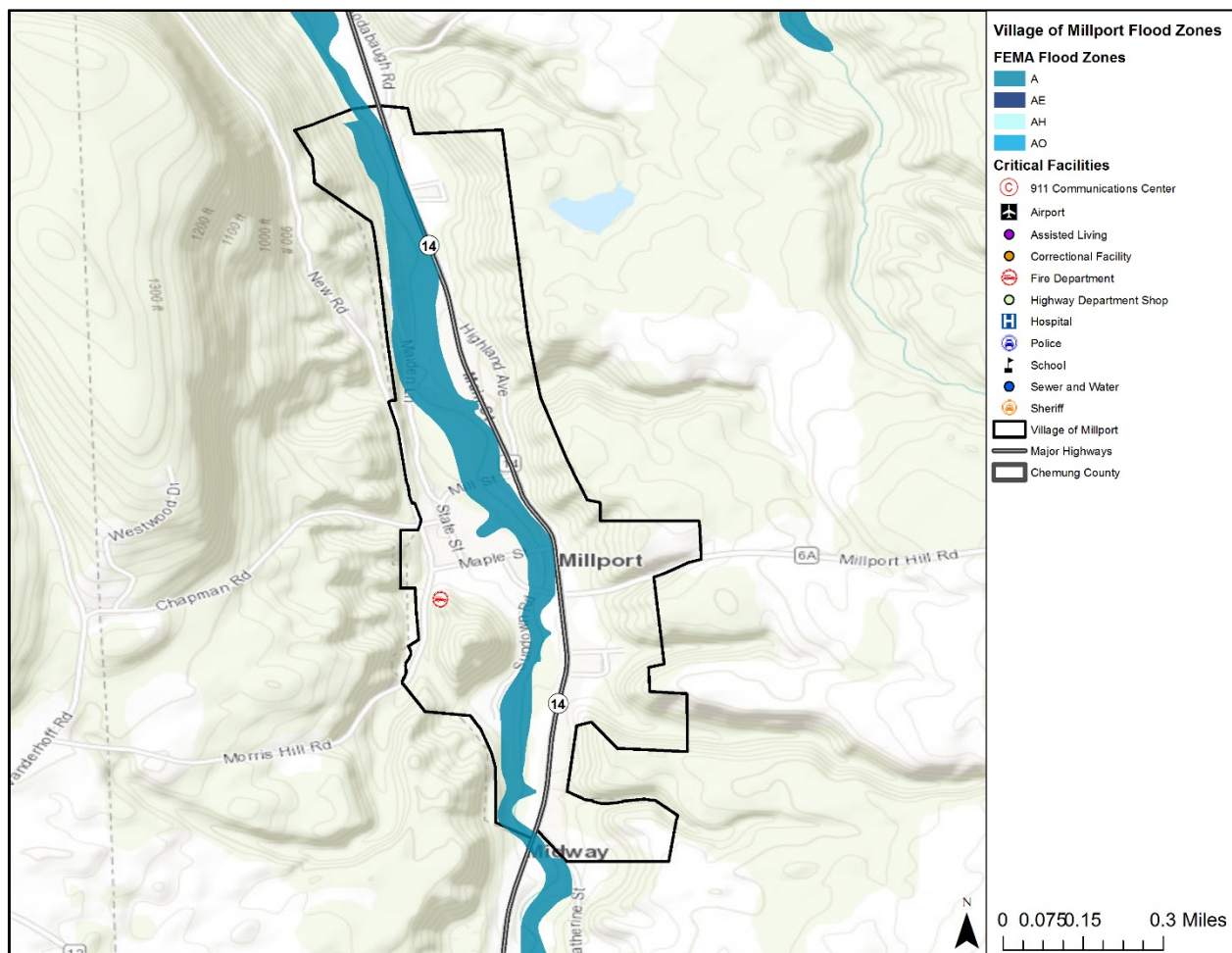
Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Village of Millport has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Village of Millport would be "Limited," with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$10,071 having an approximate annual loss estimate of \$157 (Table L-10).

Table L-10. Potential Annualized Losses for the Village of Millport

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Millport	\$10,071	\$157

FLOOD**HAZARD DESCRIPTION, LOCATION AND EXTENT**

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. A limited flood hazard boundary map with no elevations is available for the Village of Millport. The location of estimated flood zones for the Village of Millport, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure L-3.

Figure L-3. Estimated Flood Zones in the Village of Millport

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of flood events for the Village of Millport. Historical flood events may be reported on a county-wide basis, specifically when it comes to smaller communities with limited capacity. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for participating jurisdictions. According to historical records for the Chemung County Planning Area, the Village of Millport can expect to experience a flood event every year.

PROBABILITY OF FUTURE EVENTS

Incidents reported at the county level provide a more robust risk assessment for every participating jurisdiction, particularly smaller jurisdictions. According to historical records for the Chemung County Planning Area, the Village of Millport can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Village of Millport is highly likely.

VULNERABILITY AND IMPACT

Table L-11 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table L-11. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Village of Millport	None

Historic loss estimates due to flood are presented in Table L-12 below.

Table L-12. Potential Annualized Losses, 1996-2018¹²

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Millport	0	0	0	\$0	\$0

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table L-13 depicts the level of impact for the Village of Millport.

¹² Events reported from January 1996 through June 2018.

Table L-13 Village of Millport Impact

JURISDICTION	IMPACT	DESCRIPTION
Village of Millport	Limited	The Village of Millport could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Village of Millport currently participates in the National Flood Insurance Program and is in good standing. The community has in place a flood damage prevention ordinance that includes standards that meet the minimum standard FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Village of Millport has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Village of Millport as a high-risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. The Village of Millport has a designated floodplain administrator. The Village of Millport floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the Village of Millport outlines the minimum requirements for development in special flood hazard areas. Table L-14 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table L-14. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Village of Millport	N/A	01/22/2007	Good Standing	3

REPETITIVE LOSS

The Village of Millport currently has no repetitive loss or severe repetitive loss properties.

TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of tornado events for the Village of Millport. Historical tornado events are often

provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities, such as the Village of Millport, are impacted. Tornado events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Village of Millport can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Village of Millport is likely.

VULNERABILITY AND IMPACT

The U.S. Census data indicates a total of 41 manufactured homes (Table L-15) located in the Village of Millport (21.8% of housing units). In addition, 93.7% (approximately 176 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table L-15. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Village of Millport	41	176

The following critical facilities would be vulnerable to tornado events in the Village of Millport:

Table L-16. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Village of Millport	1 Fire Station

The average loss estimate of property and crop is \$0 (in 2018 dollars), having an approximate annual loss estimate of \$0 (Table L-17). Based on historic loss and damages, the impact of tornado on the Village of Millport can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table L-17. Potential Annualized Losses, 1983-2018¹³

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Millport	\$0	\$0

¹³ Events recorded from January 1983 through June 2018.

LANDSLIDE

The Village of Millport has no known areas susceptible or prone to landslide (Section 9). The Village of Millport has no known historical occurrences of landslide and does not anticipate any landslide events in the future. The municipality determined that this hazard is not a threat to the village and therefore does not require further analysis.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Pantherlick is partially completed. Catherine Creek and Sleeper Run projects were completed. 3 floodplain houses were bought out on Catherine Creek. Action will be included in Plan Update.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the Stormwater Coalition for more effective municipal legislation regarding land use, zoning laws, Stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Updated the Comprehensive Plan. Updates to land use regulations are in progress and include many changes to improve stormwater management and flood risk reduction. Action will be included in Plan Update.
Flood-11b	Protect Infrastructure	Flood	Upgrade Dann Blvd to at least oil and stone and install proper drainage structures to prevent future flood damage and ensure Fire/Police/EMS direct route to residents during emergency response will not be blocked, causing lengthy detour.	Cost	Grant
				Level of Protection	10 Years
				Damages Avoided; Evidence of Success	Project complete.

NEW MITIGATION ACTIONS

Generator for Millport Fire Station		Village of Millport – 1	
Risk/Vulnerability			
Hazard of Concern	Thunderstorm, Winter Storm, Tornado, Flood		
Description of the Problem	During power outages the Fire Station has no lights, heat, communications or equipment maintenance machinery. The Fire Station also serves as the Village Emergency Operations Center and the primary stop over point for residents affected by an emergency.		
Action or Project Intended for Implementation			
Description of the Solution	Install an Emergency Generator with hardwired quick connections		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	The Fire Department and Village EOC would be able to continue operations during a power outage and provide a safe place for residents during an emergency.
Useful Life	30 years		
Estimated Cost	\$200,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding
Responsible Organization	Village of Millport	Local Planning Mechanisms to be Used in Implementation, if any	Local Village work plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make building generator ready	\$100,000.00	Would still be without power until we request a generator from State through Emergency Management
	Use alternate facilities such as Village of Millport Town Hall and Town Highway for Fire Ops	\$2500 per occurrence	Would displace staff and make us rely on others for services, and possibly rent space for maintenance of Fire Equipment.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX L: VILLAGE OF MILLPORT

Development of Back-Up Groundwater Supply Well for Municipal Water System		Village of Millport – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Insufficient Redundancy regarding the Water Supply System for the Village's municipal water system. The Village only has one well to serve the residents. It is a shallow well at 40 feet deep and is in close proximity to an agricultural field. If this existing well is ever out-of-service (such as being contaminated by flood waters), the Village will be without water, compromising the fire protection system.		
Action or Project Intended for Implementation			
Description of the Solution	Secure a location for the back-up water supply well; complete associated test well, flow testing, and water quality testing; design back-up well; pursue and obtain regulatory permitting; and install back-up water supply well facility.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	The Village would have a back-up well to improve water supply redundancy to better ensure a constant supply of potable water for the residents, as well as a more reliable fire protection system.
Useful Life	100 years		
Estimated Cost	\$500,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	6 months	Potential Funding Sources	Grant funding, possible State and Local funding
Responsible Organization	Village of Millport	Local Planning Mechanisms to be Used in Implementation, if any	Local Village work plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Connection to & Extension of Horseheads Village System	> \$2,000,000	Cost prohibitive. Also, a regulatory issue may exist as water from the Susquehanna River watershed would be transferred to the Lake Ontario watershed.
	Connection to & Extension of Village of Montour Falls System	>\$2,000,000	Cost prohibitive and not viable as a long-term solution for well contamination
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Lewis Street Culvert Replacement		Village of Millport – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Lewis Street culvert installation lacks headwalls and guiderail. The current lack of headwalls deters from the hydraulic capacity of the installation and also does not adequately protect the roadway fill from erosion during highwater events. The lack of guiderail presents a safety issue for motorists.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Lewis Street culvert shall be replaced with a new steel culvert. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) and guide railing shall be installed. The existing roadway within the limits of construction shall be repaved.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25-year storm event (approx.)	Estimated Benefits (losses avoided)	A new culvert with headwalls and guiderail will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$30,500		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Village of Millport	Local Planning Mechanisms to be Used in Implementation, if any	Village Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culvert with box culvert	>\$50,000	More expensive than steel culvert option
	Eliminate Lewis Street Culvert	<\$20,000	Not practicable. Culvert crossing is necessary to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Village of Millport – 4	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Village of Millport Administration	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Panther Lick Stream Stabilization Project		Village of Millport – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excess sediment directed to Catharine Creek tributary, resulting in downstream channel capacity issues and sediment introduced to Catharine Creek, a high-quality trout fishery. The existing Panther Lick near Dunn Road is unstable, resulting in excessive streambank erosion and erosion. This erosion and sedimentation results in sedimentation of downstream stream reaches, reducing channel capacity and negatively impacting trout habitat and spawning grounds.		
Action or Project Intended for Implementation			
Description of the Solution	Dimensional rock rip rap shall be strategically placed within and along Panther Lick to stabilize the streambanks and stream bed. In addition, plantings shall be integrated with the rock work.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	Medium	Estimated Benefits (losses avoided)	Reduced sediment load; improved trout habitat (including spawning grounds); Increased hydraulic capacity of downstream stream channel
Useful Life	50 years		
Estimated Cost	\$260,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grant and in-kind/local sources
Responsible Organization	Village of Millport	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Unacceptable erosion & sedimentation
	Replacement of Stream Channel with a large box culvert	>\$1,000,000	Elimination of stream would not be permissible with NYSDEC
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Floodplain Management		Village of Millport – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Village of Millport	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		Village of Millport – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Village of Millport Flood Insurance Rate Maps were developed from a limited flood study and currently have no base flood elevations. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Village of Millport	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	VILLAGE OF MILLPORT
Capital Improvements Plan	
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	
Economic Development Plan	
Emergency Operations Plan	
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	
Real Estate Disclosure Requirements	
Site Plan Review Requirements	
Stormwater Ordinance	
Subdivision Regulations	
Watershed Ordinance	

ANNEX L: VILLAGE OF MILLPORT

COMMUNITY CAPABILITY CHECKLIST	VILLAGE OF MILLPORT
Zoning Ordinance/Land Use Restrictions	
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	
Public Education/Awareness Programs	
Stream Maintenance Program	
Storm Drainage Systems Maintenance Program	
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	x
Environmental Conservation Specialist	x
Floodplain Administrator	x
GIS Specialist	x
Personnel with Hazard Knowledge	x
Planner	x
Public Information Official	x
Resource Development/Grant Writer	

ANNEX M: TOWN OF SOUTHPORT

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JURISDICTION PROFILE

OVERVIEW

The Town of Southport is located in Chemung County, New York, with a population just under 11,000. The town is located in the southwest corner of Chemung County and is southwest of the City of Elmira. It is part of the Elmira Metropolitan Statistical Area. According to the United States Census Bureau, the town has a total area of 46.8 square miles, of which 46.4 square miles is land and 0.42 square miles, or 0.91%, is water. Figure M-1 shows the general location of the Town of Southport.

