This hazard mitigation plan encompasses the Town of Elmira in Chemung County, New York. It excludes the portion of the Town of Elmira that is within the incorporated limits of the Village of Elmira Heights. Development of this plan was funded, in part, by a Pre-Disaster Mitigation program grant from the New York State Emergency Management Office and Federal Emergency Management Agency.
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SECTION 1 – EXECUTIVE SUMMARY

The Town of Elmira Hazard Mitigation Action Plan includes resources and information to assist public and private sectors in the Town of Elmira to reduce the losses from future hazard events. This plan is not a manual of what to do if a disaster occurs. Instead, it concentrates on actions that can be implemented prior to disaster events in order to reduce the damage to property and potential loss of life. The plan includes an assessment of the Town’s risks and vulnerabilities, a strategy for minimizing those risks (goals and objectives), and an action plan that will be implemented to achieve the objectives.

This plan is intended to fulfill the planning requirements for state and federal assistance programs. It will enable the Town of Elmira to apply for hazard mitigation grants that will assist with implementation of the proposed projects identified in this plan.

BACKGROUND

The Town of Elmira is a residential community located east, north, and west of the City of Elmira. Since sustaining significant flood damage in August 1994, the Town has been very proactive in mitigating flood hazards.

PLANNING PROCESS

The Town of Elmira Hazard Mitigation Action Plan was developed as part of an ongoing hazard mitigation planning process in the Town of Elmira and Chemung County. In 1995, the Town of Elmira Storm-Water Drainage Task Force prepared recommendations to the Town Board of steps that could be taken to mitigate the impact of flood damages. In 1999, a Chemung County Hazard Analysis Report was prepared based on the analysis of natural and man-made hazards by a group of local officials using the HAZNY (Hazards New York) computer program. In 1999, the Town completed and adopted a Flood Mitigation Action Plan, Town of Elmira. The flood mitigation plan was updated and revised in 2000. The present plan incorporates and expands on the information assembled during these and other previous planning efforts. This plan documents the Town of Elmira program for mitigating the risks from natural and man-made hazards.

A series of meetings were held to gather information and recommendations for this hazard mitigation plan. Participants in this planning process included representatives from the Elmira Town Board, Storm-Water Control Board, Town Highway Department, Town Building Department, Town Drainage Department, West Elmira Fire Department, West Elmira Police Department, Chemung County Emergency Management Office, NYS Department of Environmental Conservation, and concerned citizens. Staff support was provided by Flood Mitigation Specialist from Southern Tier Central Regional Planning and Development Board. In addition to the information and recommendations assembled at the planning meetings, numerous
agencies, organizations, and members of the public were contacted for additional input.

**RISK ASSESSMENT**

The recommendations in the *Town of Elmira Hazard Mitigation Plan* are based on an assessment of the Town’s vulnerability to each of 29 hazards. Each potential hazard was evaluated and ranked based on the scope (area of impact and potential for a cascade effect), frequency, impact, onset (warning time), and duration of a hazard event. This plan focuses on the seven hazards given a high priority or moderately high priority ranking. These hazards (in order of priority) are:

**High Priority Hazards:**
- Flood/flash flood
- Hazardous material released in transit

**Moderately High Priority Hazards:**
- Severe storm
- Ice storm
- Extreme temperatures
- Utility failure
- Severe winter storm

**MITIGATION STRATEGY**

The overall purpose of the *Town of Elmira Hazard Mitigation Action Plan* is to protect life and property from natural and human-caused hazards.

The proposed mitigation strategy is represented by the following long-range goals, which encompass the highest ranked hazards for the Town of Elmira. The *Town of Elmira Hazard Mitigation Action Plan* identifies specific objectives for achieving each goal.

**Multi-Hazard Mitigation Goals**

- Raise public awareness about hazards and how to respond.
- Provide emergency services in a timely and effective manner.
- Maintain the viability of all critical facilities and operations.
- Maintain political support for hazard mitigation and emergency response.
- Establish and maintain partnerships between public and private sectors.

**Flood/Flash Flood Goals**

- Raise public awareness about flood hazards, flood safety, and flood damage protection measures.
- Protect new development from flooding hazards.
- Protect new and existing development from streambank erosion.
• Ensure that runoff from new construction and land use changes does not contribute to increased flood risks.
• Maintain streams, drainage ways, and drainage structures to minimize the potential for obstruction of flow.
• Mitigate flood risks for existing development.
• Provide timely and reliable warning of floods and flash floods.

**Hazardous Material Goals**

• Provide the public with information about how to respond appropriately to a hazardous material incident.
• Ensure quick and effective response by emergency response personnel to a hazardous material release or explosion.
• Design and locate new development in such a manner as to minimize risks associated with the transport and use of hazardous materials.
• Utilize equipment, processes, and procedures that minimize the risk of explosion or exposure to hazardous substances at facilities that store and/or use hazardous materials.

**Transportation Safety Goals**

• Maintain and upgrade roads in a manner that promotes transportation safety.
• Promote transportation safety.
• Design and locate new development projects to promote transportation safety.
• Ensure quick and effective response by emergency response personnel to a major transportation accident.

**Severe Weather Goals**

• Maintain trees appropriately in areas where broken branches can severely impact infrastructure and other development.
• Bury utility cables so they are not susceptible to damage by wind and ice.
• Raise public awareness about severe weather conditions and how to respond.
• Require that buildings be designed to withstand high wind and heavy snow.
• Reopen transportation routes as quickly as possible following a severe weather event.

**Utility Failure Goals**

• Maintain essential services and emergency operations during a utility failure.
• Restore utility service as quickly as possible following an outage.
• Provide the public with information about what to do during an extended power outage.
Terrorism Goals

- Provide the public with information about potential terrorist threats and how to respond.
- Address terrorist threats in the operating policies of facilities that may be potential terrorist targets.
- Coordinate with county, state, federal, and international task forces and agencies that are preparing for or responding to terrorist threats.

Dam Failure Goals

- Conduct routine inspections and maintenance of manmade dams.
- Ensure that at risk areas are evacuated quickly when conditions exist for potential dam failure.

ACTION PLAN

The Town of Elmira Hazard Mitigation Action Plan recommends implementation of the following high priority actions.

Measures To Be Implemented through Existing Programs

Some of the mitigation objectives for the Town of Elmira are already being implemented. Others can be incorporated into existing municipal operations and ongoing local programs. The following recommended activities utilize existing or anticipated local resources to mitigate hazards.

Multi-Hazard Mitigation

- Distribute hazard information at Town Hall
- Include hazard information in Town newsletter articles
- Disseminate hazard information on the internet
- Support education efforts
- Encourage greater utilization of NOAA weather radios
- Review and update Emergency Plan
- Support Environmental Emergency Services, Inc.
- Provide Chemung County Communication Center with locations of single access roads
- Periodically review and revise Comprehensive Plan and land use regulations
- Provide hazard mitigation training for Planning Board members

Flood/Flash Flood

- Utilize direct mailing to owners of flood-prone property
- Expand network of volunteer rain gauge readers
- Maintain and utilize database of flooding and drainage information
• Inspect and maintain drainage ways
• Participate in joint maintenance program for Old Chemung Canal
• Identify funding sources for drainage and stormwater management programs
• Review potential for regional stormwater facilities
• Request updated Flood Insurance Rate Maps
• Encourage establishment and maintenance of vegetated riparian buffers
• Implement stream stabilization projects
• Organize a community sand bag program
• Request early notification of floodplain property foreclosure
• Obtain information about land swaps to acquire flood-prone property
• Assist property owners with floodproofing measures
• Upgrade existing drainage structures
• Improve Community Rating System classification
• Protect culvert entrances from blockage by debris

Hazardous Materials
• Implement radon testing and education program
• Provide hazardous material awareness training for Town Highway Department

Transportation Safety
• Maintain communication with the NYS Department of Transportation
• Provide municipal personnel with defensive driving training

Dam Failure
• Prepare Dam Safety Plan for the Larchmont Road Detention Facility
• Request Emergency Action Plan for Elmira Reformatory Dam

Proposed Projects for Which Additional Resources Are Needed

Additional funding is needed in order to fulfill the proposed hazard mitigation goals for the Town of Elmira. The high priority mitigation projects that the Town proposes to implement if funding can be secured include the following.

Multi-Hazard Mitigation
• Develop community emergency training program
• Provide emergency response training for municipal officials
• Install repeater for Town Highway Department radio communication
• Obtain generator for East Hill Highway Garage
• Provide NOAA weather radios to public facilities

Flood/Flash Flood
• Develop the public outreach and public involvement components of the Town’s stormwater management program
• Expand database of flooding and drainage information
• Develop and implement stormwater management program
• Control stormwater and peak discharges on East Hill
• Collect LIDAR topographic data

Hazardous Materials
• Provide financial assistance for radon mitigation
• Provide radon mitigation training

Groundwater Contamination
• Maintain Chemung County water testing program

PLAN MAINTENANCE

The Town of Elmira Hazard Mitigation Action Plan is an active document that will be periodically reviewed, updated, and revised. Municipal officials, emergency response personnel, agency staff, and the public will be involved in this ongoing planning process.
SECTION 2 – BACKGROUND

The Town of Elmira is a community of 7,199 residents (2000 census) located west, north, and east of the City of Elmira in Chemung County, NY. Part of the Village of Elmira Heights is located within the Town of Elmira (including 1,032 Village residents), but is not included in this plan. The population of the Town of Elmira has decreased 3.24% since the 1990 census (1990 census population 7,440). 23.4% of the Town residents are children (under 18 years old) and 19.8% are elderly (65 years old and over).

LAND USE AND ASSETS

The land area of the Town of Elmira is 22.3 square miles. It is primarily a residential community, with 3,183 housing units (2000 census). The distribution of land uses (based on property tax classifications) is shown on the Land Use map and table in Attachment A. Development is concentrated in the southwestern part of the Town, known as West Elmira, and in areas adjacent to the City of Elmira. West Elmira features some of Chemung County’s oldest homes and some to the area’s more upscale neighborhoods. Over the years, residential growth in West Elmira has expanded from the Chemung River Valley up the hillsides and onto West Hill. In the eastern part of the Town, East Hill remains sparsely developed, with steep wooded areas and scattered farms and residences. State Route 17 is located in the Chemung River Valley in the eastern part of the Town. This major east-west transportation corridor is being upgraded to Interstate Highway standards and will become Interstate-86.

The Town has an equalized assessed value of over $238 million, of which $181 million is in buildings and the remainder in land. The distribution of these assets over the various property classes is shown in the Town of Elmira Assets table in Attachment A. Approximately 86% of the assessed value within the Town is residential. The remainder (in order of total value) is community services, commercial, recreation/entertainment, industrial, vacant land, agriculture, public services, and forested.

Information from the property tax records about the age of residential construction is provided in the Age of Residential Structures table in Attachment A. About 51% of the Town’s residential structures were built before 1950, including 225 structures that were built before 1900.

CRITICAL FACILITIES

For the purposes of this plan, critical facilities are defined as follows:

A critical facility is any facility that is an integral part of emergency response operations or one that requires special emergency response due to the potential at the site for triggering an additional hazardous incident.
A table listing the Critical Facilities and Operations Serving the Town of Elmira is included in Attachment A. The locations of some of these facilities are shown on the maps of Critical Facilities and Transportation Infrastructure in Attachment A. Additional areas that are vulnerable to hazards are shown on the Vulnerable Sites map and the Flood Hazards and Problems map in Attachment A.

DEVELOPMENT TRENDS

The Town of Elmira has experienced a steady rate of residential development over the years, despite a declining population. Most recent construction has consisted of re-development in the densely populated areas of West Elmira and large-lot residential development in upland areas on West Hill. If the current trend of residential expansion into rural areas surrounding the City of Elmira continues, the Town of Elmira is likely to experience additional residential development. Since there are few remaining lots in the West Elmira area, future development is expected to occur on undeveloped parcels on West Hill and in the East Hill area of the Town. In addition, the proposed designation of State Route 17 as an interstate highway (I-86) is expected to stimulate development near the highway corridor in the eastern part of Elmira.

HAZARD MITIGATION EFFORTS

The Town of Elmira Hazard Mitigation Action Plan is part of an ongoing effort on behalf of the Town to be proactive in mitigating the consequences of natural hazards, particularly flooding. This plan expands on the Flood Mitigation Action Plan, Town of Elmira that was prepared in 1998-99 and updated in 2000.

National Flood Insurance Program

In 1984, the Town of Elmira joined the Regular Phase of the National Flood Insurance Program. Since that time, development within the areas designated as the 100-year floodplain (on the Town’s Flood Insurance Rate Maps) has been regulated by a local ordinance. These regulations specify that new development within the designated floodplain must comply with elevation requirements and construction standards that protect structures from the 100-year flood event. The floodplain development standards also protect neighboring properties from increased flood damage that might result from new development. The Code Enforcement Officer has received specialized training in implementation of these floodplain standards.

Flood insurance can be purchased for any building in the Town of Elmira. On February 28, 2003, there were 71 flood insurance policies in the Town (down from 88 on March 3, 1999). The value of the property covered by these policies is $8.2 million. Flood insurance claims since 1978 have totaled $29,369 (for 15 claims). This represents only a fraction of the total flood damages because many property owners do not carry flood insurance and many damages
(particularly to basements and basement contents) are not covered. No properties in the Town of Elmira are listed by the National Flood Insurance Program as “repetitive loss properties” (due to two or more flood insurance claims within any ten-year period).

In 1991, the Town of Elmira began participation in the Community Rating System of the National Flood Insurance Program. Participation in this program enables property owners to purchase flood insurance at reduced rates as a result of activities that reduce the flood risks within the Town. The Town presently qualifies for a 5% reduction in flood insurance premiums.

**Flood Mitigation**

In October of 1994, the Elmira Town Board formed a citizens’ committee, the Storm-Water Drainage Task Force, in response to flooding from Hurricane Beryl. After studying the flooding and drainage problems in the Town, the Task Force recommended to the Board that:

- a person be employed to create a storm-water program and
- money be appropriated to begin work aimed at solving the storm-water problem, with a focus on the flooding of homes.

The Town Board responded by hiring a Drainage Officer and allocating $40,000 to the Drainage Department for the remainder of the 1995 fiscal year. This allocation was increased to $117,000 in 1996 and has continued at various funding levels since that time.

During the autumn of 1995, the Storm-Water Drainage Task Force submitted a report and recommendations to the Town Board. As a result of these recommendations, the Board approved Resolution #185-95, quoted below:

**Resolution #185-95**

Approve Storm Water Recommendations

By Mr. Bush
Seconded by Mr. Lapple

Motion was made to approve the Storm-Water Drainage Task Force Findings and Recommendations Report #2 recommendations #1, 2 and 3 as modified.

Recommendation #1: It is recommended that the Town of Elmira take a leadership role in developing a program to stop erosion in all natural streams and drainage ways.

Recommendation #2: It is recommended that the Town Board seek and provide funding to complete these critical projects as soon as reasonably possible.

Recommendation #3: It is recommended that the erosion-control program be carried well beyond the critical areas cited in Section 7 [of the Task-Force report] to cover the entire town, as implied by Recommendation 1.

Aye- Lapple, Gerard, Bush, Yungstrom
No- None
Since 1995, the Town of Elmira has undertaken extensive efforts to resolve flooding, streambank erosion, and drainage problems. When repairs have been necessary, every effort has been made to address the problem rather than just repairing the damage. The Town has installed numerous drop structures in the streams of west Elmira in order to stabilize these steep, incising channels. Two debris basins have been installed to enable removal of sediment, trees, and other debris before they contribute to flooding problems in developed areas. Two regional detention ponds have been built to provide flood protection for existing development and control stormwater runoff from anticipated development. Pipe entrances have been protected from the accumulation of debris. Erosion sites have been rehabilitated with rock riprap. Mitigation measures have been incorporated into local land use regulations. These corrective and preventive measures are credited with reducing the extent and severity of damages from recent storm events.

The Town has also exhibited a commitment to preventing new drainage and flooding problems. It is recognized that the existing flooding and erosion problems in West Elmira exist because development occurred without sufficient consideration of the effects of increased runoff on the existing small streams. Revision of the Town of Elmira Zoning Ordinance has incorporated a number of flood mitigation provisions, including: stormwater management standards, erosion and sediment control standards, maximum impermeable surfaces, and a Conservation Zone in the parts of floodplain regulated as “floodway.” In 2000, the Town enacted an ordinance prohibiting littering and stream dumping. The Town of Elmira is in the process of developing a comprehensive stormwater management program and has obtained permit coverage for the Municipal Separate Stormwater Sewer System (MS4) within the Elmira urbanized area.

**Water Supply Protection**

The Elmira Water Board has conducted a Vulnerability Assessment on their systems and developed a Contingency Plan. Any identified deficiencies are being addressed.

**All-Hazard Mitigation and Response**

The Town of Elmira makes an annual financial contribution to Environmental Emergency Services, Inc. This is a two-county not-for-profit organization that operates the Chemung Basin Flood Warning Service and a Chemical Hazard Information Team. The Flood Warning Service operates a network of climate stations, precipitation gauges, and river gauges. The Chemical Hazard Information Team provides chemical and safety information and guidance to local emergency responders in the event of hazardous material incidents.

In January 2003, the Town of Elmira adopted the new New York Uniform Fire Prevention and Building Code, which increases the safety standards for new construction.

Local government is the lead decision-maker in times of emergency. The Town of Elmira has an *Emergency Management Plan*, which outlines the procedures and cites the authority to guide action in the event of a major emergency or disaster. The emergency response plan is reviewed and updated periodically.
SECTION 3 – PLANNING PROCESS

The *Town of Elmira Hazard Mitigation Action Plan* was developed as part of an ongoing hazard mitigation planning process in the Town of Elmira and Chemung County. In 1998, the Town established a Flood Mitigation Planning Committee (by resolution at the June 15, 1998 meeting) to prepare the *Flood Mitigation Action Plan, Town of Elmira*. The flood mitigation plan was finalized in July 1999 and adopted by the Town Board on December 30, 1999 (Resolution #190-99). This plan was updated in 2000 and the revised *Flood Mitigation Action Plan* adopted by the Town Board on November 28, 2000 (Resolution #173-00). In 2002 and 2003, additional meetings were held to update the flood mitigation information and expand the plan to incorporate other hazards. The resulting plan is now called the *Town of Elmira Hazard Mitigation Action Plan*.

The *Town of Elmira Hazard Mitigation Action Plan* documents the Town’s approach to mitigating the adverse impacts of natural and human-caused hazards. It is not a manual of what to do if a disaster occurs. Instead, it concentrates on actions that can be implemented prior to disaster events in order to reduce the damage to property and potential loss of life. The plan includes an assessment of the Town’s risks and vulnerabilities, the strategy for minimizing those risks (goals and objectives), and the action plan that will be implemented to achieve the objectives. The process of developing this plan enabled the Town to identify and implement policies, programs, and projects that will reduce the potential losses from future disasters. The *Town of Elmira Hazard Mitigation Action Plan* is an active document that will be periodically reviewed, updated, and revised.