TOWN OF SOUTHPORT CONTACT INFORMATION

Name: Kathy Szerszen

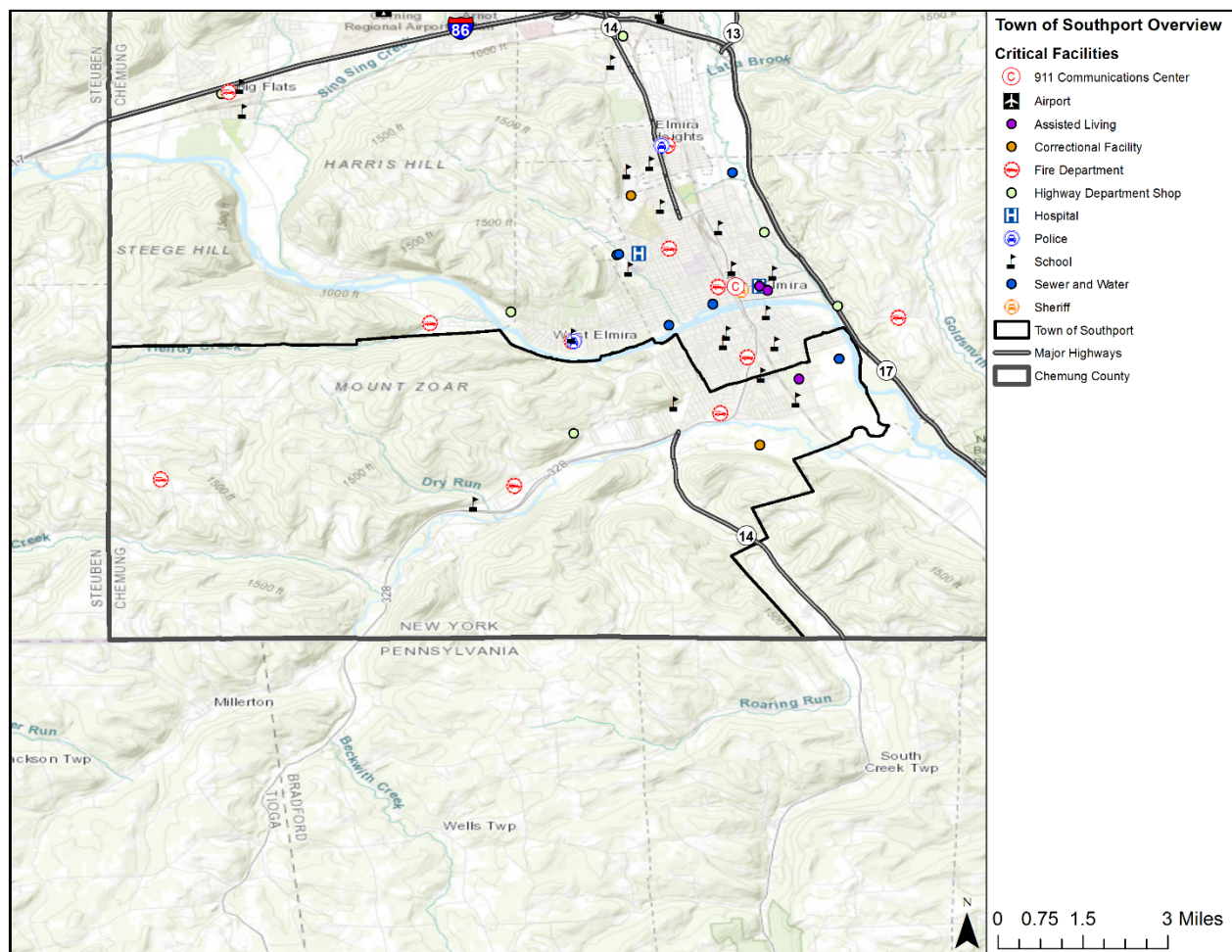
Title: Mayor/Supervisor

Phone: (607)734-1548

Address: 1139 Pennsylvania Ave, Elmira, NY
14904

Email: kszerszen@townofsouthport.com

Figure M-1. Town of Southport Planning Area



POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Town of Southport had a population of 10,940 residents. Table M-1 provides the population distribution within the Town of Southport.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table M-1. Population Distribution for the Town of Southport

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Southport	10,940	12.3%	1,837	1,198

POPULATION GROWTH

The official 2010 Town of Southport population is 10,940. Overall, the Town of Southport experienced a decrease in population between 1980 and 2010 by 5.6%, or a decrease of 646 people. Table M-2 provides historic change rates in the Town of Southport.

Table M-2. Population for the Town of Southport, 1980-2010

JURISDICTION	1980 ²	1990 ³	2000 ⁴	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Town of Southport	11,586	11,571	11,185	10,940	-646	-5.6%	-245	-2.2%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Town of Southport might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table M-3, as provided Cornell University's Program on Applied Demographics⁵. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

³ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁴ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁵ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table M-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Town of Southport, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Town of Southport experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Town of Southport is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Town of Southport are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Town of Southport:

Table M-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Southport	1 Correctional Facility, 3 Fire Stations, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Water/Wastewater Facility

Population over 65 in the Town of Southport is estimated at 17.9% of the total population or an estimated total of 1,900⁶ potentially vulnerable residents in the planning area based on age (Table M-5).

⁶ US Census Bureau 2016 data for the Town of Southport.

Table M-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Town of Southport	1,900

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table M-6 depicts historical occurrences of thunderstorm wind events for the Town of Southport according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 6 thunderstorm wind events are known to have impacted the Town of Southport, based upon NCEI records.

Table M-6. Historical Thunderstorm Wind Events, 1955-2018⁷⁸

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Southport	11/16/2006	2:50 PM	50	0	0	\$3,746	\$0
Town of Southport	8/25/2007	6:50 PM	50	0	0	\$0	\$0
Town of Southport	5/16/2009	3:30 PM	50	0	0	\$0	\$0
Town of Southport	5/26/2011	3:50 PM	50	0	0	\$5,567	\$0
Town of Southport	5/27/2011	6:30 PM	50	0	0	\$55,670	\$0
Town of Southport	6/23/2015	6:30 AM	50	0	0	\$3,163	\$0
Town of Southport Totals				0	0	\$68,145	

Based on the list of historical thunderstorm wind events for the Town of Southport, one of the reported events has occurred since the 2012 Plan.

⁷ Damages are reported from January 1955 through June 2018.

⁸ Magnitude is listed when available. Damage values are in 2018 dollars.

Figure M-2. Historical Hail Events, 1955-2018



Table M-7. Historical Hail Events, 1955-2018⁹¹⁰

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Southport	7/9/1999	8:12 PM	0.75	0	0	\$0	\$0
Town of Southport	5/26/2011	3:50 PM	1.0	0	0	\$5,567	\$0
Town of Southport	7/17/2008	12:03 PM	0.75	0	0	\$0	\$0
Town of Southport	5/26/2011	2:42 PM	0.75	0	0	\$0	\$0
Town of Southport	5/26/2011	3:46 PM	1.0	0	0	\$0	\$0
Town of Southport Totals				0	0	\$5,567	

Based on the list of historical hail events for the Town of Southport, no reported events have occurred since the 2012 Plan.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the Town of Southport. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Southport can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Town of Southport is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 85 manufactured homes (approximately 1.7%) located in the Town of Southport (Table M-8). In addition, 91.3% (approximately 4,447 structures) of the residential structures in the Town of Southport were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

⁹ Damages are reported from January 1955 through June 2018.

¹⁰ Magnitude is listed when available. Damage values are in 2018 dollars.

Table M-8. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Southport	85	4,447

The following critical facilities (Table M-9) would be vulnerable to thunderstorm events in the Town of Southport:

Table M-9. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Southport	1 Correctional Facility, 3 Fire Stations, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Water/Wastewater Facility

Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Southport has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Southport would be "Limited," with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$73,712 having an approximate annual loss estimate of \$1,161 (Table M-10).

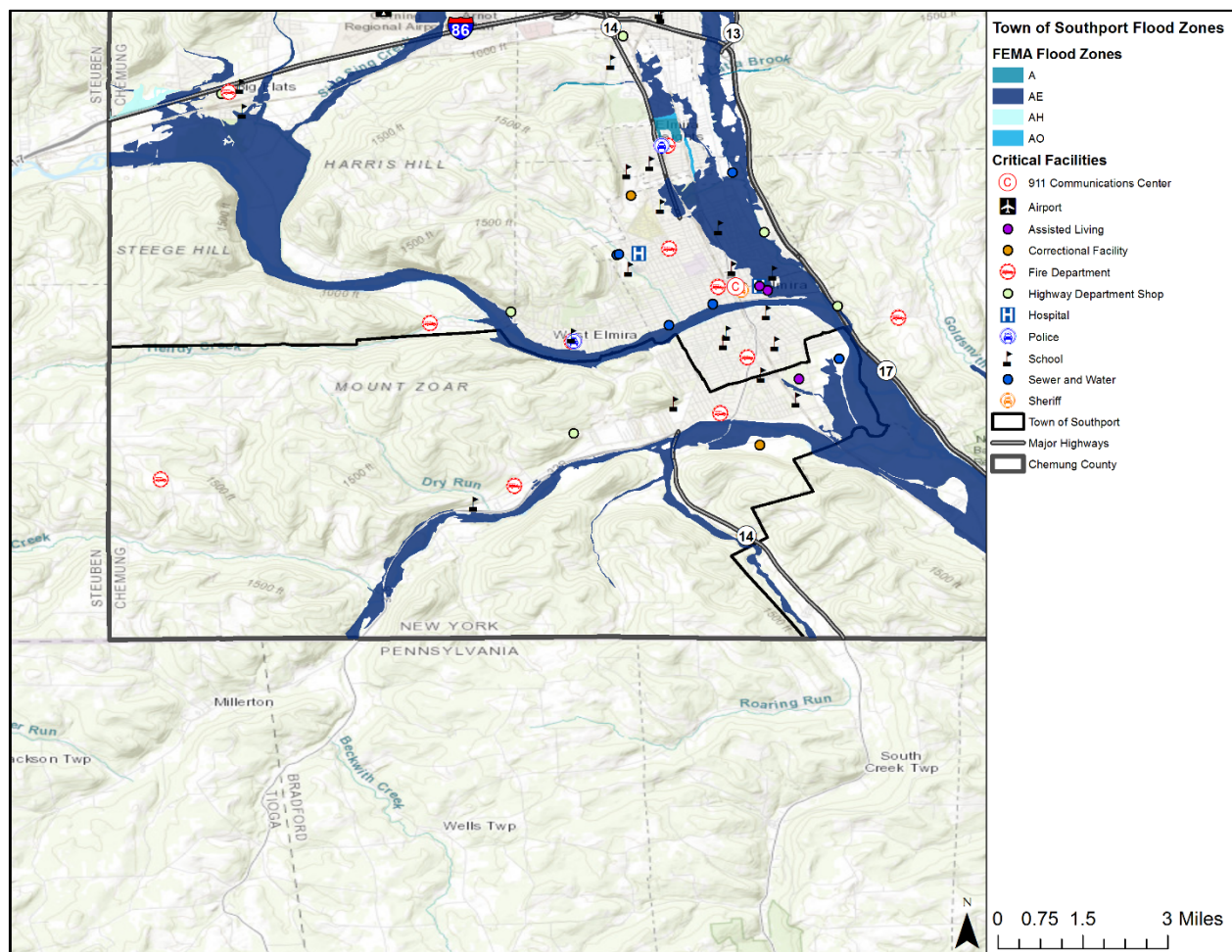
Table M-10. Potential Annualized Losses for the Town of Southport

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Southport	\$73,712	\$1,161

FLOOD

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. Full flood zone delineations with elevations are available in the Town of Southport. The location of estimated flood zones for the Town of Southport, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure M-3.

Figure M-3. Estimated Flood Zones in the Town of Southport

HISTORICAL OCCURRENCES

Table M-11 depicts historical occurrences of flood events for the Town of Southport according to the National Centers for Environmental Information (NCEI) data. From January 1996 to June 2018, 2 flood events were known to have impacted the Town of Southport, based upon NCEI records. Flood events are often reported on a county-wide basis, or under-reported for individual municipalities.

Table M-11. Historical Flood Events, 1996-2018¹¹

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Southport	12/1/1996	0	0	\$15,863	\$0
Town of Southport	8/9/2003	0	0	\$1,022,161	\$0
Town of Southport Totals		0	0	\$1,038,024	

Based on the list of historical flood events for the Town of Southport, no reported events have occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Southport can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Town of Southport is highly likely.

VULNERABILITY AND IMPACT

Table M-12 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table M-12. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Town of Southport	1 Fire Station

Historic loss estimates due to flood are presented in Table M-13 below.

Table M-13. Potential Annualized Losses, 1996-2018¹²

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Southport	2	0	0	\$1,038,024	\$46,134

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table M-14 depicts the level of impact for the Town of Southport.

¹¹ Values are in 2018 dollars. Events reported from January 1996 through June 2018.

¹² Events reported from January 1996 through June 2018.

Table M-14 Town of Southport Impact

JURISDICTION	IMPACT	DESCRIPTION
Town of Southport	Limited	The Town of Southport could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Town of Southport currently participates in the National Flood Insurance Program as well as the Community Rating System and has in place a flood damage prevention ordinance that includes standards above the minimum FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Town of Southport has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Town of Southport as a moderate risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. The Town of Southport has a designated floodplain administrator. The Town of Southport floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the Town of Southport outlines the minimum requirements for development in special flood hazard areas. Table M-15 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table M-15. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Town of Southport	N/A	04/26/2013	Good Standing	49

REPETITIVE LOSS

Table M-16 shows repetitive loss and severe repetitive loss properties for the Town of Southport.

Table M-16. Repetitive Loss and Severe Repetitive Loss Properties

JURISDICTION	BUILDING TYPE	NUMBER OF STRUCTURES	NUMBER OF LOSSES
Town of Southport	Single Family	2	4
Town of Southport	Other	1	3

TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of tornado events for the Town of Southport. Historical tornado events are often provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities, such as the Town of Southport, are impacted. Tornado events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Town of Southport can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Town of Southport is likely.

VULNERABILITY AND IMPACT

The U.S. Census data indicates a total of 85 manufactured homes (Table M-17) located in the Town of Southport (1.7% of housing units). In addition, 91.3% (approximately 4,447 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table M-17. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Southport	85	4,447

The following critical facilities would be vulnerable to tornado events in the Town of Southport:

Table M-18. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Southport	1 Correctional Facility, 3 Fire Stations, 1 Highway Department Shop, 1 Assisted Living Facility, 1 Water/Wastewater Facility

The average loss estimate of property and crop is \$0 (in 2018 dollars), having an approximate annual loss estimate of \$0 (Table M-19). Based on historic loss and damages, the impact of tornado on the Town of Southport can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table M-19. Potential Annualized Losses, 1983-2018¹³

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Southport	\$0	\$0

LANDSLIDE

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 9) provides a hazard description, location and extent of the landslide hazard for all participating jurisdictions. The Town of Southport has one known area susceptible or prone to landslide. According to the planning team, an active landslide area is located on the east side of Seeley Creek near Pine City in the Town of Southport. The area is an unvegetated slope that typically deposits sediment into the creek but has not experienced large scale or catastrophic motion. The area subject to landslide is considered to pose a minimal threat. This is the only known area subject to landslide within the Town of Southport.

Landslide susceptibility is defined as the degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. It can be assumed that unusually high precipitation or changes in existing conditions can initiate landslides in areas where rocks and soils have experienced numerous landslides in the past. Only potentially affected areas are identified by landslide susceptibility, not a time frame for when a landslide might occur. The same percentages that are used for landslide incidence are used for landslide susceptibility (high= 15+%, medium 1.5-15%, low 0-1.5%).

According to the New York State Hazard Mitigation Plan, the entire population in the Town of Southport is at a low risk of incidence and low risk for landslide susceptibility (0-1.5%).

HISTORICAL OCCURRENCES

The New York State Hazard Mitigation Plan indicates no previous landslide events or reported damages due to landslides in the Chemung County Planning Area. However, team input and previous mitigation planning cycles for the county indicate one documented landslide in the Town of Southport (Table M-20).

¹³ Events recorded from January 1983 through June 2018.

Table M-20. Historical Landslide Events, 1960-2018¹⁴

JURISDICTION	NUMBER OF EVENTS	YEAR	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Southport	1	Unknown/ Ongoing	0	0	\$0	\$0
TOTAL LOSSES	1		0	0	\$0	

PROBABILITY OF FUTURE EVENTS

Based on available records of historic events, 1 known historic events in a 59-year reporting period for the Town of Southport provides a probability of one event every ten years. This frequency supports an unlikely probability of future events for the Town of Southport.

VULNERABILITY AND IMPACT

According to the New York State Hazard Mitigation Plan, the entire population in the Chemung County Planning Area is at a low risk of incidence. The only known landslide within the Town of Southport is located in an undeveloped area along the banks of Seeley Creek and poses no threat to structures, infrastructure or populations. No critical facilities in the Town of Southport is considered vulnerable to landslide.

The impact of landslides experienced in the Town of Southport has resulted in no known damages and no injuries or fatalities, supporting a limited severity of impact meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10 percent of property is destroyed or with major damage.

¹⁴ Damages are reported from January 1960 through June 2018.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood-1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Wetland creation projects, at least 2 projects on private properties 2. Pa border to first bridge at Rt. 328 3. Rt. 328 bridge to Penn Ave bridge 4. Penn Ave bridge to Rt. 14 bridge 5. Rt. 14 bridge to T/Ashland line.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project 1, 4 and 5 are complete. Project 2 and 3 are not complete. Action will be included in Plan Update.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in Floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Funding not secured. Action will be included in Plan Update.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the Stormwater Coalition and STC for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Updated zoning law includes a Conservation Zone that prohibits new buildings in the floodway, stream protections in Riparian Buffer, and Setback Areas along all perennial streams. Project is ongoing.
Flood-14	Educate on Flood Mitigation Techniques	Flood	Promote the use of flood proofing techniques for retrofitting existing flood-prone development by distributing educational materials. Code Enf/Fldpln Admins have taken a continuing education course, and have educational packets created by Chemung County and STC with Mitigation Grant funds.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Materials have been made available on the County website and brochures are provided for annual mailings to residence. Project is county wide.

NEW MITIGATION ACTIONS

Emergency Generator for Town of Southport Town Hall		Town of Southport – 1	
Risk/Vulnerability			
Hazard of Concern	Flood, Thunderstorm, Winter Storm, Tornado		
Description of the Problem	During flooding, thunderstorm wind (including hail and lightning), severe winter storms and tornados, the Town Hall serves as the Emergency Operations Center (EOC) as well. Power outages are likely and render the facility useless. Within the Town Hall, there are lights, computers, heat, communications, etc., which all rely on electricity.		
Action or Project Intended for Implementation			
Description of the Solution	Installation of an emergency generator with hardwired quick connections for the Town Hall		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	The Town Hall and Emergency Operations Center will remain operational during power outages.
Useful Life	50 yrs.		
Estimated Cost	\$250,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Southport	Local Planning Mechanisms to be Used in Implementation, if any	Town improvements schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make building generator ready	\$100,000.00	Would still be without power until a generator from State is requested through Emergency Management.
	Try to find another facility with power to use as EOC	Dependent on facility being used	Would have to move all operations to another location. Impractical to move EOC to another location.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Town of Southport – 2	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Southport	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Stream Mitigation		Town of Southport – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Streams located on the Pennsylvania border to first bridge at Rt 328 and Rt 328 bridge to Penn Ave bridge have experienced significant erosion after previous flood events.		
Action or Project Intended for Implementation			
Description of the Solution	Streambank stabilization, detention basin creation, and gravel/debris removal will improve the integrity of the streams.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	Stream mitigation work will protect the roadway, resulting in improved reliability and safety for motorists.
Useful Life	60 years		
Estimated Cost	\$220,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Southport	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Injuries or fatalities may occur; repetitive damages and roadway repairs will continue
	Concrete lined roadside ditches	\$25,000,000	Not cost beneficial
	Proposed Action	\$220,000	Reduce or eliminate damages; protect motorists
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX M: TOWN OF SOUTHPORT

Buyout Damaged Properties		Town of Southport – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Homes have sustained repetitive flood losses. The Town of Southport has offered to assist the occupants with the buyout process. Will need to secure grant funding to proceed.		
Action or Project Intended for Implementation			
Description of the Solution	Buyout homes in the highest risk floodplain areas in order to relocate residents to safer locations, permanently eliminate the risk of repetitive damage to homes, and restore natural floodplain functions. The Town of Southport will identify willing sellers, pursue grant funding, and assist with the buyout process.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	Reduce the damage to residential property and the disruption to life caused by repeated flooding.
Useful Life	60 years		
Estimated Cost	>\$1,000,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Southport	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Continuing repetitive losses; Residents remain in harm's way; Emergency services required in high risk areas
	Relocate homes	>\$2,000,000	Less cost effective; Less feasible option due to age of structures
	Proposed Action	>\$1,000,000 (Depending on the number of willing participants)	Cost effective alternative; No residual risk
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Floodplain Management		Town of Southport – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Town of Southport	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		Town of Southport – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Southport Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Southport	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	TOWN OF SOUTHPORT
Capital Improvements Plan	
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	
Economic Development Plan	
Emergency Operations Plan	
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	
Real Estate Disclosure Requirements	
Site Plan Review Requirements	
Stormwater Ordinance	
Subdivision Regulations	
Watershed Ordinance	

COMMUNITY CAPABILITY CHECKLIST	TOWN OF SOUTHPORT
Zoning Ordinance/Land Use Restrictions	
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	
Public Education/Awareness Programs	
Stream Maintenance Program	
Storm Drainage Systems Maintenance Program	
Storm Ready Community	x
Building Code Official	
Emergency Manager	x
Engineer/Public Works Official	
Environmental Conservation Specialist	
Floodplain Administrator	x
GIS Specialist	
Personnel with Hazard Knowledge	
Planner	
Public Information Official	
Resource Development/Grant Writer	

ANNEX N: TOWN OF VAN ETTEN

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JURISDICTION PROFILE

OVERVIEW

The Town of Van Etten is located in Chemung County, New York, with a population just under 1,600. The town is at the northeast corner of the county, northeast of Elmira. It is part of the Elmira Metropolitan Statistical Area. According to the United States Census Bureau, the town has a total area of 41.6 square miles, of which 41.4 square miles is land and 0.2 square miles, or 0.30%, is water. Figure N-1 shows the general location of the Town of Van Etten.

TOWN OF VAN ETTEN CONTACT INFORMATION

Name: George Keturi

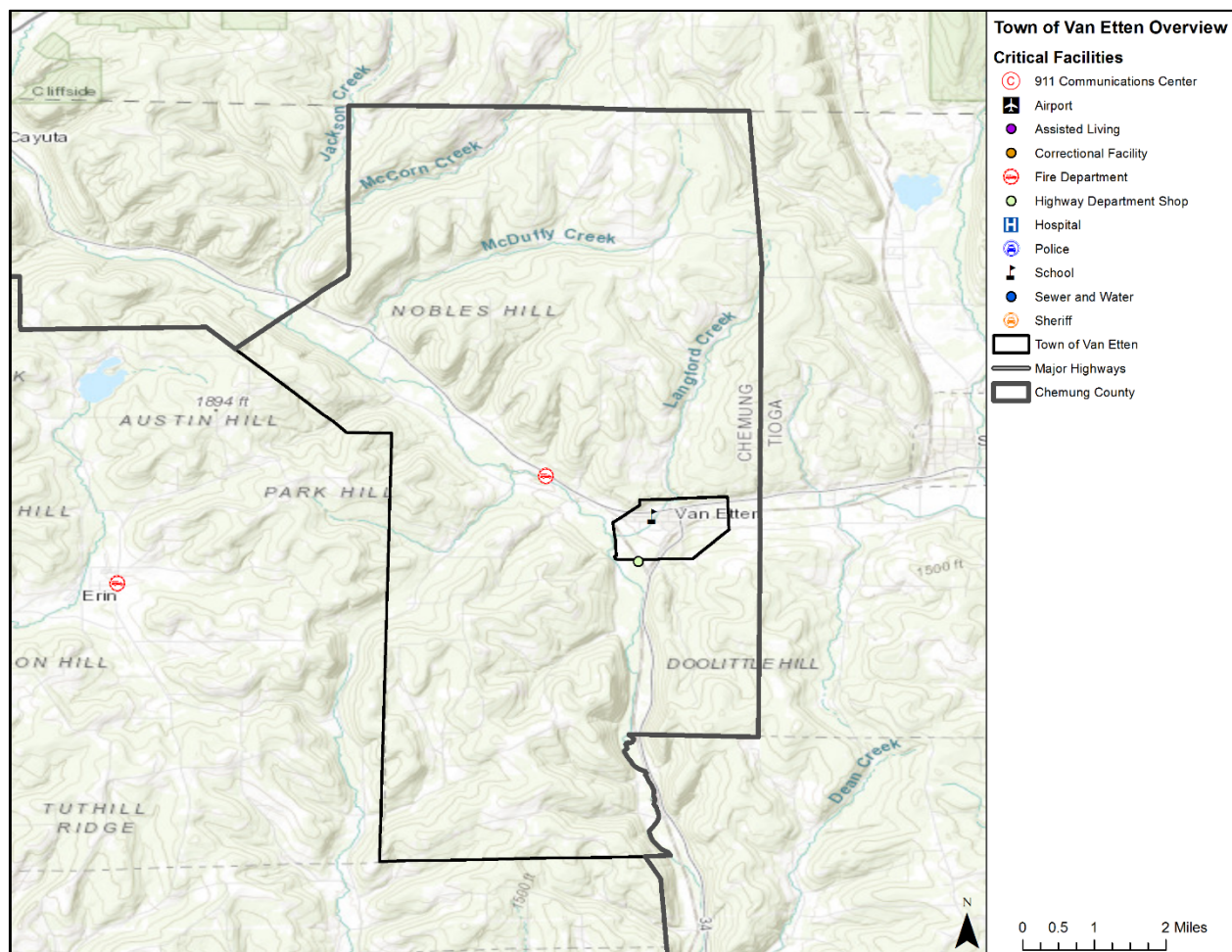
Title: Mayor/Supervisor

Phone: (607)589-4435

Address: P.O. Box 177, 83 Main Street, Van Etten, NY 14889

Email: geoswim@frontiernet.net

Figure N-1. Town of Van Etten Planning Area



POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Town of Van Etten had a population of 1,557 residents. Table N-1 provides the population distribution within the Town of Van Etten.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table N-1. Population Distribution for the Town of Van Etten

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Van Etten	1,557	1.8%	206	181

POPULATION GROWTH

The official 2010 Town of Van Etten population is 1,557. Overall, the Town of Van Etten experienced an increase in population between 1980 and 2010 by 2.5%, or an increase of 38 people. Table N-2 provides historic change rates in the Town of Van Etten.

Table N-2. Population for the Town of Van Etten, 1980-2010

JURISDICTION	1980 ²	1990 ³	2000 ⁴	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Town of Van Etten	1,519	1,507	1,518	1,557	38	2.5%	39	2.6%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Town of Van Etten might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table N-3, as provided Cornell University's Program on Applied Demographics⁵. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

³ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁴ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁵ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table N-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Town of Van Etten, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Town of Van Etten experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Town of Van Etten is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Town of Van Etten are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Town of Van Etten:

Table N-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Van Etten	1 Fire Station, 1 Highway Department Shop, 1 School

Population over 65 in the Town of Van Etten is estimated at 15.0% of the total population or an estimated total of 260⁶ potentially vulnerable residents in the planning area based on age (Table N-5).

⁶ US Census Bureau 2016 data for the Town of Van Etten.

Table N-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Town of Van Etten	260

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table N-6 depicts historical occurrences of thunderstorm wind events for the Town of Van Etten according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 2 thunderstorm wind events are known to have impacted the Town of Van Etten, based upon NCEI records.

Table N-6. Historical Thunderstorm Wind Events, 1955-2018⁷⁸

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Van Etten	7/6/1995	2:40 PM	Unknown	0	0	\$4,949	\$0
Town of Van Etten	11/16/2006	2:50 PM	50	0	0	\$6,243	\$0
Town of Van Etten Totals				0	4	\$11,192	

Based on the list of historical thunderstorm wind events for the Town of Van Etten, no reported events have occurred since the 2012 Plan.

HAIL

Historical evidence shown in Figure N-2 demonstrates that the Town of Van Etten is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Table N-7 depicts historical occurrences of hail events for the Town of Van Etten according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 3 hail events are known to have impacted the Town of Van Etten, based upon NCEI records. Historical hail events are often provided on a county-wide

⁷ Damages are reported from January 1955 through June 2018.

⁸ Magnitude is listed when available. Damage values are in 2018 dollars.