PLANNING MEETINGS

The Elmira Town Board appointed a Flood Mitigation Planning Committee on June 15, 1998. That committee was comprised of 5 citizen members (including the Chairman of the Storm-Water Control Board), the Town Drainage Officer, the Town Highway Superintendent, the Town Code Enforcement Officer, and a Town Board Representative. Additional participation was solicited. Staff support for development of the *Flood Mitigation Action Plan, Town of Elmira* was provided by Flood Mitigation Specialist for Southern Tier Central Regional Planning and Development Board. The committee held the following meetings to gather information and recommendations for the flood mitigation plan:

- **6/10/98: Organizational meeting:** Introduction to the flood mitigation planning process. Identify planning committee members. Develop a strategy for coordinating with other agencies. Develop a strategy for involving the public. Identify individuals (agency staff and members of the public) who will be asked to participate. Define the scope of the planning process.

- **7/8/98: Assess hazards and problems:** Update on committee membership. Update on outreach activities. Assemble and review flood damage information collected following the

- **8/12/98: Assess hazards and problems:** Review and revise hazard and problem information compiled from previous meeting. Compile additional flood hazard and problem information. Mark problem areas on a map.

- **8/20/98: Assess hazards and problems:** Compile additional hazard and problem information for riverine flooding, streambank erosion, localized drainage problems, shallow water table, potential impacts of new development, and flood warning capabilities.

- **9/10/98: Set flood damage reduction goals:** Review other community goals. Discuss the committee’s vision of how flooding issues can be addressed and future flood damages prevented. Compile a list of flood damage reduction goals for the Town of Elmira.

- **10/22/98: Flood Solutions Workshop:** At a joint meeting with other Flood Mitigation Planning Committees and County and State agency personnel, review and discuss possible solutions to flooding and drainage problems. Complete a flood solutions worksheet to indicate the solutions applicable to flooding problems in the Town of Elmira. The agencies represented at this workshop included the County Emergency Management Office, County Soil and Water Conservation District, County Planning Department, County Environmental Management Council, County Legislature, Regional Planning Board, State Department of Environmental Conservation, and State Emergency Management Office.


- **12/10/98: Prepare an action plan:** Review Flood Solutions Worksheet. Review a map of land uses in relation to flood-prone areas. Using the flood mitigation goals and the flood solutions worksheet, prepare a list of the action items needed to implement the proposed solutions.

- **1/7/99: Prepare an action plan:** Complete the action plan. Recommendation for public review of the draft Plan.

- **1/28/99: Public information meeting:** Solicit public input on the draft plan.

The Flood Mitigation Planning Committee met again in 2000 to review and update the *Flood Mitigation Action Plan, Town of Elmira*. Participants at the plan revision meetings included the Town Supervisor, a Town Councilman, the Acting Town Drainage Officer, citizen members of the Storm-Water Control Board, the Code Enforcement Officer, and the Regional Flood Mitigation Specialist (with Southern Tier Central Regional Planning and Development Board). Additional comments were incorporated following a Town Board workshop. The following meetings were held to revise and update the plan:

- **9/15/00: Update flood mitigation plan:** Update flood hazard and problem information. Revise flood mitigation goals. Document the public information and flood preventive
activities that were implemented after completion of the July 1999 *Flood Mitigation Action Plan*. Revise the list of flood mitigation action items that relate to town staff resources, public information, and preventive activities.

- **10/30/00: Complete action plan revisions:** Document the natural resource protection, property protection, structural projects, and emergency service activities that were implemented after completion of the July 1999 *Flood Mitigation Action Plan*. Revise the list of flood mitigation action items that relate to natural resource protection, property protection, structural solutions, and emergency services.

- **11/28/00: Town Board workshop:** Present the draft plan revisions to the Town Board. Discuss and incorporate comments of the Town Councilmen.

In November 2002, the Town Supervisor appointed a Hazard Mitigation Planning Committee to update the information in the *Flood Mitigation Action Plan* and expand the plan to incorporate other hazards. The committee consisted of the Town Supervisor, three Town Councilpersons, the Code Enforcement Officer, the Town Highway Superintendent, the West Elmira Fire Chief, the West Elmira Police Chief, the Acting Town Drainage Officer, and citizen members. This committee participated in the following meetings:

- **11/19/02: Hazard mitigation planning workshop/organizational meeting:** Committee representatives attended a hazard mitigation planning workshop conducted by the State Emergency Management Office, followed by a brief organizational meeting.

- **12/16/02: Risk assessment:** Review the *Chemung County Hazard Analysis Report* based on a HAZNY (Hazards New York) workshop on December 1, 1998. For each hazard, assign a tentative priority for the Town of Elmira (later revised). Compile information about historic events, the probability of future occurrences, vulnerable areas, and potential losses.

- **1/27/03: Strategy development workshop:** At a joint meeting with Hazard Mitigation Planning Committees for several municipalities, evaluate mitigation options for high priority hazards. Identify reasonable goals and objectives to mitigate the potential consequences for the following hazards: multi-hazard mitigation, hazardous material releases (hazardous material released in transit, hazardous material released from a fixed site, petroleum spill, explosion, radiological release in transit), severe weather (severe storm, severe winter storm, ice storm, tornado, extreme temperatures), transportation safety (transportation accident, hazardous material released in transit), and terrorism.

- **5/1/03: Hazard analysis:** The Chemung County Emergency Management Office facilitated a hazard analysis for the Town of Elmira using the HAZNY computer program developed by the NY State Emergency Management Office.

- **5/22/03: Prepare an action plan:** Review and revise draft mitigation strategy. Prepare a mitigation action plan that includes measures that will be implemented through existing programs and proposed projects for which additional resources are needed. Identify plan maintenance procedures.

- **8/21/03: Public information meeting:** Solicit public input on the draft plan.
PUBLIC INVOLVEMENT

The Town of Elmira has had active citizen involvement in flooding and stormwater management issues since October 1994. The Town’s Storm-Water Control Board consists of concerned citizens who have interacted regularly with the public on storm-water and flooding issues. The concerns and suggestions that have been voiced to committee members were incorporated into this planning process. The Chairman and several members of the Storm-Water Control Board participated in planning committee meetings. Updates on the flood mitigation planning process and requests for additional input were presented at monthly meetings of the Storm-Water Board. An effort was made to involve citizens that are not members of the Storm-Water Control Board on the planning committee as well. Citizens participated in both the flood mitigation planning meetings (approximately half of the attendees at each meeting were members of the public) and the hazard mitigation planning meetings.

Additional public input was sought throughout the planning process. A letter was sent to the managers of 2 flood-prone facilities at the beginning of the flood mitigation planning process. A local real estate agent was contacted personally and asked to provide input. A fact sheet about the Town’s hazard mitigation planning process was posted in Town Hall (included in Attachment B). Two press releases were issued, announcing development of the all-hazard mitigation plan and requesting public input.

A draft of the Flood Mitigation Action Plan, Town of Elmira was presented at a public information meeting on January 28, 1999. This meeting was publicized in the local newspaper (clipping in Attachment B). The meeting consisted of an informal discussion of flooding issues, concerns, and mitigation measures. A large-format copy of the Flood Hazards and Problems map (Attachment A) was displayed for review and discussion. Each participant was given a handout summarizing the flood mitigation planning process (included in Attachment B) and the Action Plan section of the draft document. Copies of the entire Plan were available for review. Those in attendance were supportive of the Plan and of the Town’s efforts to address flooding problems. Although a number of questions were asked, no changes to the Plan were recommended. Most of the questions concerned details of the Beecher Creek Detention Pond, which was under construction at the time of the public meeting.

The August 9, 2003 flooding was discussed at a regular meeting of the Elmira Town Board on August 18. West Elmira residents alerted the Board to numerous localized drainage problems and requested assistance with replacement of driveway drainage pipes that were washed out, cleaning debris from drainage ditches, cleaning clogged culverts, etc. Town staff met with these and other residents (before and after the Board meeting) to resolve these problems. Town officials answered questions about insurance and the potential for disaster assistance. One resident thanked the Town for Larchmont Road detention pond, which prevented considerable damage to his house, and for clearing out drains during the storm. Another resident suggested that the Town create a “community sand bag program.” Minutes of this meeting are included in Attachment B.
A draft of the *Town of Elmira Hazard Mitigation Action Plan* was presented at a public information meeting on August 21, 2003. This meeting was publicized in the local newspaper, notices posted in public areas (copy in Attachment B), direct mailing (to municipal officials, agency personnel, and elected officials), an announcement at the Town Board meeting, and by word of mouth. Each participant at the public meeting received a copy of the Executive Summary of the draft plan. The Town Code Enforcement Officer led an informal discussion about hazard mitigation and the draft hazard mitigation plan. The conversation focused on the recent hazard incidents and the lessons learned. The August 9, 2003 flood resulted from intense rainfall (4-5 inches) over only a few hours, which exceeded the design capacity of the drainage system. Participants indicated that water was 3 to 4 feet deep on Church Street and estimated that more than 75 houses had water damage (due to both surface flow and groundwater pressure). The suggestion (made at the Town Board meeting) that the Town organize a “community sand bag program” was discussed and recommended for inclusion in this plan. Participants felt that the widespread power outage on August 15-16, 2003 may be an indication that power outages should no longer be considered an uncommon event. This event highlighted the need for a generator to supply electricity to the East Hill Highway Garage. Communication problems during recent events also highlighted the need for a repeater to improve Town Highway Department radio communication.

Copies of the draft plan were distributed to municipal officials and were available at the Town Hall for review by the public. All comments received during the plan review period and at the public meeting have been evaluated and incorporated into the plan, as appropriate.

Once this plan is finalized, the Town of Elmira plans to post it on the Town website. This will provide an ongoing opportunity for public review and comment.

**COORDINATION WITH AGENCIES**

County, regional, and state agencies were contacted for relevant information and recommendations about the flood mitigation planning effort and the subsequent hazard mitigation planning effort. Personnel from these agencies attended planning meetings, provided information, answered questions, reviewed minutes, and reviewed draft sections of the documents. The contributions from agencies and organizations that contributed to this planning process are summarized below:

- **Chemung County Emergency Management Office** – attended planning committee meetings; reviewed minutes and draft text; presented information about emergency services at the Flood Solutions Workshop; met separately with the plan facilitator to provide risk assessment information and mitigation strategy recommendations; facilitated hazardous analysis workshop for the Town of Elmira; answered numerous questions

- **Chemung County Soil and Water Conservation District (County Hazard Mitigation Coordinator)** – provided information about channel stabilization and flood mitigation; reviewed minutes and draft text; responded to questions; presented information about natural
• Chemung County Planning Department – reviewed minutes and draft text; met with the plan facilitator; utilized GIS data to provide population and property value information for use in the damage estimates

• Elimira-Chemung Transportation Council – met with the plan facilitator to provide information about transportation safety initiatives; provided information from the crash database for vulnerability assessment

• Chemung County Environmental Management Council – reviewed minutes and draft text; presented recommendations about public information measures at the Flood Solutions Workshop

• Chemung County Health Department – was notified of the hazard mitigation planning process; did not have relevant information

• Chemung County Water Quality Strategy Committee – received reports on the planning process

• Chemung County Public Works Department – was notified of the flood mitigation planning process and the hazard mitigation planning process; did not have relevant information

• American Red Cross – attended planning committee meeting; provided copies of brochures used for public outreach; provided estimate of sheltering expenses for use in the damage estimates; provided information about the Community Disaster Education program

• Steuben County Planning Department – presented information about land use planning at the Flood Solutions Workshop

• Steuben County Soil and Water Conservation District – presented information about stormwater management and drainage system maintenance at the Flood Solutions Workshop

• Steuben County Emergency Management Office – presented information about emergency services at the Flood Solutions Workshop

• Southern Tier Central Regional Planning and Development Board – facilitated development of both the flood mitigation plan and the all hazard mitigation plan; presented recommendations about floodplain regulations at the Flood Solutions Workshop

• Sullivan Trail Resource Conservation and Development Council – was notified of the flood mitigation planning process; did not have relevant information

• New York State Emergency Management Office – reviewed minutes and draft text; presented information about property protection measures at the Flood Solutions Workshop; conducted a Hazard Mitigation Planning Workshop; met with the plan facilitator to provide guidance with the hazard mitigation planning process; provided damage information for disasters that occurred in other parts of the state for use in preparing damage estimates

• New York State Department of Environmental Conservation, Regional Flood Control Engineer – reviewed minutes and draft text; presented information about structural flood control measures at the Flood Solutions Workshop; provided information about flooding and ice jams; responded to questions

• New York State Department of Environmental Conservation, Regional Spills Engineer – attended planning committee meetings; reviewed minutes and draft text; met with the plan facilitator to provide information about hazardous material incidents; responded to questions

• New York State Department of Transportation – was notified of hazard mitigation planning process; did not have relevant information
• National Weather Service – provided statistical information about past weather hazards; responded to questions
• Federal Emergency Management Agency – reviewed and approved *Flood Mitigation Action Plan, Town of Elmira*
• USDA Natural Resources Conservation Service – was notified of the flood mitigation planning process and hazard mitigation planning process; did not have relevant information

**ADOPTION OF PLAN**

This plan and each subsequent revision will be presented to the Elmira Town Board for formal adoption. All resolutions related to this plan are in Attachment B.
SECTION 4 – RISK ASSESSMENT

In order to prepare for and mitigate the consequences of hazardous events, it is necessary to understand the local vulnerability. Vulnerability is based on the natural and man-made factors that determine the probability of an event occurring and community factors that contribute to the severity of the impacts.

A quantitative risk assessment for the Town of Elmira was conducted using the HAZNY program developed by the New York State Emergency Management Office. HAZNY is an automated interactive spreadsheet that enables a group of local experts to rank hazards based on the scope (area of impact and potential for a cascade effect), frequency, impact, onset (warning time), and duration of each hazard considered. The Chemung County Emergency Management Office facilitated a HAZNY assessment for the Town of Elmira on May 1, 2003. Participants included the Town Supervisor, a Town Councilman, West Elmira Fire Chief, Town of Elmira Police Chief, Stormwater Coordinator, Code Enforcement Officer, County Director of Fire and Emergency Services, County Safety Coordinator, and Regional Flood Mitigation Specialist. Weather hazard information provided by the National Weather Service was used in the analysis. Participants also utilized information from the Chemung County HAZNY analysis, for which participants included the Chemung County Health Department, County Sheriff, NYS Spills Engineer, NYS Regional Flood Control Engineer, County Emergency Management Office, and Regional Flood Mitigation Specialist. The group evaluated 29 natural, technological, and human caused hazards that can potentially impact the Town of Elmira. The hazard rankings derived from this HAZNY analysis are presented below (with numerical HAZNY rating scores on a scale of 44 to 400). These hazard ratings were used as the basis for prioritizing hazards in this mitigation plan.

<table>
<thead>
<tr>
<th>High Hazards:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood</td>
<td>358.8</td>
</tr>
<tr>
<td>Hazardous material – in transit</td>
<td>355.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Moderately High Hazards:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe storm</td>
<td>287.2</td>
</tr>
<tr>
<td>Ice storm</td>
<td>271.2</td>
</tr>
<tr>
<td>Extreme temperatures</td>
<td>261.2</td>
</tr>
<tr>
<td>Utility failure</td>
<td>260.2</td>
</tr>
<tr>
<td>Severe winter storm</td>
<td>252.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Moderately Low Hazards:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrorism</td>
<td>240.2</td>
</tr>
<tr>
<td>Explosion</td>
<td>240.2</td>
</tr>
<tr>
<td>Oil spill</td>
<td>238.5</td>
</tr>
<tr>
<td>Wildfire</td>
<td>237.8</td>
</tr>
<tr>
<td>Earthquake</td>
<td>235.8</td>
</tr>
<tr>
<td>Ice jam</td>
<td>234.8</td>
</tr>
<tr>
<td>Tornado</td>
<td>234.2</td>
</tr>
<tr>
<td>Transportation accident</td>
<td>233.5</td>
</tr>
</tbody>
</table>
The following assessment evaluates the risks associated with each hazard that was given a high or moderately high ranking in the Town of Elmira (in order of priority). Assessments for the moderately low and low priority hazards are included in Attachment C. The responses used for the HAZNY assessment are presented, along with additional information about historic occurrences and vulnerabilities. Those hazards that were not assessed because they are not applicable to the Town of Elmira are also listed in Attachment C.

#1. FLOOD/FLASH FLOOD

Definition: Flooding usually is a natural, cyclic occurrence in existing waterbodies or drainage ways. When a waterbody overflows its “normal” banks, a potentially violent and/or destructive waterway can form. A flash flood is a sudden transformation of a small stream into a violent waterway after heavy rain and/or rapid snowmelt. Urban flooding occurs in developed areas where the drainage system is inadequate to safely convey runoff.

HAZNY analysis:
- **Scope:** Large region is vulnerable
- **Cascade effects:** Highly likely to trigger another hazard
- **Frequency:** Frequent event (occurs more than once a year)
- **Onset:** No warning
- **Hazard duration:** Two to three days
- **Incident stabilization:** More than two weeks of overtime emergency operations
- **Potential impact:** Serious injury or death is likely, but not in large numbers
  - Severe physical and/or economic damage to private property
  - Severe structural damage to community infrastructure
Past hazard events: Flooding is New York’s most consistently damaging natural disaster. Since 1955, New York has recorded more flood events than any other state in the northeast. Millions of dollars of flood losses are sustained each year due to private property damage, infrastructure damage, disruption of commerce, unemployment caused by floods, the expense of disaster relief, and other related costs. Annual economic losses throughout the state are estimated to be as high as $100 million (source: *Draft New York State All Hazard Mitigation Plan*, prepared by Mitigation Section, New York State Emergency Management Office, April 2003).

Since the early 1800s, major flooding has occurred along the Chemung River about every 20 years. The National Weather Service has documented 23 flooding events in Chemung County in the past 10 years. These events range from localized occurrences to major floods. Although many of these flood events caused only localized or minimal damages, some have been quite severe.