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basis in the NCEI database. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

Figure N-2. Historical Hail Events, 1955-2018

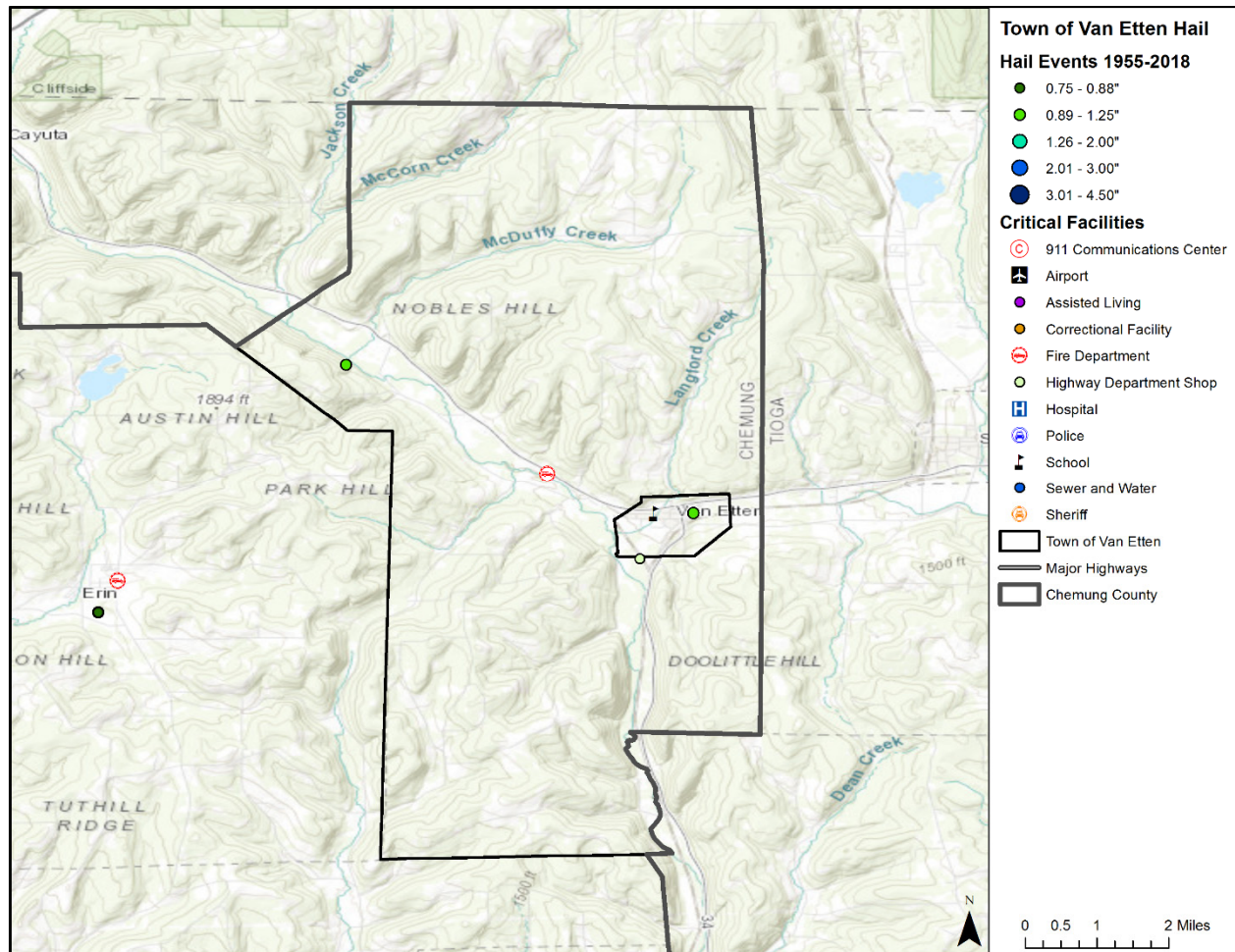


Table N-7. Historical Hail Events, 1955-2018⁹¹⁰

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Van Etten	5/31/2002	3:12 PM	0.75	0	0	\$0	\$0
Town of Van Etten	6/24/2013	1:29 PM	1.0	0	0	\$0	\$0
Town of Van Etten	8/5/2014	2:29 PM	1.0	0	0	\$0	\$0

⁹ Damages are reported from January 1955 through June 2018.

¹⁰ Magnitude is listed when available. Damage values are in 2018 dollars.

JURISDICTION	DATE	TIME	MAGNITUDE (Diameter Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Van Etten Totals				0	0	\$0	

Based on the list of historical hail events for the Town of Van Etten, two of the reported events have occurred since the 2012 Plan.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the Town of Van Etten. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Van Etten can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Town of Van Etten is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 192 manufactured homes (approximately 27.6%) located in the Town of Van Etten (Table N-8). In addition, 67.4% (approximately 469 structures) of the residential structures in the Town of Van Etten were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table N-8. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Van Etten	192	469

The following critical facilities (Table N-9) would be vulnerable to thunderstorm events in the Town of Van Etten:

Table N-9. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Van Etten	1 Fire Station, 1 Highway Department Shop, 1 School

Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Van Etten has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Van Etten would be "Limited," with minor quality of life lost, injuries

treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$11,192 having an approximate annual loss estimate of \$176 (Table N-10).

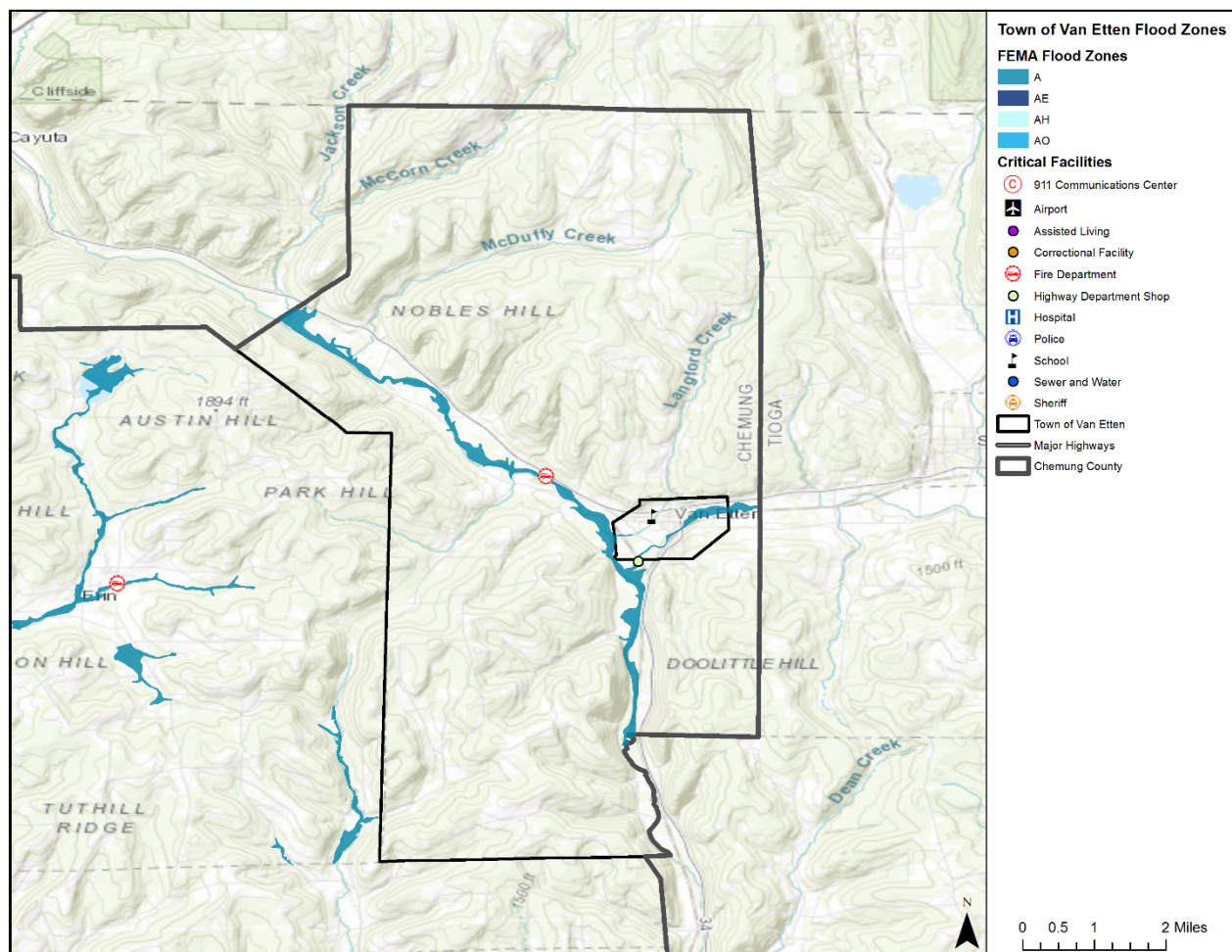
Table N-10. Potential Annualized Losses for the Town of Van Etten

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Van Etten	\$11,192	\$176

FLOOD

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. A limited flood hazard boundary map with no elevations is available for the Town of Van Etten. The location of estimated flood zones for the Town of Van Etten, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure N-3.

Figure N-3. Estimated Flood Zones in the Town of Van Etten

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of flood events for the Town of Van Etten. Historical flood events may be reported on a county-wide basis, specifically when it comes to smaller communities with limited capacity. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for participating jurisdictions. According to historical records for the Chemung County Planning Area, the Town of Van Etten can expect to experience a flood event every year.

PROBABILITY OF FUTURE EVENTS

Incidents reported at the county level provide a more robust risk assessment for every participating jurisdiction, particularly smaller jurisdictions. According to historical records for the Chemung County Planning Area, the Town of Van Etten can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Town of Van Etten is highly likely.

VULNERABILITY AND IMPACT

Table N-11 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table N-11. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Town of Van Etten	1 Fire Station

Historic loss estimates due to flood are presented in Table N-12 below.

Table N-12. Potential Annualized Losses, 1996-2018¹¹

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Van Etten	0	0	0	\$0	\$0

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table N-13 depicts the level of impact for the Town of Van Etten.

Table N-13 Town of Van Etten Impact

JURISDICTION	IMPACT	DESCRIPTION
Town of Van Etten	Limited	The Town of Van Etten could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Town of Van Etten currently participates in the National Flood Insurance Program and is in good standing. The community has in place a flood damage prevention ordinance that includes standards that meet the minimum standard FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Town of Van Etten has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Town of Van Etten as a moderate to high risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. The Town of Van Etten has a designated floodplain administrator. The Van Etten floodplain

¹¹ Events reported from January 1996 through June 2018.

administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the Town of Van Etten outlines the minimum requirements for development in special flood hazard areas. Table N-14 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table N-14. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Town of Van Etten	03/27/2007	3/16/2012	Good Standing	2

REPETITIVE LOSS

The Town of Van Etten currently has no repetitive loss or severe repetitive loss properties.

TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of tornado events for the Town of Van Etten. Historical tornado events are often provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities, such as the Town of Van Etten, are impacted. Tornado events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Town of Van Etten can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Town of Van Etten is likely.

VULNERABILITY AND IMPACT

The U.S. Census data indicates a total of 192 manufactured homes (Table N-15) located in the Town of Van Etten (27.6% of housing units). In addition, 67.4% (approximately 469 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table N-15. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Van Etten	192	469

The following critical facilities would be vulnerable to tornado events in the Town of Van Etten:

Table N-16. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Van Etten	1 Fire Station, 1 Highway Department Shop, 1 School

The average loss estimate of property and crop is \$0 (in 2018 dollars), having an approximate annual loss estimate of \$0 (Table N-17). Based on historic loss and damages, the impact of tornado on the Town of Van Etten can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table N-17. Potential Annualized Losses, 1983-2018¹²

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Van Etten	\$0	\$0

LANDSLIDE

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 9) provides a hazard description, location and extent of the landslide hazard for all participating jurisdictions. The Town of Van Etten has one known area susceptible or prone to landslide. According to the planning team, a small landslide area exists on a slope along a feeder creek to Cayuta Creek, on Crammer Hollow Road. The creek is located in a residential neighborhood and poses a minimal threat to residential parcels close to the embankment. This is the only known area subject to landslide within the Town of Van Etten.

Landslide susceptibility is defined as the degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. It can be assumed that unusually high precipitation or changes in existing conditions can initiate landslides in areas where rocks and soils have experienced numerous landslides in the past. Only potentially affected areas are identified by landslide susceptibility, not a time frame for when a landslide might occur. The same percentages that are used for landslide incidence are used for landslide susceptibility (high= 15+%, medium 1.5-15%, low 0-1.5%).

According to the New York State Hazard Mitigation Plan, the entire population in the Town of Van Etten is at a low risk of incidence and low risk for landslide susceptibility (0-1.5%).

¹² Events recorded from January 1983 through June 2018.

HISTORICAL OCCURRENCES

The New York State Hazard Mitigation Plan indicates no previous landslide events or reported damages due to landslides in the Chemung County Planning Area. However, team input and previous mitigation planning cycles for the county indicate one documented landslide in the Town of Van Etten (Table N-18). While no dollar damage amount has been assigned to the event, erosion to the impacted parcel has been reported as a result of the landslide. No damages to structures or infrastructure was reported.

Table N-18. Historical Landslide Events, 1960-2018¹³

JURISDICTION	NUMBER OF EVENTS	YEAR	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Van Etten	1	2011	0	0	\$0	\$0
TOTAL LOSSES	1		0	0	\$0	

PROBABILITY OF FUTURE EVENTS

Based on available records of historic events, 1 known historic events in a 59 year reporting period for the Town of Van Etten provides a probability of one event every ten years. This frequency supports an unlikely probability of future events for the Town of Van Etten.

VULNERABILITY AND IMPACT

According to the New York State Hazard Mitigation Plan, the entire population in the Chemung County Planning Area is at a low risk of incidence. The only known landslide within the Town of Van Etten is located in a residential area and poses no threat to structures, infrastructure or populations. No critical facilities in the Town of Van Etten is considered vulnerable to landslide.

The impact of landslides experienced in the Town of Van Etten has resulted in no known structural damages and no injuries or fatalities, supporting a limited severity of impact meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10 percent of property is destroyed or with major damage.

¹³ Damages are reported from January 1960 through June 2018.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood-1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Beckhorn Hollow, Langford Creek projects were completed. Other areas are not complete. Action will be included in Plan Update.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Funding not secured. Action will be included in Plan Update.