Noteworthy floods include:

- **July 1935, Finger Lakes Flood**: A complex of thunderstorms produced flash flooding throughout south central New York and northern Pennsylvania; more than forty deaths were recorded; damages ran in the hundreds of millions of dollars.
- **May 1946**: Severe thunderstorms caused the Chemung River to crest at an all-time high with heavy losses throughout the watershed.
- **June 1972, Tropical Storm Agnes**: The inland remnants of Hurricane Agnes dropped 12 to 18 inches of rain in a three day period across the mid-Atlantic states. Record breaking discharges in the Chemung River overtopped the levee and inundated low-lying areas in the Town of Elmira. Torrents of water caused serious erosion problems along many of the Town’s tributary streams. This catastrophic flood resulted in deaths, mass evacuations, and destroyed homes. Fires that broke out could not be extinguished. Many bridges were washed away. Damaged infrastructure led to transportation problems, power outages, lack of communication, water supply interruption, a brief food shortage, etc.
- **September 1975, Tropical Storm Eloise**: Heavy rain from the inland remnants of Hurricane Eloise caused another river flood that damaged and destroyed numerous buildings.
- **June 1976, Fathers’ Day Flood**: Severe thunderstorms caused damage in the millions of dollars in Steuben and Chemung Counties.
- **April 1993, “Blizzard of ’93” snowmelt**: Rapid snowmelt caused urban and small stream flooding.
- **August 1994, Topical Storm Beryl**: Heavy rain associated with the remnants of Hurricane Beryl caused flash flooding in southern Chemung County. Numerous buildings were flooded and roads were damaged.
- **January 1996**: Heavy rainfall melted a deep snow pack (over 3 feet in spots) and produced widespread flash flooding and river flooding. Flooding and erosion damage to buildings and infrastructure were extensive.
- **November 1996**: Heavy rain caused flash flooding that damaged buildings and washed out roads.
- **February 1998**: Localized rainfall caused flooding of yards and damage to roads in the Town of Elmira.
• June 1998: Thunderstorms with heavy rainfall caused localized flooding problems.
• On August 9, 2003, localized thunderstorms resulted in as much as 5 inches of rain in a few hours in the Town of Southport, City of Elmira, and Town of Elmira. The Acting Drainage Officer for the Town of Elmira described this flood as “worse than the 1972 flood on the high ground in West Elmira. Church and Water Streets were lakes (and rivers)” due to the inability of the storm sewer pipes (to the river) to handle the volume of water. Town officials estimate that more than 75 houses were flooded, either by surface flow or by groundwater flowing into basements. Water levels in the detention ponds on Beecher Creek (at the Elmira Country Club) and Whirt’s Creek (above Larchmont Road) rose over the control structures (but not to the emergency spillways). Although numerous houses were flooded, the damage would have been much worse without the detention ponds.

In addition to these major flood events, many additional heavy rainfall events have caused localized drainage problems, ponding, streambank erosion, roadway damage, and other difficulties.

Probability of future events: Flooding can be caused by excessive precipitation, rapid snowmelt, ice jams, beaver dams, or dam failure. Urban or street flooding can result from heavy precipitation, clogged storm sewers, or a ruptured water main. Steep slopes make the area very prone to flash flooding. Slow-moving thunderstorms often produce flash floods, particularly during summer months. Remnants of tropical storm systems can produce both flash floods and river flooding. Rapid thawing in the winter produces runoff from snowmelt and ice jams. Flooding can occur at any time of year. Although major river floods only occur about once every 20 years, localized flash flooding and urban flooding occur much more frequently. The National Weather Service has documented an average of 2.3 flood events per year in Chemung County since 1993. The frequency of flooding in the Town of Elmira is somewhat lower, since some of these events were local occurrences impacting other parts of the county and others were relatively minor and did not necessitate emergency response. However, major river flooding, flash flooding, or urban flooding does occur in the Town of Elmira almost every year.

Potential impact: Flooding is the number one weather related killer, causing an average of three to four deaths per year in New York. Approximately half of those deaths involve people trapped in cars. Floods and flash floods also damage or destroy buildings, cars, utility poles, gas lines, roads, bridges, etc. Transportation and communication systems can be interrupted. Drinking water can be contaminated. Electric power and sewage treatment can be disrupted. Floodwaters often carry damaging debris, which can pose a risk to both life and property. Erosion of streambanks and road ditches has historically caused significant infrastructure damage in Elmira. Additional hazards that are likely to be triggered by a flood event include: hazardous material release, transportation accident, power failure, fuel shortage, water supply contamination, food shortage, landslide, disease, and dam failure. The damages and consequent recovery time from a major flood can be extensive.

Vulnerable areas: The locations of flood hazards and the history of damages from flooding are described in Attachment D. The Flood Hazards and Problems map in Attachment A shows the
sites where flooding problems have occurred or are anticipated. This information is summarized in the Summary of Flooding Problems table in Attachment A. More than 100 buildings in the Town of Elmira are in locations susceptible to flood or erosion damages from riverine flooding, flash flooding, urban flooding (drainage and ponding problems), or groundwater flooding (due to shallow water table). Less than half of these buildings are located within the area mapped as 100-year floodplain. Many additional structures are located within the 500-year floodplain in an area protected from a 100-year design flood by a flood control levee. In addition, numerous structures are located near small streams in areas that are at risk, but are not identified as flood-prone on the Flood Insurance Rate Maps. Damages in these areas can result from small stream flooding, streambank erosion, flooding due to debris dams, or groundwater flooding of basements. Some homes routinely experience flooding of basements and yards. In recent years, the Town of Elmira has invested in numerous projects to stabilize streams, alleviate drainage problems, and mitigate flood risks.

Estimate of potential losses: The Town estimates that about 100 buildings are located in areas prone to flood damage. If these at-risk structures sustain average flood damages of $10,000, the total flood damages to buildings would be about $1 million. The damages would be much greater if the flood control levee is overtopped or fails. In addition, the damages to roads and bridges could also be several million dollars. (The Town of Southport spent $1.3 million replacing a bridge over Bird Creek that washed out in 1996.)

#2. HAZARDOUS MATERIAL RELEASED IN TRANSIT

Definition: The uncontrolled release of material during transport, which when released can result in death or injury to people and/or damage to property and the environment through the material’s flammability, toxicity, corrosiveness, chemical instability and/or combustibility.

HAZNY analysis:
- **Scope:** Large region is vulnerable
- **Cascade effects:** Highly likely to trigger another hazard
- **Frequency:** Frequent event (occurs more than once a year)
- **Onset:** No warning
- **Hazard duration:** Four days to one week
- **Incident stabilization:** One week to two weeks of overtime emergency operations
- **Potential impact:** Serious injury or death is likely, but not in large numbers
  - Severe physical and/or economic damage to private property
  - Severe structural damage to community infrastructure

Past hazard events: The most frequent occurrences of hazardous material releases in Chemung County involve the release of petroleum products and other substances as a result of transportation crashes. The NYS Department of Environmental Conservation responds to about 90 spills per year in Chemung County. About half of these reported spills involve the release of
materials in transit. The DEC Spills Engineer estimates that 95% of the spills involve petroleum products. Noteworthy incidents in Chemung County have included:

• In the late 70’s or early 80’s, a railroad car spilled sodium hydroxide in the hamlet of Big Flats.
• A train derailment in the Town of Big Flats involved cars containing propane and sulfuric acid.
• Sulfuric acid was spilled from a truck at a loading dock in the Town of Big Flats. A couple of people were treated for burns.
• Toluene was released at a truck terminal in the Town of Elmira when a drum was punctured during unloading. One person was injured.
• A truckload of agricultural chemicals shifted in transit; the damage was discovered at the loading dock of a farm supply store in the Town of Horseheads.
• A pipeline in the Town of Southport (located near the Pennsylvania Avenue Bridge in Pine City) was exposed by erosion during the August 1994 flood.
• A high-pressure natural gas pipeline under Clark Hollow Creek in the Town of Southport was exposed by erosion during the November 1996 flood. It is reported that the outer casing of this pipeline appeared to be rusted and cracked. Subsequent sedimentation has covered the pipeline, but no protective measures have been taken.

Probability of future events: The Town of Elmira occasionally has transportation crashes that result in the release of hazardous materials. Fortunately, these incidents generally involve small quantities of material. The potential also exists for a more serious incident involving a pipeline failure, train derailment, or tank truck crash that releases large volumes of hazardous materials.

Potential impact: The packaging used to ship hazardous material generally prevents catastrophic releases of highly toxic substances. However, transportation accidents resulting in the release of hazardous materials can result in fire, explosion, toxic fumes, water supply contamination, agricultural damage, or environmental contamination. If an acutely toxic substance is dispersed in the atmosphere, the area of concern can extend as far as 10 miles from the site of the release. Rupture of a natural gas pipeline can cause an explosive force sufficient to level buildings. An overturned tanker or derailed tank car may take a week or more to mitigate. If contaminants are dispersed into the environment, the cleanup can take years.

Vulnerable areas: The transportation routes through the Town and the areas that have historically been vulnerable to transportation accidents are shown on the Transportation Infrastructure map in Attachment A. Although a transportation accident involving hazardous materials could occur on county and town roads, the probability is greatest along the railroad line and the state highways (Routes 352 and 17). These principal transportation routes pass through heavily populated areas of the Town. A railroad passes through the Town in the area south of the Village of Elmira Heights. Route 352 carries traffic through residential areas on Church and Water Streets in West Elmira. There are also two truck terminals in the Town. A hazardous material spill at the McCann’s Boulevard underpass could result in contamination of the pump station. Hazardous materials are transported to farms on steep rural roads. Natural gas transmission pipelines and distribution lines are also vulnerable. The erosive nature of the Town’s streams poses a threat to
shallow pipelines in the valleys or at stream crossings. Most of the residents and businesses in the Town of Elmira are located within one mile of a railroad, state highway, or pipeline.

Estimate of potential losses: A credible worst-case hazardous material incident could result from an accident that ruptures a railroad car or tractor trailer containing hazardous materials. If the released material is subject to atmospheric dispersion, the radius of concern could be as much as 10 miles (for example, ammonia, chlorine, or nitric acid). If a release occurs at the Route 352 point (where Church and Water Streets meet) and requires evacuation of a 5-mile radius, 5,841 Town of Elmira residents would be displaced (81% of Town residents). The estimated cost of sheltering these residents would be at least $150,000 (based on a Red Cross estimate that sheltering expenses are in the range of $25-100 per person per day). In addition to the emergency response expenses, casualties, and medical expenses, the property damage and environmental cleanup costs resulting from a hazardous material release could be hundreds of thousands of dollars. The assessed value of property within one mile of the Route 352 point is $226,400,652. The release of a corrosive substance could necessitate cleanup and repair costs exceeding $5 million (based on an average expense of 10% of the assessed value within a 90° sector, extending one mile from the site in the worst-case wind direction).

#3. SEVERE STORM

Definition: Severe storms include hail storms, windstorms, and severe thunderstorms (with associated severe wind events). A thunderstorm is a local storm produced by a cumulonimbus cloud and is accompanied by lightning and thunder. Thunderstorms are often accompanied by gusty winds, heavy rain, and occasionally by hail. Although all thunderstorms are potentially hazardous, the National Weather Service classifies a thunderstorm as severe if it produces winds greater than 57 mph or hail ¾ inch in diameter or larger. (This definition does not include tornadoes, which are evaluated as a separate hazard.)

The damaging winds of thunderstorms include:
- Straight line winds – high winds across a wide area.
- Downbursts – localized currents of air blasting down from a thunderstorm, which induce an outward burst of damaging wind on or near the ground.
- Micro-bursts – minimized downbursts covering an area of less than 2.5 miles across. They induce a strong wind shear (a rapid change in the direction of wind over a short distance) near the surface. Micro-bursts may or may not include precipitation and can produce winds over 150 miles per hour.

HAZNY analysis:
- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)
- Onset: No warning
- Hazard duration: Less than one day
• Incident stabilization: One to two days of overtime emergency operations
• Potential impact: Serious injury or death is unlikely
  Moderate physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: New York experiences an average of 323 severe thunderstorms each year. Nine to ten people per year die from thunderstorm winds, usually due to trees falling on a house or car. New York State ranks forth in the nation for lightning deaths (an average of 3 per year) and fifth for lightning injuries (an average of 13 per year). National Weather Service records for Chemung County include 60 severe weather reports in the twenty years from 1983 to 2002. Thirteen of these storms had hail greater than 0.75 inches in diameter and three had “killer hail” greater than 1.5 inches in diameter (based on severe weather spotter reports).
  • In 1974 (Easter), a garage in the Town of Big Flats blew apart and lumber lodged in nearby houses. The roof blew off of a house. Another house lost part of a wall.
  • Severe winds (perhaps associated with an unconfirmed tornado) caused a band of severe forest damage in the Dry Run and Christian Hollow areas of the Town of Southport.
  • A windstorm in the Town of Chemung tore down electric transmission towers and damaged homes and barns (sometime in the 1980’s).
  • In November 1989, a severe thunderstorm produced winds estimated at 110 mph at Coldenham, NY. Strong winds collapsed the wall of an elementary school, killing 9 children and injuring 18.
  • In 1998, a system of severe thunderstorms spawned at least 20 tornadoes in northeast Pennsylvania and central New York. Although no tornadoes touched down in Chemung County, the storms also produced large hail (up to 2 inches in diameter), which damaged cars in the Towns of Horseheads and Elmira.
  • On Labor Day, 1998, the Syracuse region was struck by very severe winds from a thunderstorm, with estimated wind speeds of around 110 mph. Two people were killed.
  • On July 21, 2003, a system of severe thunderstorms swept through Steuben and Chemung Counties. Downed limbs and trees impeded transportation and caused localized damage. Near100 mph winds destroyed a mobile home in the Town of Woodhull (Steuben County). Approximately 36,000 NYSEG customers lost electric power; some rural customers were without electricity for several days. Local stores and restaurants lost perishable foods.
  • Small short-lived tornado-like storms (also known as gustnados) have been reported, including two in the Town of Big Flats in the 1970’s.

Probability of future events: In recent years, Chemung County experienced severe weather reports an average of three times per year, with the frequencies in neighboring counties ranging from two to five events per year. In Chemung County, hail occurred 0.65 times per year and killer hail 0.15 times per year. Because severe thunderstorms and hail are generally localized events, the probability of occurrence in the Town of Elmira is lower than these county statistics would indicate.

Potential impact: Although tornadoes grab headlines due to their swift and destructive nature, flash floods, lightning, straight-line winds, and hail are more common by-products of
thunderstorms and result in many more deaths and millions of dollars in damage each year. Large hail can impact surfaces at speeds greater than 100 mph, causing injury and property damage. Thunderstorms have the potential to spawn tornadoes or trigger utility failures, transportation accidents, flash flooding, and fires. Most thunderstorms occur during the late afternoon and evening hours of spring and summer, which coincides with the season of outdoor activities. The impacts of severe thunderstorms and hailstorms are usually localized.

Windstorms involve sustained, potentially damaging, high winds. Straight-line thunderstorm winds occasionally exceed 100 mph. Major high-wind events can extend horizontally for hundreds of miles. The duration of the event ranges from about 4 hours up to 2 to 3 days, usually with nocturnal lulls. The greatest dangers from high winds are: roof failure, breaking glass, and flying debris (airborne missiles). Strong winds can knock down trees, utility poles, and power lines. They can damage or destroy buildings, vehicles, and crops. Blowing dust can impair visibility. Debris can block transportation routes. If the strong wind occurs in conjunction with a winter storm, it can create wind-driven snow, severe drifting, and dangerous wind chill. The New York State Building Code requires construction for a design wind speed of 90 mph. Beginning in January 2003, the building code includes higher wind standards for structures that represent a higher hazard to human life in the event of failure.

Vulnerable areas: The entire Town is vulnerable to damage from thunderstorms, hail, or wind. Those most at risk from lightning are people who are outdoors, especially under or near tall trees, in or on water, and on or near hilltops. Severe storms occasionally produce strong winds that exceed the design speeds of building codes and can thus impact the entire Town. The most severe damage from wind would be expected in mobile homes, farm buildings, and other structures that may not have been constructed to withstand high wind speeds. Agricultural areas may experience financial losses associated with crop damage.

Estimate of potential losses: The most devastating damages from severe storms (in addition to the potential to trigger tornadoes and floods) are likely to result from high winds. Wind speeds in excess of 100 miles per hour can cause damages comparable to those from a moderate-intensity tornado. If a severe windstorm impacts a developed area within the Town, the potential damages could exceed a million dollars.

#4. ICE STORM

Definition: Freezing rain that accumulates in a substantial glaze layer of ice resulting in serious disruptions of normal transportation and possible downed power lines.

HAZNY analysis:
- **Scope:** Large region is vulnerable
- **Cascade effects:** Highly likely to trigger another hazard
- **Frequency:** Regular event (occurs once every one to seven years)
- **Onset:** One day warning
- Hazard duration: Two to three days
- Incident stabilization: More than two weeks of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  - Moderate physical and/or economic damage to private property
  - Severe structural damage to community infrastructure

**Past hazard events:** National Weather Service records for Chemung County indicate that ice storms occurred three times in the ten years from 1993 to 2002. The National Weather Service is typically able to provide 12 to 24 hours of advanced warning for these events.

- An ice storm in 1991 resulted in massive power outages throughout an area extending from Steuben County to Rochester.
- A January 1998 ice storm impacting six counties in the North Country region of New York was one of the most severe in the state’s history. Nine people were killed, most by carbon monoxide poisoning associated with alternate heating devices. Damage was widespread. During the peak of the storm, more than 320,000 people were without electricity. Power was not completely restored for 23 days. Many dairy farmers lost their cows. The New York State Emergency Management Office documented damages of about $56 million (based on disaster assistance, which does not cover all damages).
- In January 2003, an ice storm led to sporadic power outages in parts of Chemung County. The power outages occurred in different areas over a several day period, affecting about 500 customers at a time. In Tompkins County and northeastern Chemung County, 1000 customers were without power for 4 days. Only 10% of those affected sought shelter with the Red Cross. No shelters were opened in Chemung County.

**Probability of future events:** The National Weather Service reports that southern New York has one of the highest incidences of ice storms in the U.S., with freezing rain and icing occurring somewhere in this region about 10 days per year. An ice storm as severe as the 1998 North Country disaster could also occur in Chemung County. In recent years, Chemung County experienced significant ice accumulation an average 0.3 times per year (or every three years). These events have typically lasted for one to two days.

**Potential impact:** When ice encases exposed surfaces, hazardous road conditions disrupt transportation. The weight of the ice can knock down trees and power lines, disrupting power and communication for days. Additional hazards that can be triggered by an ice storm include: transportation accidents, power failure, fuel shortage, and food shortage. Normal emergency operations, such as police, fire and ambulance service, can also be impeded. Since the same conditions may occur over a large area, aid from neighboring jurisdictions may not be available.

**Vulnerable areas:** The entire Town is vulnerable to the impact of ice storms.

**Estimate of potential losses:** The 1998 North Country ice storm resulted in power outages for 320,000 people in seven counties and documented disaster assistance totaling $55,950,736 (source: New York State Emergency Management Office). This corresponds to average damages of about $175 per person. These statistics do not include all damages and the average is...
much lower than the damages incurred in the most severely impacted areas. If the Town of Elmira (2000 census population 6,167, excluding the Village of Elmira Heights) experiences an ice storm with damages of $175 per person, the losses would be about $1.1 million.

#5. EXTREME TEMPERATURES

Definition: Extended periods of excessive cold or hot and humid weather with a serious impact on human and/or animal populations particularly elderly and/or persons with respiratory ailments.

HAZNY analysis:
- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)
- Onset: One day warning
- Hazard duration: Four days to one week
- Incident stabilization: Less than one day of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  - Moderate physical and/or economic damage to private property
  - Moderate structural damage to community infrastructure

Past hazard events: National Weather Service records for Chemung County indicate that extreme cold (minimum temperature –10 degrees F or below) occurred 19 times in the twenty years from 1983 to 2002 and extreme heat (maximum temperature 100 degrees F or above) occurred 3 times in the same period. The National Weather Service is typically able to provide 12 to 24 hours of advanced warning for these events.