NEW MITIGATION ACTIONS

Rumsey Hill Road Culvert Replacement		Town of Van Etten – 1	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Rumsey Hill Road culvert is frequently overtopped during storm events, resulting in downstream damage. The hydraulic capacity of this structure does not comply with commonly accepted standards.		
Action or Project Intended for Implementation			
Description of the Solution	The existing Rumsey Hill Road culvert shall be replaced with a new box culvert (of appropriate hydraulic capacity) to accommodate an appropriate design storm event return period. Also, stacked rock headwalls (on the entrance and exit ends of the culvert) shall be installed.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A new box culvert will provide increased performance, reliability, and safety for motorists.
Useful Life	50 years		
Estimated Cost	\$250,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	2-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Van Etten	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Replace existing culvert with bridge structure (concrete abutments & steel superstructure)	>\$330,000	More expensive than box culvert replacement
	Eliminate Rumsey Hill Road crossing	>\$20,000	Not practicable. Crossing is necessary to provide required roadway access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Cooper Hill Road Roadside Slope Stabilization		Town of Van Etten – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	A section of Cooper Hill Road is located at the top of a steep slope with a stream at the toe of this slope. This stream has/is eroding the toe of this slope, causing a slope failure that threatens the roadway of Cooper Hill Road. A collapse of the roadway would present hazards to motorists, as well as blocking emergency access routes.		
Action or Project Intended for Implementation			
Description of the Solution	To stabilize the slope failure, a reinforced soil slope shall be constructed to better support the roadway of Cooper Hill Road. In addition, the toe of the slope along the stream shall be armored with a stacked rock wall, to prevent erosion of the toe of slope.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	A reinforced soil slope with a stacked rock wall at the toe of slope would stabilize the slope failure and would protect the roadway, resulting in improved reliability and safety for motorists.
Useful Life	60 years		
Estimated Cost	\$220,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Van Etten	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Utilization of driven sheet piling to construct a retaining wall system	>\$350,000	More expensive than the reinforced soil slope (with rock facing) alternative
	Eliminate portion of Rumsey Hill Road impacted by stream	>\$30,000	Not practicable. The roadway must be continuous to provide required access.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Town of Van Etten – 3	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Van Etten	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Buyout Damaged Properties		Town of Van Etten – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Homes have sustained repetitive flood losses. The Town of Van Etten has offered to assist the occupants with the buyout process. Will need to secure grant funding to proceed.		
Action or Project Intended for Implementation			
Description of the Solution	Buyout homes in the highest risk floodplain areas in order to relocate residents to safer locations, permanently eliminate the risk of repetitive damage to homes, and restore natural floodplain functions. The Town of Van Etten will identify willing sellers, pursue grant funding, and assist with the buyout process.		
Is this Project related to a Critical Facility?		Yes	No
Level of Protection	50-year storm event (approx.)	Estimated Benefits (losses avoided)	Reduce the damage to residential property and the disruption to life caused by repeated flooding.
Useful Life	60 years		
Estimated Cost	>\$1,000,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1-year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Town of Van Etten	Local Planning Mechanisms to be Used in Implementation, if any	Town Highway Improvements Schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Continuing repetitive losses; Residents remain in harm's way; Emergency services required in high risk areas
	Relocate homes	>\$2,000,000	Less cost effective; Less feasible option due to age of structures
	Proposed Action	>\$1,000,000 (Depending on the number of willing participants)	Cost effective alternative; No residual risk
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		Town of Van Etten – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Van Etten Flood Insurance Rate Maps were developed from a limited flood study and currently have no base flood elevations. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Van Etten	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	TOWN OF VAN ETTEN
Capital Improvements Plan	
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	
Economic Development Plan	
Emergency Operations Plan	
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	
Real Estate Disclosure Requirements	
Site Plan Review Requirements	
Stormwater Ordinance	
Subdivision Regulations	
Watershed Ordinance	

COMMUNITY CAPABILITY CHECKLIST	TOWN OF VAN ETTEN
Zoning Ordinance/Land Use Restrictions	
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	
Public Education/Awareness Programs	
Stream Maintenance Program	
Storm Drainage Systems Maintenance Program	
Storm Ready Community	x
Building Code Official	
Emergency Manager	x
Engineer/Public Works Official	
Environmental Conservation Specialist	
Floodplain Administrator	x
GIS Specialist	
Personnel with Hazard Knowledge	
Planner	
Public Information Official	
Resource Development/Grant Writer	

ANNEX O: TOWN OF VETERAN

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JURISDICTION PROFILE

OVERVIEW

The Town of Veteran is located in Chemung County, New York, with a population just over 3,300. The name of the town honors the first settler, a veteran of two wars. The town is on the county's north border and is north of Elmira. Veteran is part of the Elmira Metropolitan Statistical Area. The north town line is the border of Schuyler County. According to the United States Census Bureau, the town has a total area of 38.5 square miles, of which 38.3 square miles is land and 0.2 square miles, or 0.37%, is water. Figure O-1 shows the general location of the Town of Veteran.

TOWN OF VETERAN CONTACT INFORMATION

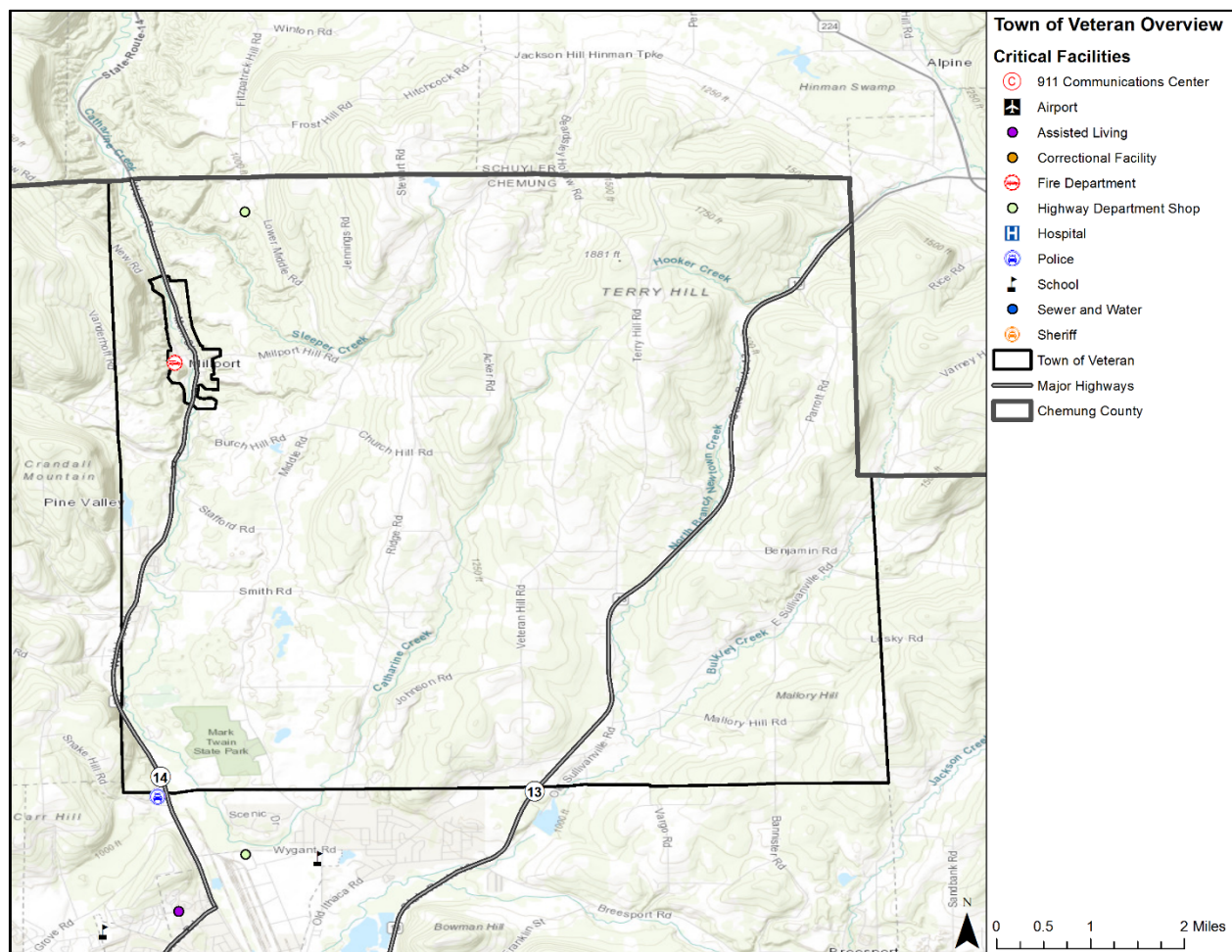
Name: William Winkky

Title: Mayor/Supervisor

Phone: (607)739-1476

Address: 4049 Watkins Road, Millport, NY 14864

Email: vetclerk@stny.rr.com

Figure O-1. Town of Veteran Planning Area

POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Town of Veteran had a population of 3,313 residents. Table O-1 provides the population distribution within the Town of Veteran.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table O-1. Population Distribution for the Town of Veteran

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Town of Veteran	3,313	3.7%	544	308

POPULATION GROWTH

The official 2010 Town of Veteran population is 3,313. Overall, the Town of Veteran experienced a decrease in population between 1980 and 2010 by 13.8%, or a decrease by 272 people. Table O-2 provides historic change rates in the Town of Veteran.

Table O-2. Population for the Town of Veteran, 1980-2010

JURISDICTIONS	1980 ²	1990 ³	2000 ⁴	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANG E 2000- 2010	PERCENT OF CHANGE
Town of Veteran	1,967	1966	1,951	1,695	-272	-13.8%	-256	-13.1%

FUTURE DEVELOPMENT

To better understand how future growth and development in the Town of Veteran might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table O-3, as provided Cornell University's Program on Applied Demographics⁵. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

³ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁴ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁵ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table O-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Town of Veteran, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Town of Veteran experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Town of Veteran is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Town of Veteran are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Town of Veteran:

Table O-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Veteran	1 Fire Station, 1 Highway Department Shop

Population over 65 in the Town of Veteran is estimated at 24.9% of the total population or an estimated total of 814⁶ potentially vulnerable residents in the planning area based on age (Table O-5).

⁶ US Census Bureau 2016 data for the Town of Veteran.

Table O-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Town of Veteran	814

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table O-6 depicts historical occurrences of thunderstorm wind events for the Town of Veteran according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 1 thunderstorm wind event is known to have impacted the Town of Veteran, based upon NCEI records.

Table O-6. Historical Thunderstorm Wind Events, 1955-2018⁷⁸

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Veteran	6/13/1994	2:30 PM	0	0	0	\$8,500	\$0
Town of Veteran Totals				0	0	\$8,500	

Based on the list of historical thunderstorm wind events for the Town of Veteran, no reported events have occurred since the 2012 Plan.

HAIL

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of hail events for the Town of Veteran. Historical hail events are often provided on a county-wide basis in the NCEI database. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there has been one reported historical occurrences of lightning events for the Town of Veteran (Table O-7). Historical lightning events

⁷ Damages are reported from January 1955 through June 2018.

⁸ Magnitude is listed when available. Damage values are in 2018 dollars.

have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

Table O-7. Historical Lightning Events, 1996-2018⁹

JURISDICTION	DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Veteran	7/6/1999	5:35 PM	0	0	\$22,638	\$0
Town of Veteran Totals			0	0	\$22,638	

Based on the list of historical lightning events for the Town of Veteran, no reported events have occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Veteran can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Town of Veteran is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 188 manufactured homes (approximately 13.0%) located in the Town of Veteran (Table O-8). In addition, 80.0% (approximately 1,159 structures) of the residential structures in the Town of Veteran were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table O-8. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Veteran	188	1,159

The following critical facilities (Table O-9) would be vulnerable to thunderstorm events in the Town of Veteran:

Table O-9. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Veteran	1 Fire Station, 1 Highway Department Shop

⁹ Damages are reported from January 1996 through June 2018. Damage values are in 2018 dollars.

Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Veteran has resulted in four injuries and no fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Town of Veteran would be “Limited,” with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$31,138 having an approximate annual loss estimate of \$490 (Table O-10).

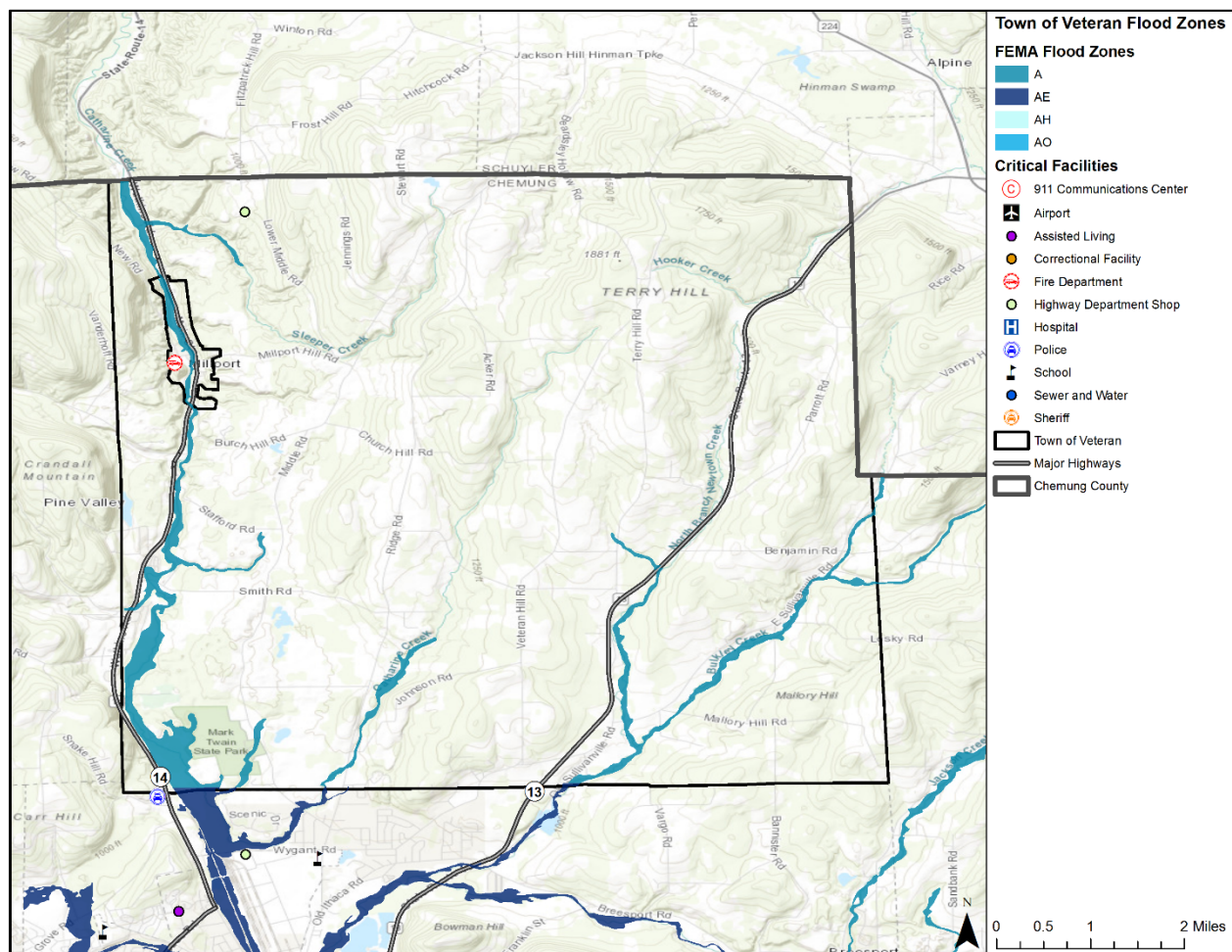
Table O-10. Potential Annualized Losses for the Town of Veteran

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Veteran	\$31,138	\$490

FLOOD

HAZARD DESCRIPTION, LOCATION AND EXTENT

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. A limited flood hazard boundary map with no elevations is available for the Town of Veteran. The location of estimated flood zones for the Town of Veteran, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure O-2.

Figure O-2. Estimated Flood Zones in the Town of Veteran

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of flood events for the Town of Veteran. Historical flood events may be reported on a county-wide basis, specifically when it comes to smaller communities with limited capacity. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for participating jurisdictions. According to historical records for the Chemung County Planning Area, the Town of Veteran can expect to experience a flood event every year.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Town of Veteran can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Town of Veteran is highly likely.