Probability of future events: Cold winter temperatures are a normal occurrence in Chemung County, occurring an average of about once per year and lasting 1 to 7 days. Extreme heat occurs an average of once every seven years and lasts 1 to 7 days. These extreme temperature conditions generally impact only a few isolated individuals. However, compounding circumstances, such as severe winter weather that strands motorists or an extended power failure, can increase the number of people affected. U.S. Centers for Disease Control estimates that an average of 384 people per year die from excessive heat, but few of these occur in upstate New York. Excessive heat or cold that impacts a significant portion of the population, is an infrequent occurrence.

Potential impact: Freezing temperatures can cause problems with burst pipes, ruptured water mains, and automobiles that will not start, but the greatest danger is to people. Prolonged exposure to extreme cold can lead to frostbite, hypothermia, and death. New York statistics for deaths attributed to exposure to cold indicate that 50% are people over 60 years old, over 75% are males, and about 20% occur in the home (source: National Weather Service). If extreme cold conditions do not occur in combination with a power failure or other hazard, the greatest impact will be on low-income residents who do not have access to adequate heating. If a
prolonged power outage occurs during cold weather the entire population will be impacted. Injury and deaths can result from fires or carbon monoxide poisoning that result from unsafe use of alternate sources for heating. Extreme cold can also cause damage to livestock, crops, landscaping, and other property.

There are practical problems that can result from high temperatures, such as overheated car engines, “brownouts” from overuse of electricity for air conditioning, and changes in airplanes’ performance. However, as with extreme cold, the major danger of extreme heat is to humans and animals. Heat-related ailments can range from annoying conditions to life-threatening situations, such as heat cramps, fainting, heat exhaustion, and heatstroke. Those most at risk are those with health conditions (respiratory ailments, overweight, alcohol problems, etc.) or those on certain medications or drugs.

**Vulnerable areas:** The people most often affected by extreme temperatures are elderly people and infants. At any one time, the Town may have a few homeless people, who would also be vulnerable to extremely cold conditions. Low-income residents may be unable to adequately heat their homes. Residents who are vulnerable to extreme temperature conditions, due to limited income or health concerns, are scattered throughout the Town.

**Estimate of potential losses:** Although extreme temperatures can result in serious injury or death, the number of people impacted is typically small. Frozen pipes and ruptured water mains can cause thousands of dollars in property damage.

### #6. UTILITY FAILURE

**Definition:** Loss of electric and/or natural gas supply, telephone service, or public water supply as a result of an internal system failure and as a secondary effect of another disaster agent.

**HAZNY analysis:**
- **Scope:** Large region is vulnerable
- **Cascade effects:** Some potential to trigger another hazard
- **Frequency:** Frequent event (occurs more than once a year)
- **Onset:** No warning
- **Hazard duration:** Less than one day
- **Incident stabilization:** Less than one day of overtime emergency operations
- **Potential impact:** Serious injury or death is unlikely
  - Moderate physical and/or economic damage to private property
  - Little or no structural damage to community infrastructure

**Past hazard events:** Localized utility failures occur relatively frequently in the Town of Elmira, but service is typically restored within a few hours.
- In the early 1990’s, a transformer failure resulted in loss of power in the northern half of Chemung County for about 6 hours.
• Brownout incidents in the mid-1960’s impacted the entire northeast.
• In 2003, the telephone company briefly lost the capability to call toll free numbers from parts of Chemung County.
• A private water system serving the Harris Hill Manor area in the Town of Big Flats was unable to supply water for about three days. This failure resulted from poor maintenance of the private system, which was subsequently taken over by the Town of Big Flats in 1992 (now District 4).
• On August 15-16, 2003, a major failure of the electric power grid affected 50 million people in seven U.S. states and parts of Canada. Power was interrupted for 80% of New York State residents.
• High winds, ice storms, snowstorms, and floods frequently contribute to power outages and other utility failures. Many utilities were disrupted following the 1972 flood. It took several days to fully restore power following a 1991 ice storm, a mid-1990’s snowstorm, and a July 2003 windstorm.
• Telephone systems are occasionally overloaded during severe weather, particularly when schools are closed.
• During a July 2003 flood, a reservoir dike broke in the village of Nunda (Livingston County) and cut the Village’s 10-inch water main supply, causing major service disruption.

Probability of future events: A widespread and prolonged utility outage is most likely to occur as a cascade effect of another hazard (severe winter storm, ice storm, windstorm, flood, etc.). These incidents are evaluated elsewhere under the triggering event. The loss of power generally results from damage to power lines (due to wind, ice, traffic accidents, etc.) or transmission equipment (often resulting from animal damage). Telephone service can be lost due to overloaded systems, mechanical problems, or damage to phone lines. The Elmira Water Board can have service interruptions due to treatment or distribution problems, but protection against a prolonged disruption is provided by interconnections with neighboring municipal water supplies (Big Flats and Horseheads). The Elmira Water Board has conducted a vulnerability assessment in compliance with federal requirements and is presently addressing all identified security deficiencies. The ongoing maintenance and operational procedures of each utility provider are intended to minimize the risk of service disruption. Although a utility failure of some sort impacts the Town relatively frequently, it is unlikely that a prolonged outage will occur independently of a triggering disaster.

Potential impact: Due to our widespread reliance on electricity, telephones, and potable water, the loss of these services can disrupt many ordinary activities. Emergency communications may be impaired if it becomes necessary to rely on radio communication. A water supply failure can result in an increased fire hazard if it becomes necessary to transport water to areas normally served by fire hydrants. A prolonged power failure can impact heating, food (spoilage, inability to cook), water supplies, industrial processes, and businesses. The most likely cause of injury or death is from unsafe use of alternate fuel sources for heating, cooking, and lighting. Essential services and emergency operations can continue to function during a power outage. Generators are available to provide emergency power for each fire department serving the Town, the Town highway garage, the Elmira Water Board, and area hospitals.
Vulnerable areas: The entire Town is vulnerable to the potential impacts of an electricity or telephone outage. The Elmira Water Board serves about 2,090 customers in West Elmira.

Estimate of potential losses: An extended utility outage in the Town of Elmira would represent an inconvenience for most residents, with economic losses for some businesses. The greatest economic loss would be for the utility itself, which must provide the crews and equipment to restore service. If a power outage results in 10% of the Town residents seeking overnight shelter with the American Red Cross, the anticipated expense would be about $50,000 (based on a Red Cross estimate that sheltering expenses are in the range of $25-100 per person per day, with higher amounts for overnight sheltering). Anchor Glass could incur losses in the hundreds of thousands of dollars if they are unable to maintain operations. However, this is unlikely because they use natural gas for their furnaces, with electricity as a supplemental energy source.

#7. SEVERE WINTER STORM

Definition: A storm system that develops in late fall to early spring and deposits wintry precipitation, such as snow, sleet, or freezing rain, with a significant impact on transportation systems and public safety. Ice storm is included as a separate hazard. For this analysis, the following could meet this definition:

- Heavy snow – Snowfall accumulating to 6 inches in 12 hours or less.
- Blizzard – A winter storm characterized by low temperatures, wind speeds of 35 miles per hour or greater, and sufficient falling and/or blowing snow in the air to frequently reduce visibility to ¼ mile or less for a duration of at least three hours.
- Severe blizzard – A winter storm characterized by temperatures near or below 10 degrees Fahrenheit, winds exceeding 45 mph, and visibility reduced by snow to near zero for a duration of at least three hours.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)
- Onset: One day warning
- Hazard duration: Two to three days
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Moderate physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: National Weather Service records for Chemung County indicate that heavy snow occurred 32 times in the ten years from 1993 to 2002. The National Weather Service is typically able to provide 12 to 24 hours of advanced warning for these events.
• In March 1993, a major storm event dumped massive amounts of snow from the Gulf Coast States northeastward through New England. At least 243 deaths were attributed to the storm; over 3 million customers were without electricity; damages were estimated at $2 billion. In Chemung County, this storm produced heavy snow and blizzard conditions, with over three feet of snow accumulating in a two-day period. Police officers were transported in snowplows. This storm resulted in a food shortage, which lasted for several days. It was necessary to provide food to those lodging in motels that do not have food service.

• A snowstorm in the mid-1990’s resulted in scattered power outages in Chemung County. Some people were without electricity for several days. Three or four families were sheltered.

Probability of future events: New York experiences severe winter storms each year, resulting in a statewide average of 2 deaths per year. In recent years, Chemung County experienced heavy snow an average of 3.2 times per year. These events have typically lasted for one to two days.

Potential impact: Although the Town of Elmira is accustomed to dealing with winter weather, heavy snowfall or blizzards can exceed the normal capacity of highway departments and emergency crews. Accumulated winter precipitation causes hazardous traffic conditions and disrupts transportation routes. This can leave travelers and rural residents stranded and stop the flow of supplies. Heavy snow accumulation can collapse buildings and knock down trees and power lines. Shoveling snow can cause heart attacks. During a blizzard, snow and strong winds combine to produce a blinding snow (near zero visibility), deep drifts, and life-threatening wind chill. The reduced visibility can lead to extreme transportation problems and fatalities due to exposure. Additional hazards that can be triggered by severe winter weather include: transportation accidents, power failure, fuel shortage, food shortage, structural collapse, landslide, and flooding (if heavy snowfall is followed by rapid melting). Normal emergency operations, such as police, fire and ambulance service, can also be impeded. Since the same storm conditions may occur over a large area, aid from neighboring jurisdictions may not be available.

Vulnerable areas: The entire Town is vulnerable to the impact of severe winter storms.

Estimate of potential losses: The principle cost resulting from winter storms is the expense of snow removal by highway departments, which can impact local budgets in years with a large number of winter storm events. Indirect losses result from the disruption of normal transportation (crashes, closed work places, lack of commerce, etc.). Some structural damage can occur if heavy snow knocks down trees or buildings. Because severe winter storms are a frequent occurrence in the Town of Elmira, these impacts are considered to be “normal.”
SECTION 5 – MITIGATION STRATEGY

The overall purpose of the Town of Elmira Hazard Mitigation Action Plan is to protect life and property from natural and human-caused hazards.

The following mitigation strategy outlines the approach that the Town of Elmira intends to follow in order to reduce its vulnerability to the high priority hazards identified in the previous section. This strategy was developed at a workshop (on January 27, 2003) attended by hazard mitigation planning committees for five neighboring communities that experience similar hazards and risks. This workshop provided a forum for participants to share mitigation ideas and success stories. Following the workshop, numerous agency experts were consulted to refine the draft strategy, which was further refined during the local review and revision process. As part of this strategy development process, committee members reviewed the draft risk assessment information (Section 4 and Attachment C of this plan) to insure that the mitigation strategy incorporates the characteristics of each hazard and the local vulnerabilities. In addition, the goals and objectives that had previously been developed as part of the flood mitigation planning process and other planning efforts were reviewed and incorporated into this mitigation strategy.

Each mitigation goal is a general statement of what the Town of Elmira wishes to achieve in order to reduce its vulnerability to natural, technologic, and man-made hazards. These goals specifically address the highest ranked hazards for the Town of Elmira and focus on those measures that will provide the greatest benefit in hazard reduction. For each mitigation goal, the committee assessed the local circumstances in order to identify the types of activities that are needed to achieve the goal. In addition, information about mitigation techniques (provided by federal, state, and local emergency officials) was reviewed in order to insure that a full range of viable mitigation alternatives was considered. Based on this evaluation, objectives were developed for each goal. Each objective is a measurable statement of what the community would like to achieve. Taken together, these goals and the corresponding objectives represent the overall strategy for reducing the Town’s vulnerability to hazards. The specific implementation measures proposed by the Town are presented in the following section (Section 6).

Many of the mitigation measures recommended in this plan address multiple hazards. More specific recommendations were also developed for the hazards ranked as high priority and moderately high priority. The moderately low and low priority hazards are addressed as part of the multi-hazard mitigation strategy.

MULTI-HAZARD MITIGATION

Goal: Raise public awareness about hazards and how to respond.

Objectives:
• Develop and implement a public outreach and education program about natural/manmade...
hazards and family preparedness. Conduct outreach programs targeting at-risk populations (elderly, young adults, vulnerable neighborhoods, children, etc). Topics should include hazard information, family disaster planning, emergency supplies, how to respond to sirens and other warnings, how to obtain current warning information, how to shelter-in-place, evacuation procedures, “good neighbor” policies, transportation safety, mitigation measures, etc.

- Be available to assist schools with fire, weather hazard, and terrorism education and drills.
- Encourage greater utilization of NOAA Weather Radios by residents, businesses, and institutions to improve dissemination of emergency warnings and information.
- Encourage participation in the Community Disaster Preparedness workshops and other training sponsored by the Chemung-Schuyler Chapter of the American Red Cross.
- Make the Town of Elmira Hazard Mitigation Action Plan available to the public at municipal offices, public libraries, and online.
- Integrate the educational outreach efforts of the Town’s stormwater management program (required by the Town’s MS4 Stormwater permit) with public outreach about other hazards.

Goal: Provide emergency services in a timely and effective manner.

Objectives:

- Review the Town of Elmira Emergency Response Plan annually to verify that it is current and consistent with the Chemung County Comprehensive Emergency Plan.
- Provide municipal officials with periodic training in the Incident Command System and the operations procedures specified in the Emergency Response Plan.
- Periodically verify that the equipment identified in the Town Emergency Response Plan is available and in good condition.
- Periodically test all emergency communication equipment; upgrade as appropriate.
- Identify local animal hospitals, kennels, and other places where pets and farm animals can be housed during an evacuation.
- Periodically verify that there are current emergency response plans in effect for schools, prisons, nursing homes, emergency health care facilities, the airport, and businesses that handle hazardous materials. Provide any needed technical assistance to ensure that each plan is adequate and consistent with municipal and county plans.
- Maintain communication among highway departments to enable coordinated maintenance of emergency transportation routes.
- Periodically meet with the safety officer of each school and daycare center to review the Safe Schools Against Violence in Education (S.A.V.E.) plan or emergency plan and verify consistency with municipal emergency operations.

Goal: Maintain the viability of all critical facilities and operations.

A critical facility is any facility that is an integral part of emergency response operations or one that requires special emergency response due to the potential at the site for triggering an additional hazardous incident. A list of Critical Facilities and Operations Serving the Town of Elmira is included in Attachment A.
Objectives:
• Periodically review and update the list of critical facilities serving the Town.
• Develop and implement a program to ensure that all critical facilities are able to provide essential services during a power outage.
• Ensure that the operator of each critical facility conducts a structural evaluation, assesses the facility’s vulnerability to hazard events, recommends mitigation measures, and identifies safety zones within the structure (areas that offer the greatest protection from roof failure, broken glass, flying debris, etc.). Provide technical assistance as needed.
• Develop and implement strategies to mitigate identified risks to critical facilities.
• Periodically review and update the emergency operation plans for critical facilities.

Goal: Maintain political support for hazard mitigation and emergency response.

Objectives:
• Review contents of the Town of Elmira Emergency Response Plan with the Town Board each time that the plan is updated.
• Invite municipal elected officials to meetings of the Town of Elmira Hazard Mitigation Planning Committee, which monitors implementation of this Hazard Mitigation Action Plan and oversees its periodic revision (at least every 5 years).
• Review contents of the Town of Elmira Hazard Mitigation Action Plan with the Town Board and Planning Board each time that the plan is updated.
• Provide hazard mitigation and response training for municipal board members.

Goal: Establish and maintain partnerships between public and private sectors.

Objectives:
• Maintain and expand public/private sector coordination through organizations that are actively involved in hazard reduction activities (see table of Public/Private Organizations Involved in Hazard Mitigation and Response in Attachment A).
• Encourage leadership within public and private sector organizations to prioritize and implement hazard mitigation activities.

FLOOD/FLASH FLOOD

Goal: Raise public awareness about flood hazards, flood safety, and flood damage protection measures.

Objectives:
• Periodically disseminate flood hazard information to owners of flood-prone property and the general public. Topics should include information about flood-prone areas (including known locations of high water table), property owner responsibilities for streams, flood-proofing measures, flood insurance, and flood safety measures.
• Develop and implement a public outreach and education program about stream management, drainage, and stormwater issues in conformance with the requirements of the Municipal Separate Storm Sewer System (MS4) permit for urbanized areas and in cooperation with neighboring municipalities.

**Goal: Protect new development from flooding hazards.**

**Objectives:**
• Ensure that Code Enforcement Officer(s) receive periodic training and political support to effectively enforce existing floodplain development regulations.
• Improve flood hazard assessment information on which development standards are based.
• Evaluate the need to enact local floodplain development standards that are more stringent than the National Flood Insurance Program requirements.
• Evaluate mechanisms for insuring that basements of new buildings are elevated above known high water table levels.

**Goal: Protect new and existing development from streambank erosion.**

**Objectives:**
• Evaluate the effectiveness of local land use regulations in protecting private bridges and structures from erosion damage and protecting stream corridors from alterations that may result in increased erosion. Modify regulations as appropriate.
• Develop and implement a strategy for stabilizing stream channels in locations where bank erosion threatens development.

**Goal: Ensure that runoff from new construction and land use changes does not contribute to increased flood risks.**

**Objectives:**
• Implement an effective municipal stormwater management program in conformance with the requirements of the Municipal Separate Storm Sewer System (MS4) permit for urbanized areas and in cooperation with neighboring municipalities.
• Develop and implement a strategy for incorporating watershed planning and regional stormwater management practices into the Town’s stormwater management program.
• Develop and implement a strategy to minimize the drainage impacts of timber harvesting activities.

**Goal: Maintain streams, drainage ways, and drainage structures to minimize the potential for obstruction of flow.**

**Objectives:**
• Develop and implement a program for routine inspection and maintenance of streams, roadside ditches, and drainage ways in order to reduce the potential for flooding caused by debris obstructions.
• Develop and implement a strategy for maintenance of privately owned stormwater drainage systems.
• Formalize the drainage system maintenance program and document inspection activities in order to maintain National Flood Insurance Program Community Rating System Credit for these activities.

**Goal: Mitigate flood risks for existing development.**

**Objectives:**
• Develop and implement a strategy for maintaining and enhancing the natural hydrologic functions of stream/river channels, floodways, floodplains, and wetlands.
• Evaluate opportunities (and implement as appropriate) to alleviate flooding problems by retaining or retarding water upstream.
• Develop and implement a strategy for replacing undersized bridges and culverts on public roadways and on private property.
• Encourage/assist property owners with implementation of measures that will protect existing development from flood risks (elevation of utilities, sewer backup protection, flood-proofing measures, extension of municipal sewer and water, property buyouts, etc.).
• Promote flood insurance coverage for at-risk structures.
• Maintain and expand involvement in the National Flood Insurance Program Community Rating System Program so that properties in the Town receive a discount on flood insurance premiums.

**Goal: Provide timely and reliable warning of floods and flash floods.**

**Objectives:**
• Support maintenance and expansion of the flood warning capabilities of the Chemung Basin Flood Warning Service (operated by Environmental Emergency Services).
• Provide municipal officials and emergency response personnel with periodic training in the use of flood stage maps and other tools.

**HAZARDOUS MATERIALS (hazardous material released in transit, hazardous material released from a fixed site, petroleum spill, explosion, radiological release in transit)**

**Goal: Provide the public with information about how to respond appropriately to a hazardous material incident.**

**Objectives:**
• Periodically disseminate disaster education information in neighborhoods near major transportation routes, pipelines, and facilities that use or store hazardous materials, with particular emphasis on evacuation and shelter-in-place procedures.
Goal: Ensure quick and effective response by emergency response personnel to a hazardous material release or explosion.

Objectives:
- Ensure that first responders periodically obtain hazardous material training.
- Ensure that first responders periodically inventory their equipment and supplies for hazardous material response and make additional purchases as needed.
- Ensure that fire departments maintain up-to-date information about hazardous materials stored and used within their jurisdictions (209-U reports) and are familiar with the layout of these facilities. Additional effort may be required to maintain familiarity with agricultural operations, since they are exempt from hazardous material reporting requirements.
- Provide emergency responders with access to up-to-date information about hazardous substances and appropriate management techniques.
- Ensure that emergency and highway personnel periodically review procedures, detour routes, and equipment needs for traffic and crowd control.
- Ensure that hospitals have access to the medications and equipment needed to treat people exposed to hazardous materials.

Goal: Design and locate new development in such a manner as to minimize risks associated with the transport and use of hazardous materials.

Objectives:
- Periodically review the Town’s Comprehensive Plan and land use regulations (and revise as necessary) to verify that they promote development patterns in which major transportation routes and industrial facilities are located away from population centers, schools, gathering places, groundwater recharge areas, etc.
- When highway construction projects are in the design stage, ensure that emergency response personnel review draft plans to evaluate drainage, site access, and other conditions that might impact the dissemination of hazardous materials and the ability of emergency personnel to respond.

Goal: Utilize equipment, processes, and procedures that minimize the risk of explosion or exposure to hazardous substances at facilities that store and/or use hazardous materials.

Objectives:
- Encourage the owners of facilities that store and/or utilize hazardous materials to retrofit storage and operational facilities, as appropriate, to enhance safety.
- Assist facilities that store and/or use hazardous materials to periodically review and update each facility’s emergency operation plan.
TRANSPORTATION SAFETY (transportation accident, hazardous material released in transit)

Goal: Maintain and upgrade roads in a manner that promotes transportation safety.

Objectives:
• Ensure that highway departments monitor weather conditions and forecasts to enable timely response to snow, ice, and high water conditions.
• Ensure that highway departments periodically review and revise plowing schedules, high water inspection procedures, and road maintenance schedules to maximize roadway safety. High accident sites will be given priority for plowing and road maintenance.
• Ensure that highway departments periodically survey road lighting and approved traffic control devices (signs, markers, signals, etc.) and upgrade as needed.
• Ensure that transportation planners and highway departments use the information in the Crash Reporting System developed by the Elmira-Chemung Transportation Council to identify locations that might require an engineering improvement to prevent future accidents.
• When highway departments prepare budgets and schedules for road improvements, give priority to those projects that enhance safety by improving traffic patterns, road conditions, and signage.
• In conjunction with the Elmira-Chemung Transportation Council, evaluate potential applications of Intelligent Transportation System technology for improving traffic safety.
• Implement traffic calming techniques as “add-ons” to other road projects or as freestanding projects.

Goal: Promote transportation safety.

Objectives:
• In conjunction with the Chemung County Traffic Safety Board, raise public awareness about traffic safety issues by participating in outreach efforts and disseminating safety information.
• Provide municipal personnel with opportunities to participate in defensive driving training. In particular, school bus drivers, public transit drivers, snowplow drivers, and those who transport hazardous materials should be encouraged to participate.
• Utilize the GIS Crash Reporting System maintained by the Elmira-Chemung Transportation Council to target police enforcement efforts at high crash locations and times.

Goal: Design and locate new development projects to promote transportation safety.

Objectives:
• Periodically review the Town’s Comprehensive Plan and land use regulations (and revise as necessary) to verify that they promote development patterns in which major transportation routes and industrial facilities are located away from population centers, schools, and gathering places.
• Periodically review Town regulations (and revise as necessary) to verify that they promote proper access management on busy corridors and secondary roads. (By limiting the number
of driveway accesses, traffic flow is more predictable and therefore safer.)

- Promote greater use of context-sensitive design principles that harmonize the relationship between the road and nearby land use and incorporate traffic calming techniques.
- Encourage interconnection of subdivision roads in order to diffuse traffic patterns.
- Periodically provide transportation safety training for the Town Planning Board.
- Ensure that highway departments periodically review their standards for new roads and curb cuts to verify that they promote road safety.

**Goal:** *Ensure quick and effective response by emergency response personnel to a major transportation accident.*

**Objectives:**
- Develop comprehensive traffic management plan(s) for routine, special, and emergency traffic conditions.
- Establish intermunicipal/interagency agreements for traffic-related information sharing.
- In conjunction with the Elmira-Chemung Transportation Council, evaluate potential applications of Intelligent Transportation System technology for improving incident response.
- Ensure that emergency and highway personnel periodically review procedures, detour routes, and equipment needs for traffic and crowd control.
- Ensure that emergency personnel periodically evaluate the need for alternate access routes to areas that may become isolated if a bridge, railroad crossing, or other transportation route becomes blocked. If problem areas are identified, evaluate alternative solutions and seek funding for implementation.
- Periodically review and update the *Chemung County Offsite Air Disaster Response Plan*.
- Periodically review and update hospital disaster plans.
- The Chemung County Emergency Management Office maintains custody of the Southern Tier Regional Emergency Medical Service (STREMS) trailer, which is designed for response to mass casualty incidents.

**SEVERE WEATHER** (severe storm, severe winter storm, ice storm, tornado, extreme temperatures)

**Goal:** *Maintain trees appropriately in areas where broken branches can severely impact infrastructure and other development.*

**Objectives:**
- Maintain trees along municipal rights of way, as needed.
- Support/encourage utility companies to maintain trees near telephone and power lines.
- Periodically disseminate educational information about maintenance of trees adjacent to homes and other structures and recommended trees for urban landscaping.
- Prohibit planting of new trees between the sidewalk and road.
- Provide developers with guidance concerning the location of aboveground utilities in order to facilitate easy access by maintenance vehicles.
Goal: Bury utility cables so they are not susceptible to damage by wind and ice.

Objectives:
• Recommend and encourage the use of underground utilities in new developments, where feasible.
• Support/encourage electric utility companies to use underground construction methods wherever possible.

Goal: Raise public awareness about severe weather conditions and how to respond.

Objectives:
• Periodically disseminate disaster education information with guidance about how to obtain severe weather information, how to respond to severe weather conditions, how to shelter at home if that is necessary.
• Disseminate information prepared by the NY State Emergency Management Office and National Weather Service for “Severe Weather Awareness Week” in March and “Winter Weather Awareness Week” in October.
• Support maintenance and expansion of the early warning capabilities of the National Weather Service and Chemung Basin Flood Warning Service (operated by Environmental Emergency Services).
• Encourage greater utilization of NOAA Weather Radios by residents, businesses, and institutions to improve dissemination of severe weather watches, warnings, and advisories.
• Provide municipal personnel with opportunities to participate in defensive driving training, which includes information about how to respond to severe weather conditions. In particular, school bus drivers, public transit drivers, snowplow drivers, and those who transport hazardous materials should be encouraged to participate.

Goal: Require that buildings be designed to withstand high wind and heavy snow.

Objectives:
• Ensure that Code Enforcement Officer(s) receive periodic training and political support so that they can effectively enforce the structural standards in the New York State Building Code.
• Encourage structural inspection of older buildings that may not conform with the structural standards of the current New York State Building Code to identify potential vulnerabilities.
• Encourage implementation of preventive measures for existing development to reduce the vulnerability to severe weather damage.

Goal: Reopen transportation routes as quickly as possible following a severe weather event.

Objectives:
• Ensure that highway departments monitor weather conditions and forecasts to enable timely
response to snow, ice, and high water conditions.

- Ensure that highway departments periodically review and revise plowing schedules and hazardous weather response procedures to minimize the time required to restore safe roadways.
- Ensure that highway departments coordinate with emergency service providers to assist with the transportation necessary to provide emergency services.

**UTILITY FAILURE**

**Goal:** Maintain essential services and emergency operations during a utility failure.

**Objectives:**

- Evaluate the ability of each critical facility serving the Town to provide essential services in the absence of power, telephone service, natural gas, or municipal water.
- Develop and implement strategies to provide critical facilities with stationary or portable generators or to identify alternate procedures/locations that can be utilized in the event of a power outage.
- Verify that backup generators at critical facilities are periodically tested and maintained.
- Develop and implement strategies to provide critical facilities with radio equipment or other means of communication that do not rely on telephone service.
- Periodically test all emergency communication equipment.

**Goal:** Restore utility service as quickly as possible following an outage.

**Objectives:**

- Periodically verify that the Town of Elmira Emergency Response Plan has up-to-date utility contact information, so that the Town can assist with the dissemination of information and/or the restoration of service as appropriate.

**Goal:** Provide the public with information about what to do during an extended power outage.

**Objectives:**

- Periodically disseminate disaster education information with guidance about how to get information about a power outage and how to manage in the absence of electricity.
TERRORISM

Goal: Provide the public with information about potential terrorist threats and how to respond.

Objectives:
• Encourage residents, businesses and institutions to utilize NOAA weather radios, which can activate an alarm for civil emergency messages in addition to weather information.
• Educate residents about the Emergency Alert System, which utilizes radio and television to broadcast emergency messages.

Goal: Address terrorist threats in the operating policies of facilities that may be potential terrorist targets.

Objectives:
• Identify potential terrorist targets; develop target protection plans and public response plans.
• Ensure that public water suppliers prepare and periodically update vulnerability assessments (mandatory for all public water systems serving 3,300 or more persons).
• Ensure that public water suppliers prepare and periodically revise emergency response plans, which incorporate the findings of the vulnerability assessments (mandatory for all public water systems serving 3,300 or more persons).

Goal: Coordinate with county, state, federal, and international task forces and agencies that are preparing for or responding to terrorist threats.

Objectives:
• Assist the Regional Terrorism Task Force, when asked. This police task force facilitates information transfer between the federal, state, and local levels.
• Assist the Chemung County Emergency Management Office, when asked. The EMO is responsible for county level coordination of terrorism response.
• Develop emergency response plans for public water suppliers and other potential terrorist targets in coordination with emergency response agencies.

DAM FAILURE

Goal: Conduct routine inspections and maintenance of manmade dams.

Objectives:
• Conduct all prescribed maintenance on low, moderate, and high hazard dams.
• Local representatives and maintenance personnel shall participate in NYS Department of Environmental Conservation and Natural Resources Conservation Service inspection of dams.
• Maintenance personnel periodically inspect dams and report possible problems to dam safety
experts with the NYS Department of Environmental Conservation and/or Natural Resources Conservation Service.

**Goal:** Ensure that at risk areas are evacuated quickly when conditions exist for potential dam failure.

**Objectives:**
- Periodically review and update dam safety plans; evaluate alternatives for improving the effectiveness of warning and evacuation procedures.
- Periodically verify that dam failure inundation maps are readily available to municipal and emergency personnel.
- Periodically brief the Town Board, fire departments, and police departments on the locations of potential inundation areas and the contents of the dam safety plans.
- Periodically disseminate emergency preparedness information to properties within the dam failure inundation area.
- Conduct visual inspection of dams during high water events.
SECTION 6 – ACTION PLAN

In order to meet the goals and objectives identified in the previous section, the Town of Elmira recommends implementation of the following actions. These high priority mitigation actions were developed at a hazard mitigation planning committee meeting (held on May 22, 2003) and subsequently refined based on individual communications and review of draft documentation. The committee reviewed the mitigation strategy for this plan (Section 5) and identified projects that are needed to facilitate achievement of the goals and objectives. The committee also reviewed the mitigation actions recommended during previous flood mitigation planning efforts. This information was supplemented by a review of existing literature and discussions with local experts. The mitigation actions considered encompass a variety of approaches, including: prevention, property protection, public education/awareness, natural resource protection, emergency services, and structural projects. The committee focused on those mitigation actions that address the high priority hazards for the Town of Elmira (presented in Section 4) and contribute to achieving the goals and objectives in Section 5 of this plan. Alternative mitigation actions were evaluated, selected, and prioritized based on the following criteria:

- **Social:** Will the action be accepted and supported by the individuals who will be impacted and by the community at large?
- **Technical:** Is the action a technically feasible, long-term solution with minimal or no adverse secondary impacts?
- **Political:** Is the action supported by political leaders, local proponents (to help see the action to completion), and the public?
- **Legal:** Does the Town or County have the legal authority to implement the proposed action?
- **Economic:** Is the action a cost-effective means of providing hazard mitigation and community benefits?
- **Environmental:** Is the action consistent with community environmental goals?
- **Administrative:** Are the staff and funding available to implement and maintain the action?

**NOTE:** Inadequate resources did not preclude consideration of an action. Those actions that satisfy the first six criteria are recommended as high priority actions and are presented in this section. These are the measures that are recommended for implementation in the Town of Elmira in order to meet the goals and objectives identified in the previous section. Some of the proposed actions do not constitute a complete solution, but represent the portion of a desired action that can currently be implemented. The proposed actions that also fulfill the administrative criterion and can be implemented through existing municipal programs are listed separately from those for which additional funding is needed.

This action plan only includes those items that can be accomplished over the next several years by the Town of Elmira and the Chemung County Emergency Management Office. Fully achieving the goals and objectives set forth in this plan obviously necessitates additional activities in future years, as well as the active participation of additional partners.
MEASURES TO BE IMPLEMENTED THROUGH EXISTING PROGRAMS

The Town of Elmira is already implementing programs and enforcing regulations that achieve many of the mitigation objectives identified in this strategy. These hazard mitigation efforts will be maintained. Additional objectives can be met by incorporating additional hazard mitigation components into existing municipal operations and ongoing local programs. The following high priority activities utilize existing or anticipated local resources to mitigate hazards. Implementation of these measures would move the Town further toward its goal of being a disaster resistant community. The Town of Elmira plans to continue or initiate each of the following activities using existing or anticipated resources. However, it must be recognized that fiscal constraints limit the staff and financial resources that can be devoted to these activities and may delay or preclude full implementation of some of these proposed measures.

Multi-Hazard Mitigation – Public Information

Disseminate hazard information at Town Hall: At least once a year, the Code Enforcement Officer, Drainage Officer, and other Town personnel will review the brochures that are available in the Town Hall and evaluate the need for additional information about hazards, emergency preparedness, hazard mitigation, and stormwater management. Appropriate brochures will be procured and maintained on the display rack. The map of flood hazard and flood problem areas that is included in this plan will be displayed in the Town Building Department. A copy of the Town of Elmira Hazard Mitigation Action Plan will be available at the Town Hall.

Include hazard information in Town newsletter articles: The Town will continue to print articles about flooding and other hazards in the Elmira Town newsletter, Town Talk. This newsletter is published twice a year (spring and fall) and distributed to all property owners in the Town. Newsletter articles will inform residents about the measures they can take to prepare for disasters and mitigate the potential impacts.

Disseminate hazard information on the internet: As the Town of Elmira and Chemung County Emergency Management Office expand the scope of information available on the Town and County websites, additional information about hazards and emergency response will be incorporated directly or by linking to other sites. The Town of Elmira Hazard Mitigation Action Plan will be posted if possible. Additional topics will include hazard information, family disaster planning, emergency supplies, how to obtain current warnings, how to shelter-in-place, evacuation procedures, “good neighbor” policies, transportation safety, mitigation measures, etc.

Support education efforts: The Town of Elmira will continue to participate in and support County, regional, and state education efforts that address: natural hazards, flood mitigation, stormwater management, emergency preparedness, and related topics. The Town will continue to participate in the Chemung County Stormwater Coalition, Chemung County Water Quality Strategy Committee, and Chemung County Environmental Management Council. Outreach efforts to senior citizens can be coordinated through TRIAD, a coalition of senior citizen support organizations serving Chemung County.
Encourage greater utilization of NOAA weather radios: The National Weather Service uses the NOAA Weather Radio system to broadcast weather forecasts, flood forecasts, warnings, watches, other hazard information, and post-event information. In order to increase utilization of these emergency broadcasts, Environmental Emergency Services is planning a public information campaign and has initiated contacts with potential local business partners.

Multi-Hazard Mitigation – Emergency Services

Review and update Emergency Plan: The Town of Elmira Emergency Plan documents procedures that enable the Town to provide leadership and coordination during an emergency. This plan will be periodically reviewed and updated to insure that the information is current and accurate. At a minimum, contact information (for municipal officials, emergency personnel, utilities, etc.) will be updated annually. A complete review of the plan will be conducted every two years or after any event that triggers activation of the plan.

The Chemung County Emergency Management Office will be involved in this planning process in order to insure consistency with the Chemung County Comprehensive Emergency Plan. In addition, each fire department and police department that serves the Town will be asked to participate in the plan review process in order to insure their familiarity with the plan. Once revised, the contents of the Town Emergency Plan will be reviewed with the municipal elected officials and staff.

Issues that will be evaluated as part of the plan review process, include:

- Verify that the equipment identified in the Emergency Response Plan is available and in good condition.
- Test emergency communication equipment; upgrade as appropriate.
- Verify the availability of flood stage maps, which indicate areas expected to be inundated when Chemung River reaches different gauge levels.
- Review and update the list of critical facilities serving the Town.
- Evaluate each critical facility to identify potential vulnerabilities, such as structural problems, outdated emergency operation plan, lack of an identified safety zone within the structure (areas that offer the greatest protection from roof failure, broken glass, flying debris, etc.), inability to function during a power outage, etc. Develop a strategy that will mitigate or compensate for any identified risks to critical facilities.
- Contact the American Red Cross to confirm the adequacy of evacuation shelters, particularly for a regional event, such as a widespread power outage during cold weather.
- Identify local animal hospitals, kennels, and other places where pets and farm animals can be housed during an evacuation and enter into agreements with these facilities. Include a list of these resources in the plan.
- Assemble a list of key equipment that may be available from neighboring municipalities and the County to assist with municipal operations during an emergency. Include a list of these resources in the plan.
• Review and document procedures for highway departments to assist with the transportation needs of emergency service providers when the roads are not generally passable.

• Meet with the safety officer of each school and daycare center to review the school’s Safe Schools Against Violence in Education (S.A.V.E.) plan or emergency plan and verify consistency with the Town Emergency Response Plan. Schools and daycare facilities in the Town of Elmira include: Hendy Avenue School, Holy Family Intermediate School, First Presbyterian Church Preschool, and Lord’s Daycare.