VULNERABILITY AND IMPACT

Table O-11 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table O-11. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Town of Veteran	None

Historic loss estimates due to flood are presented in Table O-12 below.

Table O-12. Potential Annualized Losses, 1996-2018¹⁰

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Veteran	0	0	0	\$0	\$0

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table O-13 depicts the level of impact for the Town of Veteran.

Table O-13 Town of Veteran Impact

JURISDICTION	IMPACT	DESCRIPTION
Town of Veteran	Limited	The Town of Veteran could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Town of Veteran currently participates in the National Flood Insurance Program as well as the Community Rating System and has in place a flood damage prevention ordinance that includes standards above the minimum FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Town of Veteran has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Town of Veteran as a high-risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. The Town of Veteran has a designated floodplain administrator. The Veteran floodplain administrator will continue to

¹⁰ Events reported from January 1996 through June 2018.

maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the Town of Veteran outlines the minimum requirements for development in special flood hazard areas. Table O-14 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table O-14. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Town of Veteran	N/A	05/04/2015	Good Standing	9

REPETITIVE LOSS

The Town of Veteran currently has no repetitive loss or severe repetitive loss properties.

TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of tornado events for the Town of Veteran. Historical tornado events are often provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities, such as the Town of Veteran, are impacted. Tornado events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Town of Veteran can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Town of Veteran is likely.

VULNERABILITY AND IMPACT

The U.S. Census data indicates a total of 188 manufactured homes (Table O-15) located in the Town of Veteran (13.0% of housing units). In addition, 80.0% (approximately 1,159 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table O-15. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Town of Veteran	188	1,159

The following critical facilities would be vulnerable to tornado events in the Town of Veteran:

Table O-16. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Town of Veteran	1 Fire Station, 1 Highway Department Shop

The average loss estimate of property and crop is \$0 (in 2018 dollars), having an approximate annual loss estimate of \$0 (Table O-17). Based on historic loss and damages, the impact of tornado on the Town of Veteran can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table O-17. Potential Annualized Losses, 1983-2018¹¹

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Town of Veteran	\$0	\$0

LANDSLIDE

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 9) provides a hazard description, location and extent of the landslide hazard for all participating jurisdictions. The Town of Veteran has one known area susceptible or prone to landslide. According to the planning team, a small landslide area exists on a steep hillside just above the Catherine Creek. Following the time of the landslide in 1994, the town decided to abandon the affected section of road. No further actions have been required to mitigate the hazard area since that time.

Burch Hill Road in the Town of Veteran has an 80-foot high embankment which slides when the soil becomes saturated. During the November 1996 flood, this sliding inhibited drainage and led to erosion of a gully 10 feet deep along the edge of the road. The gully was subsequently filled and the ditch was stabilized with fabric and rock. The high, unstable bank poses an ongoing threat. A tie wall stabilizing a section of the embankment fell in the past, allowing significant amounts of erosion at that site. Sediment from this unstable embankment is washed into Catharine Creek where it contributes to habitat degradation and channel instability. This is the only ongoing threat to the Town of Veteran due to landslide and is considered a minimal threat to the area.

Landslide susceptibility is defined as the degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. It can be assumed that unusually high

¹¹ Events recorded from January 1983 through June 2018.

precipitation or changes in existing conditions can initiate landslides in areas where rocks and soils have experienced numerous landslides in the past. Only potentially affected areas are identified by landslide susceptibility, not a time frame for when a landslide might occur. The same percentages that are used for landslide incidence are used for landslide susceptibility (high= 15+%, medium 1.5-15%, low 0-1.5%).

According to the New York State Hazard Mitigation Plan, the entire population in the Town of Veteran is at a low risk of incidence and low risk for landslide susceptibility (0-1.5%).

HISTORICAL OCCURRENCES

The New York State Hazard Mitigation Plan indicates no previous landslide events or reported damages due to landslides in the Chemung County Planning Area. However, team input and previous mitigation planning cycles for the county indicate one documented landslide in the Town of Veteran (Table O-18). While no dollar damage amount has been assigned to the event, erosion to the impacted parcel has been reported as a result of the landslide. No damages to structures or infrastructure was reported.

Table O-18. Historical Landslide Events, 1960-2018¹²

JURISDICTION	NUMBER OF EVENTS	YEAR	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Town of Veteran	1	1994	0	0	\$0	\$0
Town of Veteran	1	1996	0	0	\$0	\$0
TOTAL LOSSES	2		0	0	\$0	

PROBABILITY OF FUTURE EVENTS

Based on available records of historic events, 2 known historic events in a 59-year reporting period for the Town of Veteran provides a probability of one event every ten years. This frequency supports an unlikely probability of future events for the Town of Veteran.

VULNERABILITY AND IMPACT

According to the New York State Hazard Mitigation Plan, the entire population in the Chemung County Planning Area is at a low risk of incidence. The only known landslides within the Town of Veteran is located in largely undeveloped residential areas and pose no threat to structures, infrastructure or populations. No critical facilities in the Town of Veteran is considered vulnerable to landslide.

The impact of landslides experienced in the Town of Veteran has resulted in no known structural damages and no injuries or fatalities, supporting a limited severity of impact meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10 percent of property is destroyed or with major damage.

¹² Damages are reported from January 1960 through June 2018.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms.	Cost	Staff time, materials and equipment
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Pantherlick is partially completed. Catherine Creek and Sleeper Run projects were completed. 3 floodplain houses were bought out on Catherine Creek. Action will be included in Plan Update.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the Stormwater Coalition for more effective municipal legislation regarding land use, zoning laws, Stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Updated the Comprehensive Plan. Updates to land use regulations are in progress and include many changes to improve stormwater management and flood risk reduction. Action will be included in Plan Update.
Flood-11b	Protect Infrastructure	Flood	Upgrade Dann Blvd to at least oil and stone and install proper drainage structures to prevent future flood damage and ensure Fire/Police/EMS direct route to residents during emergency response will not be blocked, causing lengthy detour.	Cost	Grant
				Level of Protection	10 Years
				Damages Avoided; Evidence of Success	Project complete.

NEW MITIGATION ACTIONS

Birch Hill Road Landslide		Town of Veteran – 1	
Risk/Vulnerability			
Hazard of Concern	Landslide		
Description of the Problem	An active landslide along Birch Hill Road results in substantial earth flows onto this road, blocking the road and presenting a safety hazard to motorists. In addition, earth flows from the landslide enters a tributary to Catharine Creek, a high-quality trout fishery.		
Action or Project Intended for Implementation			
Description of the Solution	The landslide would be mitigated through a combination of regarding (flattening the land slope), geotechnical approaches (including the use of geogrid), and drainage improvements.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	25 year	Estimated Benefits (losses avoided)	More reliable roadway system, safer conditions for motorists, and reduced silt and sediment to Catharine Creek
Useful Life	75 years		
Estimated Cost	\$750,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	With 5-year period
Estimated Time Required for Project Implementation	3 years	Potential Funding Sources	Grants, Local funding sources
Responsible Organization	Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$15,000/year	Continued safety & environmental issues
	Abandonment of Birch Hill Road	\$2,500	Problematic for residents and emergency vehicles
	Proposed Action	\$750,000	Reduce flooding, Protect residents
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

New Salt Storage Facility		Town of Veteran – 2	
Risk/Vulnerability			
Hazard of Concern	Winter Storm		
Description of the Problem	Existing salt storage facility is inadequate in design due to the age of the structure and current required capacity. Its reliability is questionable during large snow storm events. Also, salt-laden runoff from the site may be negatively impacting adjacent properties. The existing salt storage facility is inadequately designed for current requirements and usage, which compromises the ability of the Town to manage the road system properly during a snow storm. Also, salt-laden runoff is reaching adjacent properties, negatively impacting these.		
Action or Project Intended for Implementation			
Description of the Solution	The replacement of the existing salt storage facility (which is constructed of wood) with a new salt storage facility. The new salt storage facility would be included concrete foundation walls and a steel-framed, fabric-covered building superstructure.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	500 year	Estimated Benefits (losses avoided)	Benefits include reduced pollutants to off-site areas and improved reliability for proper winter maintenance of public thoroughfares.
Useful Life	40 years		
Estimated Cost	\$400,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	With 5 years
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, Local Sources
Responsible Organization	Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Upgrade/retrofit existing Salt Storage Facility	>\$500,000	Condition of exg. Building is beyond repair
	Installation of wood structure salt storage facility	>\$500,000	More expensive than steel-frame fabric-covered building
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Panther Lick Stream Stabilization Project		Town of Veteran – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Excess sediment directed to Catharine Creek tributary, resulting in downstream channel capacity issues and sediment introduced to Catharine Creek, a high-quality trout fishery. The existing Panther Lick near Dunn Road is unstable, resulting in excessive streambank erosion and erosion. This erosion and sedimentation results in sedimentation of downstream stream reaches, reducing channel capacity and negatively impacting trout habitat and spawning grounds.		
Action or Project Intended for Implementation			
Description of the Solution	Dimensional rock rip rap shall be strategically placed within and along Panther Lick to stabilize the streambanks and stream bed. In addition, plantings shall be integrated with the rock work.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	Medium	Estimated Benefits (losses avoided)	Reduced sediment load; improved trout habitat (including spawning grounds); Increased hydraulic capacity of downstream stream channel
Useful Life	50 years		
Estimated Cost	\$260,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grant and in-kind/local sources
Responsible Organization	Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Unacceptable erosion & sedimentation
	Replacement of Stream Channel with a large box culvert	>\$1,000,000	Elimination of stream would not be permissible with NYSDEC
	Proposed Action	\$260,000	Reduce flooding
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Terry Hill Road Bridge Replacement		Town of Veteran – 4	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The existing Terry Hill Road Bridge is old and is in poor structural condition. This poor structural condition jeopardizes motorist safety and roadway system reliability. The existing Terry Hill Road Bridge is old and is in poor structural condition. This poor structural condition jeopardizes motorist safety and roadway system reliability.		
Action or Project Intended for Implementation			
Description of the Solution	The existing bridge structure would be demolished and replaced with a new concrete box culvert.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	100-Year	Estimated Benefits (losses avoided)	2-lane bridge (in lieu of a signal lane), improved safety for motorists, improved reliability of roadway system
Useful Life	50 Years		
Estimated Cost	\$500,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	3-year period	Potential Funding Sources	Grants and Local Funding Sources
Responsible Organization	Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Unacceptable risks for motorists
	Elimination of bridge	\$10,000	Unacceptable inconvenience for residents & Delays for emergency vehicles
	Proposed Action	\$500,000	Protect lives; Reduce potential damages
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Town of Veteran – 5	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Floodplain Management		Town of Veteran – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Flood Study and Mapping		Town of Veteran – 7	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Town of Veteran Flood Insurance Rate Maps were developed from a limited flood study and currently have no base flood elevations. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Town of Veteran	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	TOWN OF VETERAN
Capital Improvements Plan	
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	x
Economic Development Plan	
Emergency Operations Plan	x
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	
Real Estate Disclosure Requirements	
Site Plan Review Requirements	
Stormwater Ordinance	
Subdivision Regulations	
Watershed Ordinance	

COMMUNITY CAPABILITY CHECKLIST	TOWN OF VETERAN
Zoning Ordinance/Land Use Restrictions	
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	
Public Education/Awareness Programs	x
Stream Maintenance Program	x
Storm Drainage Systems Maintenance Program	x
Storm Ready Community	x
Building Code Official	x
Emergency Manager	x
Engineer/Public Works Official	x
Environmental Conservation Specialist	x
Floodplain Administrator	x
GIS Specialist	x
Personnel with Hazard Knowledge	x
Planner	x
Public Information Official	x
Resource Development/Grant Writer	

ANNEX P: VILLAGE OF WELLSBURG

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JURISDICTION PROFILE

OVERVIEW

The Village of Wellsburg is located in Chemung County, New York, with a population just under 600. Wellsburg is located in the southeast part of the Town of Ashland. It is southeast of the City of Elmira and is part of the Elmira Metropolitan Statistical Area. Wellsburg is on the south bank of the Chemung River, a tributary of the Susquehanna River, and is adjacent to the Pennsylvania border. Bentley Creek flows northward through the village to the Chemung River and was a power source to early pioneers. According to the United States Census Bureau, the village has a total area of 0.58 square miles, of which 0.008 square miles, or 1.52%, is water. Figure P-1 shows the general location of the Village of Wellsburg.

VILLAGE OF WELLSBURG CONTACT INFORMATION

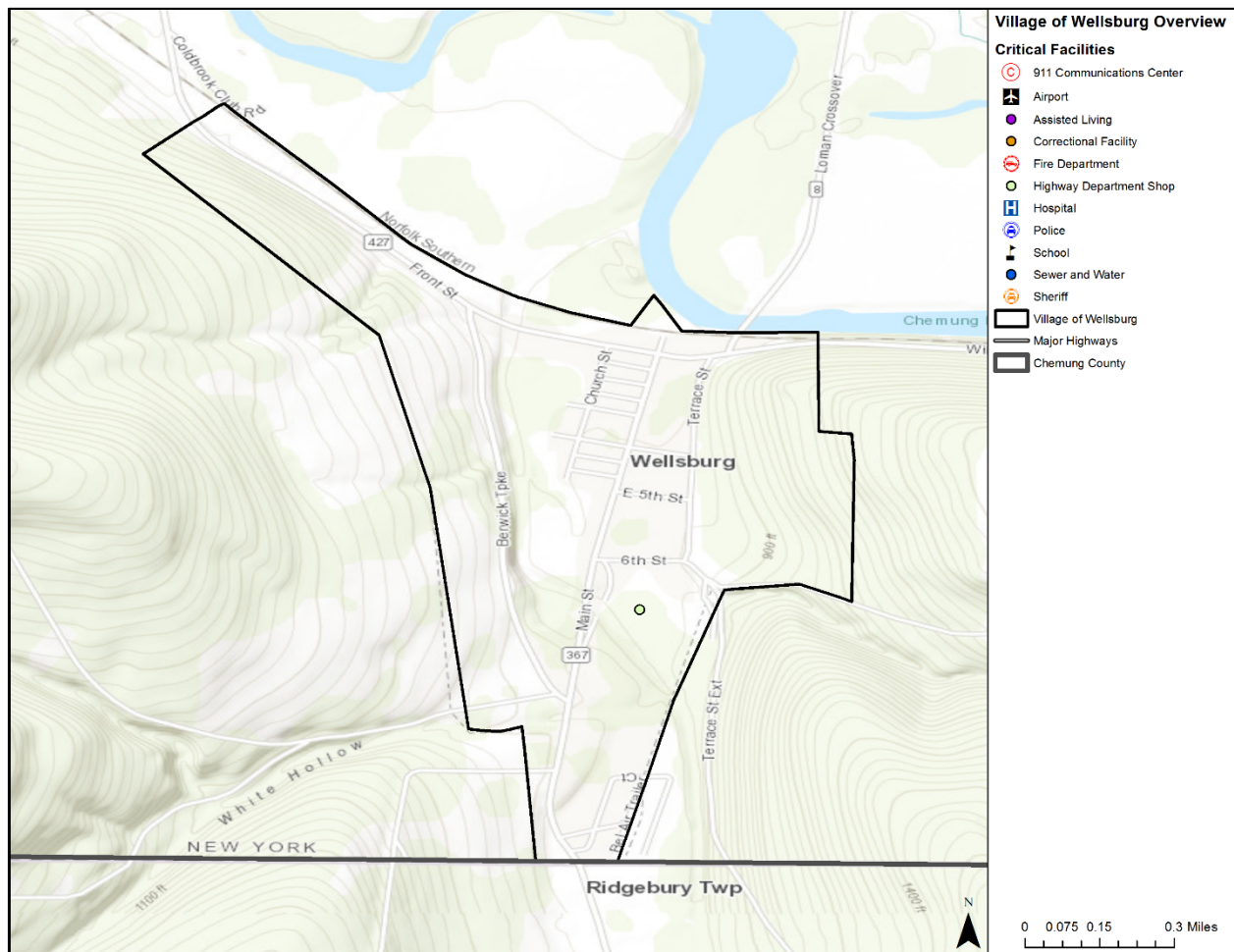
Name: Debra Lewis

Title: Mayor/Supervisor

Phone: (607)271-9129

Address: 3663 6th Street, Wellsburg, NY 14894

Email: njcraig@villageofwellsburg.com

Figure P-1. Village of Wellsburg Planning Area

POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, The Village of Wellsburg had a population of 580 residents. Table P-1 provides the population distribution within the Village of Wellsburg.¹

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in a given area at a given time.