• Contact key industries and businesses (nursing homes, health care facilities, businesses that handle hazardous materials, etc.) to verify that they have emergency response plans, that those plans are consistent with the Town Emergency Response Plan, and that up-to-date 209-U reports are on file with the fire department.

• Identify potential terrorist targets; develop target protection plans and public response plans.

• Meet with NYS Department of Transportation staff to review risk and response issues related to potential transportation accidents and hazardous material in transit incidents.

• Review Dam Safety Plans for dams located within the Town (and update if appropriate), to verify consistency with the Town Emergency Response Plan.

• Evaluate the need for alternate access routes to areas that may become isolated if a bridge, railroad crossing, or other transportation route becomes blocked.

Support Environmental Emergency Services, Inc.: Environmental Emergency Services, Inc. is a not-for-profit organization that utilizes volunteers to run the local Flood Warning Service and Chemical Hazard Information Team for Steuben and Chemung Counties. The Town of Elmira has historically contributed to the operating expenses of this organization. When the Town considers the annual request for funding from Environmental Emergency Services, they will request a presentation about the services provided, so that the Town Board can make an informed decision about the appropriate level of financial support.

Provide Chemung County Communication Center with locations of single access roads: The Code Enforcement Officer will provide the Chemung County Communication Center with a list of all single access roads in the Town of Elmira, so that they will be aware of the need to maintain an open lane during construction.

Multi-Hazard Mitigation – Preventive Measures

Periodically review and revise Comprehensive Plan and land use regulations: The Town of Elmira currently reviews the Town Comprehensive Plan and land use regulations annually or as needed. The following issues will be evaluated as part of this review process:

• Is the Town effectively promoting development patterns in which major transportation routes and industrial facilities are located away from population centers, schools, gathering places, groundwater recharge areas, etc.?

• Does the Town maintain predictable (and therefore safe) traffic flow by limiting the number and use of driveway accesses?

• Does the Town encourage the use of traffic calming treatments in roads and parking areas constructed for new development?
• Does the Town encourage interconnection of subdivision roads in order to diffuse traffic patterns and minimize single access roads?
• Do local regulations include adequate stream setbacks and standards to protect buildings and private bridges from damage due to streambank erosion?
• Do the Town’s floodplain development regulations (required by the National Flood Insurance Program) provide adequate flood protection for new development in areas with known flood risks? When updated digital Flood Insurance Rate Maps are available, the Town will consider the desirability of additional construction standards or regulation of additional areas not identified on the Flood Insurance Rate Maps.
• Do the stormwater management and erosion control standards provide adequate protection against increased flood damages? Prior to 2008, these regulations must be revised to meet the requirements of the Town’s MS4 stormwater permit. At that time, the Town will evaluate the desirability of additional measures, such as promotion of regional stormwater management.
• Do the stormwater management standards discourage the use of drywells in groundwater recharge areas and other sensitive locations?
• Is the process for reviewing driveways sufficient to insure that they are safe, allow emergency access to structures, and do not contribute to drainage problems?
• Are there urban and suburban areas where underground utilities should be required if feasible?

Provide hazard mitigation training for Planning Board members: The Code Enforcement Officer/Drainage Officer periodically briefs the Town Board and Town Planning Board about hazards that relate to site planning, transportation patterns, and development standards. Recent briefings have addressed stormwater management.

Flood/Flash Flood – Public Information

Utilize direct mailing to owners of flood-prone property: The Town of Elmira will continue to distribute flood information to owners of property in the 100-year floodplain as part of their Community Rating System outreach effort. Each year, the Code Enforcement Officer will review the information that is sent and the distribution list. Revisions will be made as appropriate. In addition, the Town will continue to mail information to the owners of property in specific problem areas whenever the need arises.

Flood/Flash Flood – Emergency Services

Expand network of volunteer rain gauge readers: The Town will continue to work with the Chemung County Emergency Management Office (EMO) to recruit volunteer rain gauge readers located around the Town and provide them with National Weather Service rain gauges. The need for an automated precipitation gauge in or near the Town of Elmira watersheds will be evaluated, particularly as additional detention and retention basins are constructed.
Flood/Flash Flood – Preventive Measures

Maintain and utilize database of flooding and drainage information: The Town will maintain site-specific flooding and drainage information to integrate with the Town’s land use planning and enforcement activities. This information will be available, upon request, to current property owners and to anyone intending to buy or build on a property. To the extent possible, this information will be accessible as digital data layers on the Town’s Geographic Information System (GIS) computer. This file will enable the Town to flag properties with known drainage considerations, which can then be targeted for outreach and assistance. This database will include:

1. regulated 100-year floodplain, 500-year floodplain (not regulated), and regulatory floodway (existing paper maps will be replaced by digital Flood Insurance Rate Maps when available),
2. properties known to have special drainage considerations or a history of flooding problems (not currently documented),
3. drainage infrastructure (storm sewer system has been digitized; additional documentation of drainage improvements and structures is desired), and
4. river stage forecast maps showing the areas of Elmira that will be inundated by specified river levels (not yet digitized).

Inspect and maintain drainage ways: Current staffing levels in the Town of Elmira limit the Town’s ability to implement the drainage way inspection and maintenance procedures specified in the Drainage System Maintenance Plan, Town of Elmira (December 1999). The Town will review and revise this plan so that it is consistent with the Town’s capabilities and will not infringe on private property rights. Implementation of the revised plan will improve the effectiveness of the Town’s inspection and maintenance activities and will enable the Town to resume Community Rating System credit for drainage system maintenance.

Participate in joint maintenance program for Old Chemung Canal: The Town of Elmira will continue to participate in a joint maintenance program for the Old Chemung Canal, in cooperation with Chemung County, the Town of Horseheads, the Village of Elmira Heights, and the City of Elmira. These partners have signed an agreement in which routine maintenance responsibilities are rotated among the participants. In addition, each partner contributes annually to an account that will pay for any restoration needs in excess of this routine maintenance. This program is administered by the Chemung County Soil and Water Conservation District and protects development along McCann’s Boulevard and Grand Central Avenue.

Identify funding sources for drainage and stormwater management programs: The Town of Elmira has until 2008 to develop and implement a stormwater management program consistent with the requirements of their MS4 permit. Some components of this stormwater program will require additional staff time and expertise to implement. Current staffing levels presently limit the Town’s ability to implement the drainage program that was developed following the 1994 and 1996 flooding events. In addition, the Town recognizes that the numerous drainage structures built in recent years require ongoing maintenance and are vulnerable to serious
damages from a major flood. The Town Board will evaluate available options for funding these drainage and stormwater programs. Possible mechanisms include: cost savings from coordination with neighboring municipalities, drainage district formation, grant funding, and utilization fees (modeled after Local Law No. 2 of the year 2000, “Local Law for Utilization of the Beecher Creek Detention Facility”). A drainage district encompassing most of the Town could provide a dedicated funding stream (outside of the general fund) for ongoing implementation of stormwater and drainage programs. In addition, a drainage district would enable the Town to qualify for Public Assistance funding for repairs to the drainage infrastructure necessitated by a federally declared flood disaster.

**Review potential for regional stormwater facilities:** The Town will continue its ongoing review of the needs and opportunities for regional stormwater management facilities that address existing stormwater problems and anticipated future development.

**Request updated Flood Insurance Rate Maps:** In order for the Town’s floodplain development regulations to effectively prevent flood damages, they must be based on accurate floodplain mapping. The Town of Elmira will write a letter to the Department of Environmental Conservation, Bureau of Flood Control (which is implementing map modernization efforts in New York) requesting that Chemung County be assigned a high priority for floodplain map modernization efforts.

**Flood/Flash Flood – Natural Resource Protection**

**Encourage establishment and maintenance of vegetated riparian buffers:** The Town will continue to support the establishment and maintenance of vegetated buffer strips along waterways. Funding assistance for establishment of riparian buffers is available through NRCS programs and other sources. In addition, the Town zoning requires a 50-foot stream setback for building construction. The Town Planning Board will consider increasing this setback to 100 feet in the next zoning ordinance revision.

**Implement stream stabilization projects:** The Town will continue to work cooperatively with the County Soil and Water Conservation District (SWCD) and property owners to implement projects that stabilize streams in west Elmira and on East Hill. Likely projects include drop structures and improvements to existing structures. The Town anticipates expenditures of about $30-40,000 annually from the Town Drainage budget for these projects. Projects constructed under the Town’s ½ - ½ program will be cost-shared by the Town and the property owner(s). This could enable implementation of about $60,000 to 80,000 worth of stream stabilization projects per year.

**Flood/Flash Flood – Property Protection**

**Organize a community sand bag program:** In response to a resident’s suggestion that the Town organize a “community sand bag program,” the Drainage Officer will evaluate the merit and
logistics of such a program. If appropriate, the Town will solicit volunteers and provide the necessary logistical support, coordination, and training.

Request early notification of floodplain property foreclosure: Acquisition and demolition of structures on flood prone property can permanently eliminate flooding problems and enable restoration of the natural beneficial functions of floodplain areas. An ideal time for implementing this policy is when the County has acquired flood prone property by foreclosure. Although the Town of Elmira is currently notified of all foreclosures within the municipality, the Town does not have sufficient time to evaluate the feasibility of acquiring the property. The Code Enforcement Officer will contact the County Emergency Management Director and Soil and Water Conservation District Manager to discuss the feasibility of recommending a County procedure for early notification of the municipality whenever a property in the regulated 100-year floodplain is acquired by foreclosure. This would enable the Town of Elmira to evaluate the feasibility of acquiring foreclosed properties and purchase such properties when appropriate.

Obtain information about land swaps to acquire flood-prone property: The Code Enforcement Officer will obtain information from counties that have acquired flood-prone property by exchanging property in other locations that was acquired through foreclosure. Information about these programs will be provided to the County Real Property Tax Director with a request that Chemung County evaluate the feasibility of establishing a similar program.

Assist property owners with floodproofing measures: The Code Enforcement Officer will continue to provide technical assistance for elevation of utilities and other measures for floodproofing existing structures. If property owners are interested in implementing flood protection measures that are beyond their financial means, the Town will evaluate the desirability of applying for financial assistance for floodproofing or property acquisition.

Upgrade existing drainage structures: When roads, ditches, and culverts are damaged due to drainage and flooding problems, the Town makes every effort to mitigate the problem when repairs are made. The Town Highway Department will continue the ongoing efforts to upgrade existing drainage structures as the need and funding permit.

Improve Community Rating System classification: The Town of Elmira is working to reduce the cost of flood insurance by improving their Community Rating System classification (which currently enables a 5% reduction in the cost of flood insurance). The feasibility of qualifying for an improved rating is evaluated during the annual re-certification process. If new credit activities are initiated or documented, a rating modification will be requested. The goal is to achieve and maintain a 10% reduction in flood insurance premiums for property owners. The reduced premiums will encourage the owners of flood-prone property to purchase and maintain adequate flood insurance coverage.
Flood/Flash Flood – Structural Solutions

Protect culvert entrances from blockage by debris: The Town has an ongoing program to protect pipe entrances from the accumulation of debris. The following projects are planned for implementation when staff resources and funding are available: (1) install an entrance structure for the unnamed drainage culvert under Pinewood Circle (Problem #33 in Attachment D) and (2) improve the pipe entrance area for Whirt’s Creek at Coleman Avenue (Problem #14 in Attachment D).

Hazardous Materials – Public Information

Implement radon testing and education program: The Chemung County Environmental Management Council will continue their ongoing radon testing program. Radon test kits are provided to the public at a discounted price. Test results obtained through this program are maintained in a database linked to map locations. Grant funding has been obtained to implement a radon education program that targets minority and low-income residents.

Hazardous Materials – Emergency Services

Provide hazardous material awareness training for Town Highway Department: Town Highway Department staff should receive periodic training in hazardous material awareness. The Chemung County Safety Coordinator/Emergency Planner will offer this training annually and invite participation from the Town Highway Department, fire departments, and the West Elmira Police Department.

Transportation Safety – Preventive Measures

Maintain communication with the NYS Department of Transportation: The Town of Elmira will actively seek to maintain good lines of communication with the NYS Department of Transportation during the planning, design, and implementation of any DOT projects within the Town. Town representatives and emergency response personnel will review draft plans to evaluate drainage, site access, and other conditions that might impact the dissemination of hazardous materials and the ability of emergency personnel to respond.

Provide municipal personnel with defensive driving training: Municipal staff who drive private or municipally owned vehicles as part of their jobs will be provided the opportunity to attend defensive driving classes taught by the Chemung County Safety Coordinator. The cost to the municipality is reduced by participation in the county training.

Dam Failure – Emergency Services

Prepare Dam Safety Plan for the Larchmont Road Detention Facility: Because the Larchmont Road Detention Facility is not classified as a high hazard structure, the New York State Department of Environmental Conservation did not require the Town of Elmira to prepare an
Emergency Action Plan for this structure. However, the Town considers it prudent to prepare an inundation map (delineating areas that could be inundated in an emergency situation) and a dam safety plan for this structure. The Town will request that the design engineer prepare an inundation map. The Chemung County Safety Coordinator/Emergency Planner will be asked to prepare a Dam Safety Plan.

Request Emergency Action Plan for Elmira Reformatory Dam: Because the Elmira Reformatory Dam is located upstream of populated areas in the Town and City of Elmira, it is classified as a high hazard structure for which an Emergency Action Plan is required. The structure is owned and maintained by the NYS Department of Corrections. Copies of the Emergency Action Plan and inundation map (delineating areas that could be inundated in an emergency situation) will be requested for the Town of Elmira and the Chemung County Emergency Management Office.

PROPOSED PROJECTS FOR WHICH ADDITIONAL RESOURCES ARE NEEDED

The following high priority actions are recommended for achieving the goals and objectives of this hazard mitigation plan, but cannot be accomplished with existing resources. These recommended projects require funding or other resources that are not currently available to the Town, but satisfy the other evaluation criteria. The Town of Elmira will seek funding to enable implementation of the following recommended actions. More accurate estimates of the potential dollar losses to vulnerable structures (included in the risk assessments in Section 4 and Attachment C of this plan) will be developed, as needed, to support funding requests.

Multi-Hazard Mitigation – Public Information

Develop community emergency training program: Develop a Citizen Corps Council program that utilizes American Red Cross training resources and volunteers to teach emergency awareness courses. Training will be based on the Red Cross “Preparing for Disasters” curriculum. It is anticipated that six training courses will be offered with 150 to 300 people from throughout Chemung County attending.

- Estimated cost: $4,100 for 6 courses (for manuals and travel expenses)
- Potential funding sources: Grant funding
- Project lead: Chemung-Schuyler Chapter of the American Red Cross
- Supporting partners: Chemung County Emergency Management Office, Retired Senior Volunteer Program of Chemung County (RSVP)
- Estimated timetable: Initiate an ongoing program when funding is available

Multi-Hazard Mitigation – Emergency Services

Provide emergency response training for municipal officials: The Town Supervisor, key municipal staff, and first responders should receive periodic training in the Incident Command System and emergency operations procedures. The Chemung County Emergency Management Office (EMO) will request that the NY State Emergency Management Office (SEMO) conduct
Incident Command System training for the Town of Elmira about every two years (provided by SEMO at no cost to the municipality). If funding and staff resources permit, the EMO will supplement this with a tabletop and/or functional exercise.

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<td>Supporting partners:</td>
<td>SEMO</td>
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<td>Estimated timetable:</td>
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Install repeater for Town Highway Department radio communication: Because of the geography of the Town of Elmira, Town Highway Department crews are sometimes unable to communicate with each other when they are out of their trucks. These communication difficulties have impaired emergency communication and coordination. In order to improve communication without replacing the existing radios, the Town is proposing installation of a repeater on East Hill.

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<tr>
<td>Estimated timetable:</td>
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Obtain generator for East Hill Highway Garage: At the present time, the East Hill Highway Garage does not have a source of backup power that can run fuel pumps and other essential equipment during a power outage. If the Department is unable to refuel vehicles in this part of the Town during an emergency, this could severely limit the Town’s ability to respond effectively. Although the West Elmira Highway Garage does have backup power, this is located a considerable distance from areas of the Town on East Hill. The Town proposes that a diesel generator be obtained for the East Hill Highway Garage.

<table>
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<tr>
<td>Estimated timetable:</td>
<td>When funding is available</td>
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Provide NOAA weather radios to public facilities: Conduct a survey of those locations at which public safety would be enhanced if they had NOAA weather radios with alarm functions to alert staff of severe weather or other emergency warnings (municipal buildings, public parks, schools, etc.). Each location that does not currently have this equipment will then be provided with a free radio or an opportunity to purchase one at a discounted price.

<table>
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<th>Estimated cost:</th>
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<td>Project lead:</td>
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<td>Estimated timetable:</td>
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Flood/Flash Flood – Public Information

Develop the public outreach and public involvement components of the Town’s stormwater management program: Two components of the stormwater management program that is being developed for the Town of Elmira (as required by the Town’s MS4 Stormwater permit) are: (1) public education and outreach and (2) public involvement and participation. This program will address both the water quality impacts of stormwater and the water quantity impacts as they relate to flooding and erosion damage. To the extent possible, these outreach and public involvement efforts will be integrated with additional hazard mitigation information (particularly flooding). Once the program is developed, it will be implemented on an ongoing basis.

- Estimated cost: To be determined
- Potential funding sources: To be determined
- Project lead: Chemung County Stormwater Coalition
- Supporting partners: Chemung County Environmental Management Council, Southern Tier Central Regional Planning and Development Board
- Estimated timetable: Ongoing program will be initiated when funding is available (no later than 2008)

Flood/Flash Flood – Preventive Measures

Expand database of flooding and drainage information: An improved database of flooding and drainage information would enhance the Town’s ability to effectively access drainage information concerning specific properties and to implement flood emergency operations. Where possible, this information should be compiled as a geo-referenced digital database that can be accessed using the Town’s Geographic Information System (GIS) computer. The information and digital data layers that will be assembled include:

1. Flood-prone properties: Records of past flooding events and the recollections of Town personnel will be used to assemble information about each property with a history of flooding and/or drainage problems. This information will be geo-referenced as a GIS data layer.
2. Drainage improvements and structures: The digitized map of the Town’s storm sewer system will be enhanced by incorporating additional information about drainage improvements and structures (photographs, specifications, maintenance requirements, easements, etc.)
3. River stage forecast maps: The existing paper maps will be digitized and added to the Town’s GIS data layers. This information will then used to assemble a database of individuals who will be impacted by flooding at each level. This will enable the Town to notify appropriate individuals when river flooding is predicted and will facilitate evacuation activities.
4. Historic flood information: Town staff, firefighters, and others will be interviewed to document the known information about the timing and sequence of flooding in recent high water events. This historic flood information will be used to prepare a summary of the sequence of flooding problems during a high water event and the time delay between
upstream and downstream peaks. This summary information will be used for emergency planning and for reference during future flood response efforts.

<table>
<thead>
<tr>
<th>Project Category</th>
<th>Estimated cost:</th>
<th>Potential funding sources:</th>
<th>Project lead:</th>
<th>Supporting partners:</th>
<th>Estimated timetable:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control stormwater and peak discharges on East Hill</td>
<td>To be determined</td>
<td>Town budget; grant</td>
<td>Code Enforcement Officer</td>
<td>SWCD, Chemung County Stormwater Coalition, Emergency Management Office</td>
<td>When funding is available</td>
</tr>
<tr>
<td>Develop and implement stormwater management program</td>
<td>To be determined</td>
<td>Grants, Town general fund</td>
<td>Code Enforcement Officer, Drainage Officier</td>
<td>Chemung County Stormwater Coalition, Chemung County Soil and Water Conservation District, Southern Tier Central Regional Planning and Development Board</td>
<td>Ongoing program will be expanded as funding permits (with full implementation no later than 2008)</td>
</tr>
</tbody>
</table>

Control stormwater and peak discharges on East Hill: The Town is concerned about the potential impact that future development of East Hill could have on existing drainage characteristics. In order to address existing problems and prevent adverse impacts from new development, the Town will evaluate the development potential, stormwater management requirements, and stream stabilization opportunities for the East Hill area. A hydrologic analysis of the Goldsmith Creek watershed will facilitate the evaluation of development alternatives and enable identification of appropriate sites for stormwater management facilities. A preliminary engineering review of the site upstream of the double pipes at Monkey Run Road indicated that the water volume that can be detained at that location is inadequate to solve the current downstream flooding and erosion problems, but may be desirable as part of the overall solution. The recommended stormwater management measures will be constructed as funding permits.

Collect LIDAR topographic data: The Chemung County Soil and Water Conservation District is seeking funding to collect LIDAR (Light Imaging Detection and Ranging) topographic data for
the entire county. This airborne laser technology enables development of a digital topographic data layer with one-foot contours. The collection of LIDAR topographic data for the Town of Southport has confirmed the high resolution of these data. The availability of LIDAR topographic data will facilitate the design of wetlands (for flood attenuation and other purposes) by reducing the expense of field surveying. The data will also be used for hydrologic modeling. It is anticipated that once LIIDAR topographic data are available, the NYS Department of Environmental Conservation will utilize this information to develop updated digital Flood Insurance Rate Maps for Chemung County. LIDAR topographic mapping and aerial photography can also be used to improve site planning and stormwater management.

**Estimated cost:** $242,000 for entire County; may reduce costs by coordinating with neighboring counties

**Potential funding sources:** Grant, municipalities, county

**Project lead:** SWCD Manager

**Supporting partners:** Upper Susquehanna Coalition, NYS DEC

**Estimated timetable:** When funding is available; data collection must be done when leaves are off the trees

### Hazardous Materials – Preventive Measures

Provide financial assistance for radon mitigation: In order to reduce the potential health risks associated with residential radon contamination, the Chemung County Environmental Management Council would like to supplement the ongoing radon testing and education program with financial assistance for mitigation measures. The program would provide funding to mitigate radon problems for low-income households where high levels of radon have been detected.

**Estimated cost:** To be determined (depends on scope of program)

**Potential funding sources:** To be determined

**Project lead:** Chemung County Environmental Management Council

**Supporting partners:**

**Estimated timetable:** When funding is available

Provide radon mitigation training: The Chemung County Environmental Management Council is seeking funding to conduct training about radon risks and mitigation techniques for municipal Code Enforcement Officers, real estate agents, mortgage lenders, and contractors.

**Estimated cost:** To be determined

**Potential funding sources:** To be determined

**Project lead:** Chemung County Environmental Management Council

**Supporting partners:**

**Estimated timetable:** When funding is available

### Groundwater Contamination – Public Information

Maintain Chemung County water testing program: Recent staffing cuts will result in elimination of the Chemung County Health Department’s private well testing program (because the County
This program has enabled County residents to obtain free testing of water samples and technical assistance for alleviating health risks from identified water quality problems. The Town of Elmira strongly supports the continuation of this beneficial program.

<table>
<thead>
<tr>
<th>Estimated cost:</th>
<th>$15,000 per year</th>
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<td>Project lead:</td>
<td>Chemung County Health Department.</td>
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<td>Supporting partners:</td>
<td>Chemung County Environmental Management Council, Chemung County Water Quality Coordinating Committee</td>
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<tr>
<td>Estimated timetable:</td>
<td>When funding is available</td>
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</table>
SECTION 7 – PLAN MAINTENANCE

The Town of Elmira intends to review and update this Hazard Mitigation Action Plan annually. (In order to maintain eligibility for state and federal grant funds, it must be updated at least every 5 years.) The Town Clerk will notify the Town Supervisor when it has been one year since the last review. The Supervisor will then delegate the responsibility of organizing a meeting to review and revise the plan. At a minimum, the following people will be asked to participate or send a representative:

- Town Supervisor
- Town Councilpersons
- Town Drainage Officer
- Highway Superintendent
- Code Enforcement Officer
- West Elmira Fire Chief
- West Elmira Police Chief
- Planning Board members
- Storm-Water Control Board members
- One or more citizens
- Chemung County Safety Coordinator/Emergency Planner
- Chemung County Director of Emergency Services
- Chemung County Hazard Mitigation Coordinator (Soil and Water Conservation District Manager)
- Regional Flood Mitigation Specialist (Southern Tier Central Regional Planning and Development Board)

The planning committee will solicit public input and comments each time this plan is revised. The media that can be used to encourage public involvement include the Town website, Town Talk newsletter, newspaper articles, posting notices in municipal offices, and directly contacting potentially interested individuals. Citizens will be encouraged to participate in the plan revision process by attending meetings and/or notifying municipal officials of their concerns and recommendations.

The Town of Elmira Planning Board will be asked to review each revision of the Town of Elmira Hazard Mitigation Action Plan prior to submission to the Town Board for adoption. This will insure consistency with other planning objectives and will provide Planning Board members with an opportunity to periodically consider the hazards faced by the Town and the opportunities for mitigating those hazards.

Each time the Town of Elmira Hazard Mitigation Action Plan is revised, the contents of the plan will be reviewed with the Town Board and municipal staff. Once all recommended changes are considered and incorporated, the Town Board will formally adopt the revised plan. The plan
revisions will then be incorporated into all copies of this document, including the plan posted on the Town website.
ATTACHMENT A

MAPS AND DATA

The attached materials include the following:

- Map: Current Land Use
- Table: Land Use
- Table: Town of Elmira Assets
- Table: Age of Residential Structures
- Table: Critical Facilities and Operations Serving the Town of Elmira
- Map: Critical Facilities
- Map: Transportation Infrastructure
- Map: Vulnerable Sites
- Map: Flood Hazards and Problems
- Table: Summary of Flooding Problems
- Table: Public/Private Organizations Involved in Hazard Mitigation and Response
- Map: West Elmira Dam Locations & Potential Flood Areas
## LAND USE
### TOWN OF ELMIRA

<table>
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<tr>
<th>Land Use</th>
<th>Acres</th>
<th>Percentage of Total</th>
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<tbody>
<tr>
<td>Agricultural (100's)</td>
<td>658</td>
<td>4.9%</td>
</tr>
<tr>
<td>Residential (200's)</td>
<td>6,626</td>
<td>49.3%</td>
</tr>
<tr>
<td>Vacant Land (300's)</td>
<td>3,989</td>
<td>29.7%</td>
</tr>
<tr>
<td>Commercial (400's)</td>
<td>139</td>
<td>1.0%</td>
</tr>
<tr>
<td>Recreation &amp; Entertainment (500's)</td>
<td>446</td>
<td>3.3%</td>
</tr>
<tr>
<td>Community Services (600's)</td>
<td>428</td>
<td>3.2%</td>
</tr>
<tr>
<td>Industrial (700's)</td>
<td>7</td>
<td>0.1%</td>
</tr>
<tr>
<td>Public Services (800's)</td>
<td>173</td>
<td>1.3%</td>
</tr>
<tr>
<td>Wild, Forested, Conservation Lands &amp; Public Parks (900's)</td>
<td>320</td>
<td>2.4%</td>
</tr>
<tr>
<td>Unknown</td>
<td>661</td>
<td>4.9%</td>
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<tr>
<td><strong>Total Acres</strong></td>
<td><strong>13,447</strong></td>
<td><strong>100.0%</strong></td>
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</table>

Source: 2003 Chemung County real property tax records
TOWN OF ELMIRA ASSETS
(based on assessed value and property class codes)

<table>
<thead>
<tr>
<th>Property Class</th>
<th>Number of Parcels</th>
<th>Cumulative Assessed Value* (all parcels in class)</th>
<th>Average Assessed Value*</th>
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<tr>
<td></td>
<td></td>
<td>Land</td>
<td>Buildings**</td>
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<tr>
<td>Agricultural (100's)</td>
<td>10</td>
<td>$256,765</td>
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<td>Residential (200's)</td>
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<td>483</td>
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<td>Commercial (400's)</td>
<td>55</td>
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<td>$132,699</td>
<td>$1,153,796</td>
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<td>Public Services (800's)</td>
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<td>$134,568</td>
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<td>Wild, Forested, Conservation Lands &amp; Public Parks (900's)</td>
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<td>$126,736</td>
<td>$36,935</td>
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<tr>
<td>Total</td>
<td>3,086</td>
<td>$56,918,595</td>
<td>$181,360,536</td>
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* 89% equalization rate applied
** building assessment is total assessment minus land assessment

Source: 2003 Chemung County real property tax records
### AGE OF RESIDENTIAL STRUCTURES
#### TOWN OF ELMIRA

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<thead>
<tr>
<th>Year Built</th>
<th>Number of Residences</th>
<th>Percent</th>
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<tr>
<td>2000-2003</td>
<td>18</td>
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<tr>
<td>1990-1999</td>
<td>102</td>
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<tr>
<td>1980-1989</td>
<td>95</td>
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<tr>
<td>1970-1979</td>
<td>348</td>
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<tr>
<td>1960-1969</td>
<td>434</td>
<td>11.0%</td>
</tr>
<tr>
<td>1950-1959</td>
<td>874</td>
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<tr>
<td>1940-1949</td>
<td>725</td>
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<tr>
<td>1930-1939</td>
<td>430</td>
<td>11.0%</td>
</tr>
<tr>
<td>1920-1929</td>
<td>389</td>
<td>10.0%</td>
</tr>
<tr>
<td>1910-1919</td>
<td>88</td>
<td>2.0%</td>
</tr>
<tr>
<td>1900-1909</td>
<td>123</td>
<td>3.0%</td>
</tr>
<tr>
<td>Before 1900</td>
<td>225</td>
<td>6.0%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>3,851</strong></td>
<td><strong>100.0%</strong></td>
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</tbody>
</table>

Source: 2003 Chemung County real property tax records
CRITICAL FACILITIES AND OPERATIONS
SERVING THE TOWN OF ELMIRA

A critical facility is any facility that is an integral part of emergency response operations or one that requires special emergency response due to the potential at the site for triggering an additional hazardous incident.

Town Hall (Primary Emergency Operations Center)

Alternate Emergency Operations Centers: East Hill Highway Garage, Town Voting Booth on McCanns Boulevard

Fire Departments: West Elmira Fire Department, West Hill Fire Department, Elmira Heights Fire Department, East Hill Volunteer Fire Department, Wellsburg Fire Department, mutual aid from neighboring fire departments

Police Departments: West Elmira Police Department, Chemung County Sheriff’s Office, New York State Police

Chemung County Emergency Management Office (located in the City of Elmira)

Chemung Basin Flood Warning Service (emergency operations center located in the City of Corning)

911-dispatch center (located in the City of Elmira)

Emergency medical and ambulance services: Erway Ambulance Service (based in the Town of Southport, with several satellite locations)

Hospitals: Arnot Ogden Medical Center (located in the City of Elmira), St. Joseph’s Hospital (located in the City of Elmira)

Highway Departments: West Elmira Town Highway Garage (located in the Town of Big Flats), East Hill Town Highway Garage, Chemung County Highway Department (located in the Village of Horseheads), NYS Department of Transportation (Regional Office in the City of Hornell, Steuben County; nearest maintenance garage is in the Town of Campbell, Steuben County)

Public schools/shelters: Hendy Avenue School

Utilities: Elmira Water Board facilities, Elmira Sewer District facilities, electric transmission system, telephone system, natural gas transmission system
Chemung-Schuyler Chapter of the American Red Cross (located in the City of Elmira)

**Broadcast media:** Radio Works (WCBA-AM, WCBA-FM, WENY-AM, WENY-FM, WCLI-AM, WGMM-FM; studio in City of Corning; broadcast towers in Town of Corning, Village of South Corning, City of Elmira, and Town of Ashland), Backyard Broadcasting (WPGI-FM, WINK-FM, WNGZ-FM, WGMF-AM, WWLZ-AM; studio in Village of Elmira Heights; broadcast tower in Town of Corning), WENY-TV (studio in Town of Horseheads; broadcast tower in Town of Big Flats), WETM-TV (studio in City of Elmira; broadcast tower in Town of Big Flats), WYDC-TV Big Fox (studio in City of Corning; broadcast towers in Town of Corning and Town of Horseheads), Time Warner Cable (located in Village of Horseheads), NOAA Weather Radio (from Binghamton, NY, National Weather Service office; Elmira transmitter in Town of Big Flats; Mount Washington transmitter in Town of Bath, Steuben County; Towanda transmitter in Bradford County, PA)

**Major transportation routes:** State Route 17 (future Interstate 86), State Route 352, State Route 14, State Route 225, Norfolk Southern railroad line, Elmira-Corning Regional Airport (located in the Town of Big Flats)

**Facilities with significant amounts of hazardous materials:** Five facilities in the Town of Elmira have hazardous material inventories that meet the reporting requirements for SARA Title III
Town of Elmira
Critical Facilities

Legend
- Schools
- Government
- Police/Fire
Town of Elmira
Flood Hazards and Problems

Legend

Riverine Flooding and Bank Erosion
Problems 1-29
Drainage Problems
Problems 30-43
Streams, Rivers, and Lakes
DEC Wetlands
100 Year Floodplain
500 Year Floodplain

Flood problems are described in "Flood Mitigation Action Plan Town of Elmira" (available at Elmira Town Hall).

Note: Floodplains and Wetlands data are approximate. Not for legal floodplain or wetland determination. Does not include changes past September 1996.

Source: Elmira Flood Mitigation Planning Committee
02 Flood data from Federal Emergency Management Agency
New York State Department of Environmental Conservation
### SUMMARY OF FLOODING PROBLEMS
#### TOWN OF ELMIRA

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<tr>
<td>1</td>
<td>Chemung River</td>
<td>Bank Erosion</td>
<td>Town of Elmira</td>
<td>4</td>
<td>x</td>
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<tr>
<td>2</td>
<td>Chemung River</td>
<td>Unprotected Floodplain in West Elmira</td>
<td>Town of Elmira</td>
<td>28</td>
<td>x</td>
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<tr>
<td>3</td>
<td>Chemung River</td>
<td>Area with Levee Protection</td>
<td>Town of Elmira</td>
<td>x</td>
<td>x</td>
<td></td>
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<td>4</td>
<td>Chemung River</td>
<td>Dam Failure</td>
<td>Town of Elmira</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>Diven Creek and McCann's Tributary</td>
<td>McCann's Boulevard and Grand Central Ave. Area</td>
<td>Town of Elmira</td>
<td>13</td>
<td>x</td>
<td></td>
<td></td>
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<td>6</td>
<td>Lower Goldsmith Creek</td>
<td>Jenkins Road</td>
<td>Town of Elmira</td>
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<td>x</td>
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<td></td>
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<td>7</td>
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<td>Greatsinger Road</td>
<td>Town of Elmira</td>
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<td>x</td>
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<tr>
<td>8</td>
<td>Baldwin Creek</td>
<td>Lowman Road</td>
<td>Town of Elmira</td>
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<td>x</td>
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<td>9</td>
<td>Baldwin Creek</td>
<td>Jenkins Road</td>
<td>Town of Elmira</td>
<td>1</td>
<td>x</td>
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### RIVERS AND STREAMS WITH MAPPED FLOOD PLAINS

### STREAMS WITHOUT MAPPED FLOODPLAINS

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<tr>
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<td>Clark's Glen Creek</td>
<td>Whitetail Drive</td>
<td>Town of Elmira</td>
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<td>x</td>
<td></td>
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<td>Clark's Glen Creek</td>
<td>Forest Hills</td>
<td>Town of Elmira</td>
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<td>12</td>
<td>Clark's Glen Creek</td>
<td>State Route 352</td>
<td>Town of Elmira</td>
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<tr>
<td>13</td>
<td>Whirl's Creek</td>
<td>Streambank Erosion</td>
<td>Town of Elmira</td>
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<td>x</td>
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<td>14</td>
<td>Whirl's Creek</td>
<td>Coleman Avenue</td>
<td>Town of Elmira</td>
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<td>15</td>
<td>Whirl's Creek</td>
<td>Proposed Development on Holly Road</td>
<td>Town of Elmira</td>
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<td>16</td>
<td>Beecher Creek</td>
<td>Streambank Erosion</td>
<td>Town of Elmira</td>
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<td>x</td>
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<td>Beecher Creek</td>
<td>Country Club Causeway</td>
<td>Town of Elmira</td>
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<td>Fern Dell Drive</td>
<td>Town of Elmira</td>
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<td>Glen Avenue and Adjacent Streets</td>
<td>Town of Elmira</td>
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<td>Beecher Creek</td>
<td>Pipes to the Chemung River</td>
<td>Town of Elmira</td>
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<td>x</td>
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<tr>
<td>21</td>
<td>Hoffmann Brook</td>
<td>Dam Failure</td>
<td>Town of Elmira</td>
<td>2</td>
<td>x</td>
<td></td>
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<td>22</td>
<td>Hoffmann Brook</td>
<td>Sunset Drive</td>
<td>Town of Elmira</td>
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<td>23</td>
<td>Heller Creek</td>
<td>Reformatory Dam</td>
<td>Town of Elmira</td>
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<td>Badger Creek</td>
<td>Watercure Hill Road</td>
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<td>x</td>
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<tr>
<td>25</td>
<td>Upper Goldsmith Creek</td>
<td>West Branch of Goldsmith Cr.</td>
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<td>26</td>
<td>Upper Goldsmith Creek</td>
<td>Monkey Run Road</td>
<td>Town of Elmira</td>
<td>2</td>
<td>x</td>
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<td>27</td>
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<td>Draht Hill Road</td>
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<td>28</td>
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<td>Jerusalem Road</td>
<td>Town of Elmira</td>
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<td>Upper Goldsmith Creek</td>
<td>Stiles Road Tributary to Goldsmith Creek</td>
<td>Town of Elmira</td>
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**RIVERS AND STREAMS WITH MAPPED FLOOD PLAINS**

**DRAINAGE AND PONDING PROBLEMS**

| 30 | Chemung River | Redfield Drive | Town of Elmira | 1 | | | | | |
| 31 | Chemung River | Church Street | Town of Elmira | x | x | | | | |
| 32 | Chemung River | West Elmira Underground Drainage System | Town of Elmira | x | x | | | | |
| 33 | Clark's Glen Creek | Pinwood Circle | Town of Elmira | 0 | x | | | | |
| 34 | Chemung River | Lone Pine Terrace & Hillbrook Rd. | Town of Elmira | 0 | | | | | |
| 35 | Chemung River | Upper Underwood Ave. | Town of Elmira | 0 | | | | | |
| 36 | Chemung River | Yunil Development and Long Meadow Drive | Town of Elmira | 3 | x | | | | |
| 37 | Hoffman Brook | Fassett Road Area | Town of Elmira | 0 | | | | | |
| 38 | Hoffman Brook | Upper Hillcrest Road | Town of Elmira | 0 | x | | | | |
| 39 | Hoffman Brook | Lower Hillcrest Road | Town of Elmira | 4 | x | | | | |
| 40 | Heller Creek | West Hill Road | Town of Elmira | 1 | | | | | |
| 41 | Goldsmith Creek | Monkey Run Road | Town of Elmira | 2 | x | | | | |
| 42 | Goldsmith Creek/Baldwin Creek | East Hill | Town of Elmira | 0 | x | | | | |
| 43 | Chemung River | Area Along State Highway 17 | Town of Elmira | 0 | x | | | | |

**SHALLOW WATER TABLE**

**FLOOD WARNING**

| 44 | All | Groundwater Flooding | Town of Elmira | x | | | | | |
| 45 | All | Flash Flooding | Town of Elmira | x | x | | | | |
| 46 | Newtown Creek/others | Stream Gauges | Town of Elmira | x | x | | | | |
| 47 | All | Rain Gauges | Town of Elmira | x | x | | | | |
## SUMMARY OF FLOODING PROBLEMS
**TOWN OF ELMIRA**

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<td>Stormwater Management</td>
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<td>x</td>
<td>x</td>
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<tr>
<td>50</td>
<td>Goldsmith Creek</td>
<td>Upper Goldsmith Creek</td>
<td>Town of Elmira</td>
<td>x</td>
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Elmira Flood Problems.....page 3
PUBLIC/Private ORGANIZATIONS INVOLVED IN HAZARD MITIGATION AND RESPONSE

American Red Cross, Chemung-Schuyler Chapter: A volunteer-led humanitarian organization that provides relief to victims of disasters and helps people prevent, prepare for, and respond to emergencies.