¹ Source: <https://www.census.gov/quickfacts/table/PST045215/48469,00>

Table P-1. Population Distribution for the Village of Wellsburg

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE ²	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Elderly (Over 65)	Below Poverty Level
Village of Wellsburg	580	N/A	77	170

POPULATION GROWTH

The official 2010 Village of Wellsburg population is 580. While the change in population was not available for the Village of Wellsburg, it is assumed to be similar to the Town of Ashland which experienced a decrease in population between 1980 and 2010 by 13.8%. Table P-2 provides historic change rates in the Village of Wellsburg, where available.

Table P-2. Population for the Village of Wellsburg, 1980-2010

JURISDICTION	1980 ³	1990 ⁴	2000 ⁵	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
Village of Wellsburg	N/A	N/A	631	580	N/A	N/A	N/A	N/A

FUTURE DEVELOPMENT

To better understand how future growth and development in the Village of Wellsburg might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change, the number of permits that have been issued throughout the county, and economic impacts.

Population projections from 2010 to 2040 are listed in Table P-3, as provided Cornell University's Program on Applied Demographics⁶. **This information is only available at the County level;** however, the population projection shows a decrease in population density for the County, which would mean overall decline for the planning area.

² Percentages are based on city and town populations only.

³ https://www2.census.gov/prod2/decennial/documents/1980/1980censusofpopu80134unse_bw.pdf

⁴ <https://www2.census.gov/library/publications/decennial/1990/cp-1/cp-1-34-2.pdf?#>

⁵ <https://www.census.gov/prod/cen2000/dp1/2kh36.pdf>

⁶ <https://pad.human.cornell.edu/profiles/Chemung.pdf>

Table P-3. Chemung County Population Projections

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Chemung	411	88,830	216.13	85,524	208.09	81,715	198.82	76,946	187.22

HAZARD PROFILES

WINTER STORM

The Chemung County Hazard Mitigation Plan (Sections 5) provides a hazard description, location and extent of the winter storm hazard for each participating jurisdiction. Winter storm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area. Historical winter storm data for the county, including the Village of Wellsburg, are provided on a County-wide basis per the NCEI database. Therefore, all historical events are listed in Section 5 of the Plan.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Village of Wellsburg experiences approximately three winter storm events per year. Hence, the probability of a future winter storm event affecting the Village of Wellsburg is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

All populations, buildings, critical facilities, and infrastructure in the Village of Wellsburg are vulnerable to severe winter events. The following critical facilities would be vulnerable to Winter Storm events in the Village of Wellsburg:

Table P-4. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Village of Wellsburg	1 Highway Department Shop

Population over 65 in the Village of Wellsburg is estimated at 11.8% of the total population or an estimated total of 65⁷ potentially vulnerable residents in the planning area based on age (Table P-5).

⁷ US Census Bureau 2016 data for the Village of Wellsburg.

Table P-5. Population at Greater Risk

JURISDICTION	POPULATION 65 AND OLDER
Village of Wellsburg	65

Historic losses are reported on a county-wide basis. Please see Section 5 of this Plan for additional information on historical and annualized losses for the entire planning area.

THUNDERSTORM (THUNDERSTORM WIND, HAIL, & LIGHTNING)

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 6) provides a hazard description, location and extent of the thunderstorm hazard, including thunderstorm wind, hail, and lightning, for each participating jurisdiction. Thunderstorm events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

HISTORICAL OCCURRENCES

THUNDERSTORM WIND

Table P-6 depicts historical occurrences of thunderstorm wind events for the Village of Wellsburg according to the National Centers for Environmental Information (NCEI) data. From January 1955 to June 2018, 2 thunderstorm wind events are known to have impacted the Village of Wellsburg, based upon NCEI records.

Table P-6. Historical Thunderstorm Wind Events, 1955-2018⁸⁹

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Wellsburg	5/26/2011	7:25 PM	50	0	0	\$16,701	\$0
Village of Wellsburg	5/26/2011	7:25 PM	50	0	0	\$16,701	\$0
Village of Wellsburg Totals				0	0	\$33,402	

Based on the list of historical thunderstorm wind events for the Village of Wellsburg, none of the reported events have occurred since the 2012 Plan.

HAIL

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of hail events for the Village of Wellsburg. Historical hail events are often provided on a county-wide basis in the NCEI database. Hail events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

⁸ Damages are reported from January 1955 through June 2018.

⁹ Magnitude is listed when available. Damage values are in 2018 dollars.

LIGHTNING

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of lightning events for the Village of Wellsburg. Historical lightning events have only recently been reported as independent events to the NCEI and remain widely underreported. Lightning events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area

PROBABILITY OF FUTURE EVENTS

Historical thunderstorm events (including thunderstorm wind, hail and lightning) are reported on a county-wide basis. While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Village of Wellsburg can expect to experience a thunderstorm event every year. Hence, the probability of a future thunderstorm event affecting the Village of Wellsburg is highly likely.

VULNERABILITY AND IMPACT

The US Census data indicates a total of 58 manufactured homes (approximately 23.3%) located in the Village of Wellsburg (Table P-7). In addition, 83.9% (approximately 209 structures) of the residential structures in the Village of Wellsburg were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant thunderstorm events.

Table P-7. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Village of Wellsburg	58	209

The following critical facilities (Table P-8) would be vulnerable to thunderstorm events in the Village of Wellsburg:

Table P-8. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Village of Wellsburg	1 Highway Department Shop

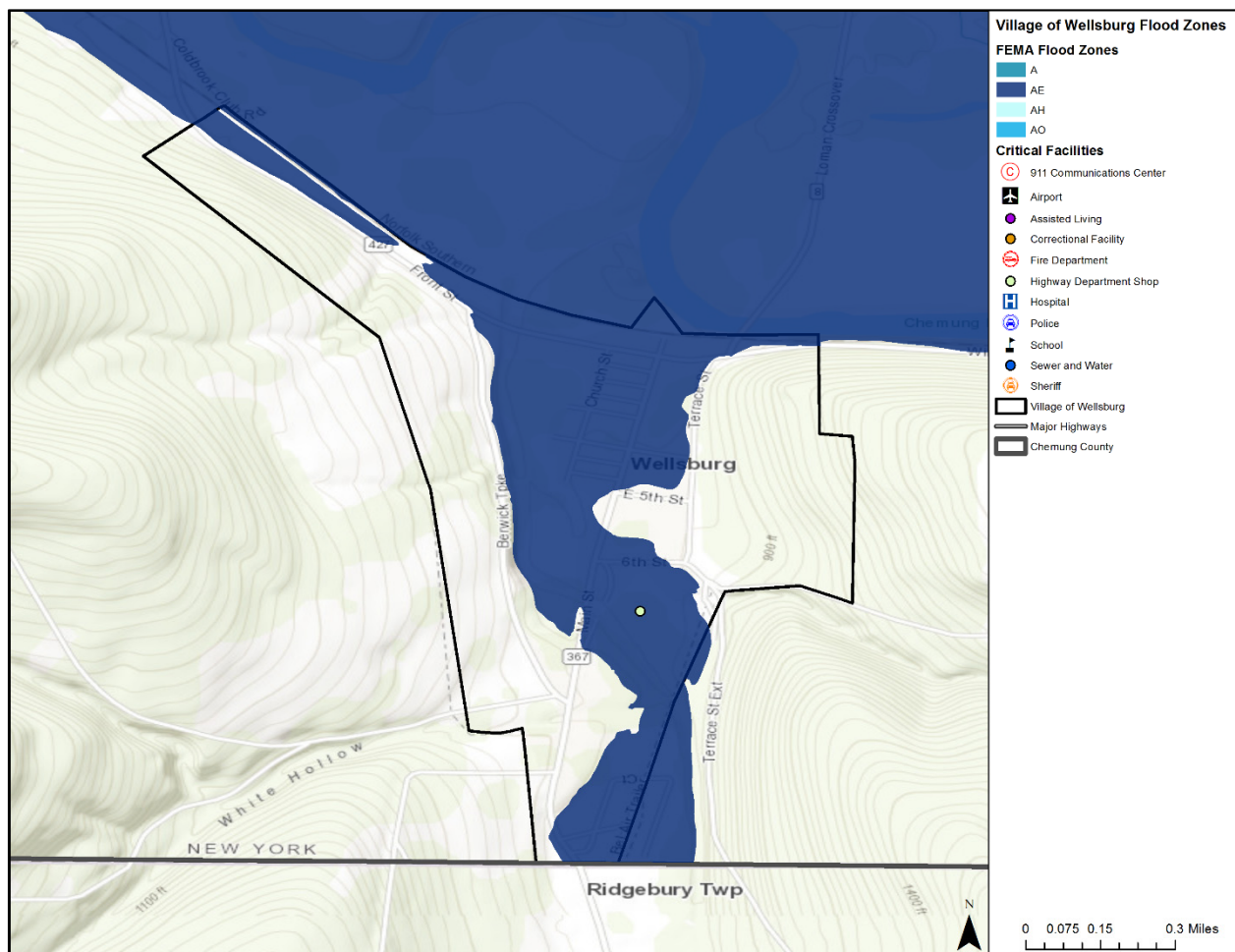
Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Village of Wellsburg has resulted in no injuries or fatalities. Impact of thunderstorms (including thunderstorm wind, hail and lightning) experienced in the Village of Wellsburg would be "Limited," with minor quality of life lost, injuries treatable with first aid, less than 10 percent of properties damaged and critical facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2018 dollars) is \$33,402 having an approximate annual loss estimate of \$522 (Table P-9).

Table P-9. Potential Annualized Losses for the Village of Wellsburg

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Wellsburg	\$33,402	\$522

FLOOD**HAZARD DESCRIPTION, LOCATION AND EXTENT**

The Chemung County Hazard Mitigation Plan (Sections 7) provides a hazard description and extent of the flood hazard, for the entire Planning Area. Full flood zone delineations with elevations are available in the Village of Wellsburg. The location of estimated flood zones for the Village of Wellsburg, based on the available Flood Insurance Rate Maps (FIRM) from FEMA is illustrated in Figure P-2.

Figure P-2. Estimated Flood Zones in the Village of Wellsburg

HISTORICAL OCCURRENCES

Table P-10 depicts historical occurrences of flood events for the Village of Wellsburg according to the National Centers for Environmental Information (NCEI) data. From January 1996 to June 2018, 1 flood event is known to have impacted the Village of Wellsburg, based upon NCEI records. Flood events are often reported on a county-wide basis, or under-reported for individual municipalities, particularly in small communities such as the Village of Wellsburg.

Table P-10. Historical Flood Events, 1996-2018¹⁰

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Village of Wellsburg	5/31/2006	0	0	\$0	\$0
Village of Wellsburg Totals		0	0	\$0	

Based on the list of historical flood events for the Village of Wellsburg, no reported event has occurred since the 2012 Plan.

PROBABILITY OF FUTURE EVENTS

While some incidents may be reported at the local municipal level, as indicated above, county level events provide a more robust risk assessment for each participating jurisdiction. According to historical records for the Chemung County Planning Area, the Village of Wellsburg can expect to experience a flood event every year. Hence, the probability of a future flood event affecting the Village of Wellsburg is highly likely.

VULNERABILITY AND IMPACT

Table P-11 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table P-11. Critical Facilities in the Floodplain

JURISDICTION	CRITICAL FACILITIES
Village of Wellsburg	1 Highway Department Shop

Historic loss estimates due to flood are presented in Table P-12 below.

¹⁰ Values are in 2018 dollars. Events reported from January 1996 through June 2018.

Table P-12. Potential Annualized Losses, 1996-2018¹¹

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Wellsburg	0	0	0	\$0	\$0

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each jurisdiction. Table P-13 depicts the level of impact for the Village of Wellsburg.

Table P-13 Village of Wellsburg Impact

JURISDICTION	IMPACT	DESCRIPTION
Village of Wellsburg	Limited	The Village of Wellsburg could have limited property damage with critical facilities typically shut down for 24 hours or less, and less than 10 percent of property would be destroyed or damaged.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

The Village of Wellsburg currently participates in the National Flood Insurance Program as well as the Community Rating System and has in place a flood damage prevention ordinance that includes standards above the minimum FEMA requirement.

NFIP COMPLIANCE AND MAINTENANCE

The Village of Wellsburg has developed mitigation actions that relate to NFIP participation, maintenance or compliance. Compliance and maintenance actions can be found in Section 12. Flooding was identified by the Village of Wellsburg as a moderate risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. The Village of Wellsburg has a designated floodplain administrator. The Village of Wellsburg floodplain administrator will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the Village of Wellsburg outlines the minimum requirements for development in special flood hazard areas. Table P-14 provides the most recent CAC/CAV dates along with the current status for the jurisdiction.

Table P-14. Compliance History

JURISDICTION	DATE OF LAST CAC	DATE OF LAST CAV	CURRENT NFIP STATUS	POLICIES IN FORCE
Village of Wellsburg	11/07/2011	08/08/2013	Good Standing	41

¹¹ Events reported from January 1996 through June 2018.

REPETITIVE LOSS

Table P-15 shows repetitive loss and severe repetitive loss properties for the Village of Wellsburg.

Table P-15. Repetitive Loss and Severe Repetitive Loss Properties

JURISDICTION	BUILDING TYPE	NUMBER OF STRUCTURES	NUMBER OF LOSSES
Village of Wellsburg	Single Family	1	2

TORNADO

HAZARD DESCRIPTION, LOCATION & EXTENT

The Chemung County Hazard Mitigation Plan (Sections 8) provides a hazard description, location and extent of the tornado hazard for all participating jurisdictions. Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information (NCEI) data, there have been no reported historical occurrences of tornado events for the Village of Wellsburg. Historical tornado events are often provided on a county-wide basis in the NCEI database, particularly when multiple smaller communities, such as the Village of Wellsburg, are impacted. Tornado events are not confined to specific geographic boundaries and is considered similar for all participating jurisdictions throughout the planning area.

PROBABILITY OF FUTURE EVENTS

Historical tornado events are often reported on a county-wide basis, particularly when multiple smaller jurisdictions are impacted. While some incidents may be reported at the local municipal level, county level events provide a more robust risk assessment for each participating jurisdiction due to their similar geographic locations. According to historical records for the Chemung County Planning Area, the Village of Wellsburg can expect to experience a tornado event once every three years. Hence, the probability of a future tornado event affecting the Village of Wellsburg is likely.

VULNERABILITY AND IMPACT

The U.S. Census data indicates a total of 58 manufactured homes (Table P-16) located in the Village of Wellsburg (23.3% of housing units). In addition, 83.9% (approximately 209 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table P-16. Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Village of Wellsburg	58	209

The following critical facilities would be vulnerable to tornado events in the Village of Wellsburg:

Table P-17. Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Village of Wellsburg	1 Highway Department Shop

The average loss estimate of property and crop is \$0 (in 2018 dollars), having an approximate annual loss estimate of \$0 (Table P-18). Based on historic loss and damages, the impact of tornado on the Village of Wellsburg can be considered “Limited,” with less than 10 percent of property expected to be destroyed.

Table P-18. Potential Annualized Losses, 1983-2018¹²

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Village of Wellsburg	\$0	\$0

LANDSLIDE

The Village of Wellsburg has no known areas susceptible or prone to landslide (Section 9). The Village of Wellsburg has no known historical occurrences of landslide and does not anticipate any landslide events in the future. The municipality determined that this hazard is not a threat to the village and therefore does not require further analysis.

¹² Events recorded from January 1983 through June 2018.

PREVIOUS MITIGATION ACTIONS

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood - 1	Improve Drainage System	Flood	Continue mitigation efforts in area streams. Projects include streambank stabilization, detention basin creation, gravel/debris removal after TS Lee and April storms. 1. Removal of gravel in Bentley Creek deposited by 2011 storms. If PL-566 is approved, will incorporate debris removal and maintenance. But must remove gravel now before next high water, estimated cost, \$500K- \$1 Mill 2. Ashland Town line to first bridge on Maple Ave. 3. Maple Ave bridge to Chemung River.	Cost	\$300,000
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Project 1 is complete. Project 2 and 3 were deemed to be unnecessary. Action will be deleted.
Flood-4	Property Buyouts	Flood	Secure Mitigation Grant funding to buy out properties in Floodplains damaged during Lee and April Storms. Homes pose repetitive loss problems. Will also consider elevating or modifying properties when cost efficient.	Cost	Home owner funding
				Level of Protection	100-year storm
				Damages Avoided; Evidence of Success	1 house elevated. Funding not pursued for additional buyouts. Action will be deleted.
Flood-9	Floodplain Management	Flood	Provide technical assistance through the stormwater Coalition for more effective municipal legislation regarding land use, zoning laws, stormwater management, etc.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Action will be included in the Plan Update.
Flood -10	Relocate Fire Department Building	Flood	Complete various construction and maintenance projects and create a schedule for ongoing maintenance of completed projects. 1. Robinson Rd- install larger capacity box culvert, remove current smaller metal pipe 2. Install rip-rap in several areas to armor banks, both Tyler Run and Bentley Creek.	Cost	Staff time, materials and equipment
				Level of Protection	10-year storm
				Damages Avoided; Evidence of Success	Project 1 is complete. Project 2- Bentley Creek is complete, Tyler Run is not. Action will be included in Plan Update.

ANNEX P: VILLAGE OF WELLSBURG

Project #	Project Name	Hazard Addressed	Summary of the Original Problem and the Solution (Project)	Evaluation of Success	
Flood -12	Relocate Fire Department Building	Flood	Assist the Wellsburg Volunteer Fire Department in finding a new location. Town and Village working cooperatively to secure grant funding and purchase land. Have land identified and plan for fill to ensure facility has 2 ft. freeboard.	Cost	\$2.5 Million
				Level of Protection	100-year storm
				Damages Avoided; Evidence of Success	Project complete.
Flood -14	Educate Property Owners	Flood	Promote the use of flood proofing techniques for retrofitting existing flood-prone development by distributing educational materials. Code Enf/Fldpln Admins have taken a continuing education course, and have educational packets created by Chemung County and STC with Mitigation Grant funds. Flood proofing info packets were distributed to residents after TS Lee, and presentation made at Village mtg. for residents.	Cost	Staff time
				Level of Protection	NA
				Damages Avoided; Evidence of Success	Materials have been made available on the County website and brochures are provided for annual mailings to residence. Project is county wide. Action will be included in Plan Update.

NEW MITIGATION ACTIONS

Emergency Generator for Fire Station		Village of Wellsburg – 1	
Risk/Vulnerability			
Hazard of Concern	Flood, Thunderstorm, Winter Storm, Tornado		
Description of the Problem	During flooding, thunderstorm wind events (including hail and lightning), severe winter storms and tornados, the Fire Station serves as the Emergency Operations Center as well. Power outages are likely and render the facility useless. There are no lights, computers, heat, communications- all rely on electricity.		
Action or Project Intended for Implementation			
Description of the Solution	Install emergency generator with hardwired quick connections.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	High	Estimated Benefits (losses avoided)	The Fire Station and Emergency Operations Center will remain operational during power outages.
Useful Life	50 yrs.		
Estimated Cost	\$200,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 3 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding, local funding source
Responsible Organization	Village of Wellsburg	Local Planning Mechanisms to be Used in Implementation, if any	Village improvements schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Make building generator ready	\$100,000.00	Would still be without power until a generator from State is requested through Emergency Management.
	Try to find another facility with power to use as EOC	Dependent on facility being used	Would have to move all operations to another location. Impractical to move Fire Dept. ops out of Village.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX P: VILLAGE OF WELLSBURG

Tyler Run (Creek) Relocation / Realignment		Village of Wellsburg – 2	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	During larger storm events, Tyler Run inundates both Church and Front Streets within the Village of Wellsburg, resulting in the flooding of businesses and residences.		
Action or Project Intended for Implementation			
Description of the Solution	Work with Chemung County Soil and Water to realign Tyler Run in a direct route to Bentley Creek and away from Village residences and businesses.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	100-year storm	Estimated Benefits (losses avoided)	This project would significantly reduce the flooding experienced in the Village, especially for the homes and businesses on Front and Church Streets.
Useful Life	50 yrs.		
Estimated Cost	\$400,000.00		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding
Responsible Organization	Village of Wellsburg	Local Planning Mechanisms to be Used in Implementation, if any	Soil and Water District work schedule
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Improvements to increase capacity of existing channel and culverts	\$650,000	Work would involve replacement of existing culverts and work on private property.
	Installation of flood control reservoir in the Tyler Run watershed	\$1,000,000	Work would involve construction of reservoir on private property. Reservoir would be a high hazard dam.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX P: VILLAGE OF WELLSBURG

Automated Rain Gauge and Stream Gauge for Bentley Creek		Village of Wellsburg – 3	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	Bentley Creek flows through the Village from the south. Often the upstream region gets significantly heavy rain events that are not as heavy for the Village of Wellsburg, resulting in unexpected flash flooding for the Village of Wellsburg.		
Action or Project Intended for Implementation			
Description of the Solution	Install a precipitation and stream gauge upstream of Wellsburg to alert the Village when heavy rain or sharp stream rises are occurring to the south. The Village could have some advanced warning of possible flash flooding and could better respond to these events. These gauges could be networked into a regional gauge system for better situational awareness for other agencies as well.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	Up to 100-year storm	Estimated Benefits (losses avoided)	Would allow for advanced warning of rises in the Bentley Creek due to heavy rain events upstream. Allows Village to better warn and prepare residents for possible flash flooding..
Useful Life	30 years		
Estimated Cost	\$30,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	5 years
Estimated Time Required for Project Implementation	1 year	Potential Funding Sources	Grant funding, possible assistance from Environmental Emergency Services (EES)
Responsible Organization	Village of Wellsburg	Local Planning Mechanisms to be Used in Implementation, if any	Village work plan and EES work plan
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	
	Installation of a staff gauge in Creek and recruiting/training of select residents to be rain gauge readers/reporters	\$5000.00	Would need to rely on residents to install gauges correctly, and correctly read/report rain and stream gauge levels, in a timely manner if we are to warn residents
	Pursue the PL-566 proposal for a flood control levee on Bentley Creek	Several Million Dollars	Village has not been able to support this proposal historically due to lack of funding. Need financial assistance.
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Public Education and Outreach		Village of Wellsburg – 4	
Risk/Vulnerability			
Hazard of Concern	Flood, Landslide, Winter Storm, Tornado, Thunderstorm		
Description of the Problem	General public may not have a full understanding of the risk associated with hazards impacting the planning area. Education programs can provide life safety benefits to residents in the area and provide information on mitigation measures residents can employ to reduce damages to their property.		
Action or Project Intended for Implementation			
Description of the Solution	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Implement Flood / Emergency Evacuation Routes (Haz Mat, RR included). Need refinements based on new dam and river inundation maps.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Education programs for residents are a proven method for reducing injuries, fatalities and property damage.
Useful Life	NA		
Estimated Cost	\$5,000		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	12 months	Potential Funding Sources	Grant funding, local funding sources
Responsible Organization	Village of Wellsburg Administration	Local Planning Mechanisms to be Used in Implementation, if any	NA
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Insurance premiums remain high; policies in-force may drop
	Education/outreach program on availability of flood insurance	\$5,000	Cost effective but provides no financial relief to residents
	Proposed project	\$5,000	Considered cost effective; Reduction in insurance premiums
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

Floodplain Management		Village of Wellsburg – 5	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	STC helps to guide the municipalities within Chemung County in making decisions that will protect and maintain water resources.		
Action or Project Intended for Implementation			
Description of the Solution	Provide technical assistance through STC for more effective municipals legislation regarding land use, zoning laws, stormwater management, etc.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	NA	Estimated Benefits (losses avoided)	Providing technical assistance through STC would provide expertise and support for regional watershed.
Useful Life	NA		
Estimated Cost	Staff time		
Plan for Implementation			
Prioritization	High	Desired Timeframe for Implementation	Within 1 year
Estimated Time Required for Project Implementation	3 months	Potential Funding Sources	Local funding sources
Responsible Organization	Chemung County Soil & Water Conservation District in coordination with the Village of Wellsburg	Local Planning Mechanisms to be Used in Implementation, if any	Improvement schedules of impacted municipalities & entities
Three Alternatives considered (including No Action)			
Alternatives	N/A – Regional coordination and technical assistance		
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

ANNEX P: VILLAGE OF WELLSBURG

Flood Study and Mapping		Village of Wellsburg – 6	
Risk/Vulnerability			
Hazard of Concern	Flood		
Description of the Problem	The Village of Wellsburg Flood Insurance Rate Maps are dated and do not reflect the full flood risk for the community. Updated mapping is needed for future development to build a more resilient community and reduce potential damages.		
Action or Project Intended for Implementation			
Description of the Solution	Undertake a comprehensive study of flood risk and reduction alternatives. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study.		
Is this Project related to a Critical Facility?		Yes	No X
Level of Protection	N/A	Estimated Benefits (losses avoided)	Improve risk assessment; reduce risk of future damages or injuries through improved building standards.
Useful Life	N/A		
Estimated Cost	\$1,000,000		
Plan for Implementation			
Prioritization	Medium	Desired Timeframe for Implementation	Within 5-year period
Estimated Time Required for Project Implementation	2 years	Potential Funding Sources	Grants, In-kind/local sources, USACE
Responsible Organization	Village of Wellsburg	Local Planning Mechanisms to be Used in Implementation, if any	Local Flood Damage Prevention Ordinance
Three Alternatives considered (including No Action)			
Alternatives	Action	Estimated Cost	Evaluation
	No Action	\$0	Less stringent building requirements may lead to future flood damages for new development.
	Adopt ordinance requiring elevation of all new development	>\$1,000,000 (construction costs)	Not considered cost effective; May not entirely prevent flooding in high risk areas; Undue burden to developers in low risk areas
	Proposed Action	\$1,000,000	Cost effective, feasible alternative
Progress Report (for plan maintenance)			
Date of Status Report			
Report of Progress			
Update Evaluation of the Problem and/or Solution			

CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	VILLAGE OF WELLSBURG
Capital Improvements Plan	
Master or Comprehensive Plan	
Community Wildfire Protection Plan	
Continuity of Operations	
Economic Development Plan	
Emergency Operations Plan	
Evacuation Plan	x
Flood Response Plan	
Floodplain Management Plan	
Hazard Mitigation Plan	x
Historic Preservation Plan	
Land Use Plan	
Open Space Plan	
Post-disaster Recovery Plan	
Redevelopment Plan	
Stormwater Management Plan	x
Transportation Plan	
Watershed Protection Plan	
Building Codes	x
Floodplain Ordinance	x
Property Set-Back Ordinance	
Real Estate Disclosure Requirements	
Site Plan Review Requirements	
Stormwater Ordinance	
Subdivision Regulations	
Watershed Ordinance	

ANNEX P: VILLAGE OF WELLSBURG

COMMUNITY CAPABILITY CHECKLIST	VILLAGE OF WELLSBURG
Zoning Ordinance/Land Use Restrictions	
Fire Code	x
Floodplain Maps/Flood Insurance Studies	x
Hydrologic/Hydraulic Studies	
Mutual Aid Agreement	x
National Flood Insurance Program Participant	x
NFIP Community Rating System Participant	
Property Acquisition Program	
Public Education/Awareness Programs	
Stream Maintenance Program	
Storm Drainage Systems Maintenance Program	
Storm Ready Community	x
Building Code Official	
Emergency Manager	x
Engineer/Public Works Official	
Environmental Conservation Specialist	
Floodplain Administrator	x
GIS Specialist	
Personnel with Hazard Knowledge	
Planner	
Public Information Official	
Resource Development/Grant Writer	