Environmental Emergency Services, Inc. (EES): A not-for-profit organization with the following mission statement: “To advise and inform the populace of Chemung and Steuben Counties in an effort to reduce the adverse effects of severe flooding, drought and hazardous material incidents which contribute to environmental emergencies.” The Board of Directors consists of members from Chemung and Steuben Counties as well as members from industry and other affiliated organizations.

Chemung Basin Flood Warning Service (FWS): A committee of EES with the following mission statement: “To collect pertinent rainfall, climate and river data and to use this information to assist Emergency Management Offices (EMO) in determining areas of concern for potential high water or drought problems in Chemung and Steuben Counties.”

Chemical Hazard Information Team (CHIT): A committee of EES with the following mission statement: “To provide chemical and safety information and guidance to local emergency responders in the event of hazardous material incidents.”

Chemung County Local Emergency Planning Committee (LEPC): A state-mandated committee of public and private sector representatives that meets quarterly to review hazardous material storage, transportation, and spill response issues. The committee is charged with creating and maintaining the Chemung County Hazardous Material Response Plan, which is updated annually.

Southern Tier Environment, Health, and Safety Group: Individuals from the public and private sector who meet monthly to discuss environmental, health, and safety issues and regulations, as well as preventive measures.

Chemung County Water Quality Strategy Committee: Representatives from municipalities, agencies, and organizations with involvement in water quality in Chemung County who meet monthly to coordinate and enhance the efforts of the respective groups. Hazard-related topics that have been addressed by the committee include: contamination of private wells, flooding, stormwater management, and drought.
ATTACHMENT B

PLANNING PROCESS DOCUMENTATION

The attached materials include the following:

• Newspaper announcement of public information meeting for the draft *Flood Mitigation Action Plan, Town of Elmira* that was held on January 28, 1999

• Handout summarizing the *Flood Mitigation Action Plan, Town of Elmira* that was distributed at the public information meeting

• Town of Elmira Resolution #190-99 adopting the *Flood Mitigation Action Plan, Town of Elmira*

• Town of Elmira Resolution #173-00 adopting revisions to the *Flood Mitigation Action Plan, Town of Elmira*

• Hazard mitigation planning information sheet that was posted in municipal offices during the hazard mitigation planning process

• Minutes of Elmira Town Board meeting on August 18, 2003, at which recent flooding problems were discussed and the Hazard Mitigation Public Meeting was announced.

• Notice of public information meeting for the draft *Town of Elmira Hazard Mitigation Action Plan* that was held on August 21, 2003

• Town of Elmira resolutions adopting the *Town of Elmira Hazard Mitigation Action Plan* and all subsequent revisions
TOWN OF ELMIRA

Officials will review draft flood plan

An informational meeting on the Town of Elmira's Draft Flood Mitigation Plan will be from 2:30 to 8:30 p.m. today at the town hall, 1235 W. Water St.

The meeting will include discussion of flood problems, projects designed to correct the problems, and programs needed to prevent future flooding situations.
Flood Mitigation Planning
Town of Elmira

The Town of Elmira Flood Mitigation Planning Committee has evaluated the community’s flooding problems and a variety of potential solutions in order to prepare a program of activities that the Town can undertake to tackle these problems.

WHY?

• Planning is a critical step toward coordinated implementation of activities that will reduce flood damages.
• Fulfill planning requirements for state or federal assistance programs (particularly the newly established Flood Mitigation Assistance Program).
• Qualify for Community Rating System credit toward reduced flood insurance premiums.

ASSESS THE FLOOD HAZARDS AND PROBLEMS

The Flood Mitigation Planning Committee identified and documented 53 flooding problems or potential flooding problems in the Town of Elmira. This documentation includes problems that have been addressed by the Town as well as those that still require resolution. A map indicating the locations of flood problem areas was prepared.

SET RISK REDUCTION GOALS

Long range goals for reducing future flood damages in the Town of Elmira were proposed. These goals emphasize preventive measures and maintenance of the Town’s drainage infrastructure.

ASSESS POSSIBLE MITIGATION MEASURES

Committee members attended a Flood Solutions Workshop at which they reviewed a comprehensive list of possible mitigation measures. They identified those solutions that are most applicable to the flooding problems and community needs in the Town of Elmira.

DEVELOP AN ACTION PLAN

The committee prepared an Action Plan, which describes 29 activities that the Town can implement with existing resources to address flooding problems. Each year this Plan will be reviewed and updated to incorporate the next steps that need to be taken to reach the community’s long term flood damage reduction goals.

REVIEW AND ADOPTION OF THE PLAN

The Planning Committee is now soliciting comments and input to the Draft Flood Mitigation Action Plan. Once local input has been incorporated, the Plan will be submitted to the State Emergency Management Office and Federal Emergency Management Agency for approval. It will then be presented to the Elmira Town Board for adoption. Adoption of this plan will qualify the Town for Community Rating System Credit (toward reduced Flood Insurance premiums) and Flood Mitigation Assistance grant funding.
Resolution #189-99
Set date for Annual Audit Meeting
By Mr. Sullivan
Seconded by Mrs. Rohde
Motion was made to set the date of January 18, 2000 at 7:00 P.M. for the annual audit meeting.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None

Resolution #190-99
Approve Flood Mitigation Plan
By Mr. Bush
Seconded by Mr. Sullivan
Resolved, that having reviewed the Flood Mitigation Action Plan for the Town of Elmira, that this plan is approved and accepted as the working policy for the Town.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None

Resolution #191-99
Approve Inspection and Maintenance System Maintenance Plan
By Mr. Sullivan
Seconded by Mr. Bush
Resolved, that having reviewed the Drainage System Maintenance Plan for the Town of Elmira, this plan is approved and accepted as the working policy for the Town.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None

Resolution #192-99
Transfer of Monies in Highway Dist.
By Mrs. Rohde
Seconded by Mr. Bush
Resolved that authorization is given to use fund balance to pay for a new 2000 International Dump Truck by decreasing DB909 Fund Balance by $29,779.35 and increasing appropriations account DB5130.2 by $29,779.35.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None

Resolution #193-99
Approve a contract with Hunt Engineers
By Mrs. Rohde
Seconded by Mr. Sullivan
Resolved, that the supervisor be authorized to sign the contract with Hunt Engineers, Architects & Land Surveyors, PC for Architect’s Services for the Capitalization Plan in the amount of $14,500 subject to approval with the Town Attorney.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None

Resolution #194-99
Set Workshop Date
By Mr. Bush
Seconded by Mr. Sullivan
Motion was made to set the date of January 21, 2000 at 8:30 A.M. for a workshop with Kirby, Beals & Maier.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None

Resolution #195-99
Set Workshop Date
By Mr. Bush
Seconded by Mrs. Rohde
Motion was made to set the date of January 14, 2000 at 8:30 A.M. for a workshop to discuss the Emergency Management Plan and the proposed Sub-Division Law.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None

Motion was made by Mr. Bush and seconded by Mr. Sullivan to adjourn at 10:10 A.M.

Ann Ridosh, Town Clerk
8-24-00
At the special workshop of the Town Board of the Town of Elmira, Chemung County, New York held November 28, 2000 at 8:00 A.M. at 1255 West Water Street, there were present:

Supervisor: Howard C. Lapple
Councilman: Kenneth Bush
Councilman: Joseph Prunier
Councilwoman: Isabelle Rohde
Councilman: David Sullivan-absent

Others present
Town Attorney- John V. Moore

Resolution #173-00
Approve amended Flood Mitigation Action Plan
By Mrs. Rohde
Seconded by Mr. Prunier
Resolved, that the amended Flood Mitigation Action Plan is approved and accepted as the working policy for the Town subject to review by the Town Attorney.
Aye- Bush, Prunier, Rohde, Lapple
No- None

Resolution #174-00
Set date for public hearing for Local Law #5-00
By Mrs. Rohde
Seconded by Mr. Prunier
Resolved, that a Public Hearing be held on Thursday, December 28, 2000 at 5:00 P.M. to consider Local Law #5-00 Prohibiting Littering and Dumping.
Aye- Bush, Prunier, Rohde, Lapple
No- None

On a motion by Mr. Bush and seconded by Mr. Prunier the meeting was adjourned at 9:25 A.M.

JoAnn Ridosh, Town Clerk
Hazard Mitigation Planning for the Town of Elmira

WHAT IS HAZARD MITIGATION PLANNING?

The Town of Elmira is susceptible to numerous hazards, including floods, hazardous material spills, tornadoes, and terrorism. Hazard mitigation is any action that reduces or eliminates the loss of life or property damage resulting from natural and human-caused hazards. In order to reduce the risks and potential damages from future disasters, the Town of Elmira is preparing a hazard mitigation plan. The objective of this planning process is to prevent damage from future disasters by anticipating where the damage will occur and identifying measures that will reduce the impacts.

WHY BOTHER?

• Planning leads to judicious selection of risk reduction actions. Hazard mitigation planning is the systematic process of learning about the hazards that can affect the community; setting clear goals; and identifying and implementing policies, programs, and actions that reduce the effects of losses from future disasters.
• Planning builds partnerships. Hazard mitigation planning enhances collaboration and mutual support among the parties whose interests might be affected by hazard losses.
• Planning contributes to sustainable communities. An essential characteristic of a sustainable community is its resilience to disasters.
• Planning establishes funding priorities. The hazard mitigation plan will save money by focusing efforts on hazard areas that pose the greatest risks and the mitigation measures that are both cost-effective and technically feasible.
• Planning qualifies the town for grant funding and reduced flood insurance premiums. Hazard mitigation planning is required to qualify for federal assistance programs that fund hazard mitigation projects. The hazard mitigation plan will also qualify for Community Rating System credit toward reduced flood insurance premiums.

WHAT IS INVOLVED?

• Organize resources. Establish a planning team of elected officials, public agencies, businesses, and citizens.
• Assess risks. Identify the characteristics and potential consequences of hazards.
• Develop a mitigation plan. Determine mitigation priorities, identify ways to avoid or minimize disaster-related losses, and develop an implementation strategy.
• Implement the plan and monitor progress. The plan comes to life when mitigation projects are implemented and operational changes are made. Periodic review will keep the plan current.

HOW CAN YOU PARTICIPATE?

Your collaboration and involvement will improve the planning process. Whether you want to join the planning committee or just share a few ideas, your input is welcome. Please talk to your municipal officials or call Janet Thigpen at 737-2096.
At the regular meeting of the Town Board of the Town of Elmira, Chemung County, New York held Monday, August 18, 2003 at 7:00 P.M. at 1255 West Water Street, there were present:

Supervisor: Howard C. Lapple
Councilman: Kenneth Bush
Councilman: Joseph Prunier
Councilwoman: Isabelle Rohde
Councilman: David Sullivan

Others present
Town Clerk- Jo Ann Ridosh
Town Attorney- Scott D. Moore-absent
Assessor- Theresa Murdock
Code Enforcement Officer- Gary M. Patclunas
Police Sergeant- Bruce Stayments
Acting Highway Superintendent- Matthew Mustico
Buildings & Grounds Caretaker- Chip LeValley

Resolution #121-03
Minutes
By Mrs. Rohde Seconded by Mr. Sullivan
Motion was made to approve the minutes of the regular meeting of July 21, 2003 and the special workshop meeting of August 11, 2003.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple No- None

Resolution #122-03
Transfers
By Mr. Bush Seconded by Mr. Sullivan
Resolved that the following transfers were herewith authorized:

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<tr>
<td>B1900.4</td>
<td>B3620.4</td>
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<tr>
<td>B5010.41</td>
<td>B5010.43</td>
<td>78.39</td>
<td>Under appropriated</td>
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Aye- Bush, Prunier, Rohde, Sullivan, Lapple No- None

Resolution #123-03
Financial Report
By Mr. Prunier Seconded by Mr. Bush
Motion was made to accept and file the Supervisor's report for the month of July 2003.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple No- None

Resolution #124-04
Audit
By Mr. Bush Seconded by Mr. Prunier
Resolved that claims #784 through #916 in the total amount of $241,321.04 were audited and approved for payment when in funds.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple No- None

Communications:
Mr. Robert Appleby, Gen. Mgr. Elmira Water Board, Re: Westmont Ave
Mrs. Gene Trestar, 497 Pinewoods Circle, Re: request town put up fence between town property and residential property
Pam Campbell, Elmira Country Club, Re: notification of intent to renew alcohol license for club

Department Reports:
Buildings and Grounds Caretaker Chip LeValley reported that the park and pool are doing fine and that the Tennis Court bids will be opened on Friday, August 21, 2003.
Sergeant Bruce Stayments reported that everything was quiet and the summer has been a good so far.
Acting Highway Superintendent Matt Mustico reported that the crews have finished Monkey
August 18, 2003

Run Road project and are still working on the new garage site and picking up debris from the first wind storm. The second storm had put the crews behind schedule. NYSEG is starting to work on the gas line for the West End garage site also.

Code Enforcement Officer Gary Patelunas reported that the certification for his State School has been approved and the town will be reimbursed 55% of the cost of the school and equipment that was purchased for the new state code requirements. To date one dumping permit has been issued for the storm damage program. Both detention ponds were inspected after the last heavy rainstorm. It was noted that debris needs to be removed from the ponds.

Assessor Theresa Murdock stated the final Equalization Rate has been released by the State. The rate is 89% which is down from 92.5% for last year. She has filed her roll for the 2003 Maintenance Aide and states that 2003 will probably be the last year we will receive that aide from the state. Theresa also has filed her Annual State Assessor Report. She stated her office is completing the process of entering the Social Security numbers for the Enhanced Star Applicants. October 31 is the deadline for this. This program from the State will cut down on the paperwork for filing Enhanced Star Applications.

Discussion:

Supervisor Lapple advised the Board that budget workshops will be scheduled soon to work on the 2004 Budget. It was suggested that Monday and Wednesday would be good days for these workshops.

There will be a Hazard Mitigation Public Information Meeting at the Town Hall on Thursday, August 21, 2003 at 5:00 P.M. This meeting will be presented by Janet Thigpen and Kristen Card of the Emergency Management Office.

Privileges of the Floor:

Joseph Allegretto, 89 Morningside Drive, Elmira, NY presented the board with a letter and petition which requests and supports the Town to construct a walking/running path behind the Town Hall. Over 226 signatures were obtained on this petition and he stated he will be submitting more.

William Hakes, 323 Lovell Avenue, Elmira, NY stated his road is very dusty from the storm cleanup and requested that it be cleaned up. He requested that instead of the town repairing Lovell Ave., that they replace it. Patching is only temporary he stated. Mr. Hakes also requested that curbing be added to the street. He stated the current curb is not high enough to protect heavy rain waters.

Gordon Burke, 1731 Genesee Road, is concerned with the drainage of his road. The road contours and the diversion ditch across the street came down with the storm. Drainage pipes under various driveways are now non-existent. So water now comes across road and into yards. Now there is a puddle of water that is standing water and he is afraid mosquitos will now hatch there. With that the worry of West Nile Virus. There is a ditch that does not work and he requested that the town repair that and put back drainage pipes back under the driveways.

Pat Burke, 1731 Genesee Road requested that the ditch be cleaned out of debris and tree limbs and remove the standing water. She feels if the ditch was cleaned out then the water would flow out.

John Goldman, 525 Pinewoods Circle, his creek bed that runs adjacent to his property was washed pretty much out with the rain water. The water cut a new path through his yard and down the street into neighbors yard. Questioned what has changed to cause the water to make that path instead of going through the original creek. Too much water at one time caused this to happen. He feels that the culvert that is there is not working. Mr. Lapple stated that Paul Kingsbury is away of this problem and the culvert will be repaired.

Walter Booth, 529 Pinewoods Circle, feels that a lot of the water is coming from the Town of Big Flats area and could the town regulate that somehow. The town is required to obtain easements before any work is done on private property.

Chad Uy, 41 Forrest Hills Drive, stated that water ran through other yards into his yard. He stated that his neighbor, Mr. Schmidt should clean out the pipe that is on his property and that would help the flow of water. Mr. Uy stated that the pipe is clogged and every time it rains other yards are flooded because of this clogged water pipe. What can he do to clear up this problem. Mr. Schmidt met with Paul Kingsbury and Gary Patelunas to discuss the clogged pipes. Another meeting will be arranged between the neighbors and Paul Kingsbury to solve this issue.
August 18, 2003

Steve Nugent, 356 Glen Avenue, stated they had white water rapids came right down the street and into his yard because of lack of curbs and ditches. Water had come up to their front door even though they had put out 2 x 4's to try and stop the flow. Their cellar was flooded. They had surface water from the water table being so high. Asked what this was called, was it a flood, surface water or what. Code Enforcement Officer stated that there is sump pump insurance that can be purchased if you have a continuous sump pump installed. Cost is probably about $30 a year. Call National Flood Insurance Program. Mr. Nugent feels that curbs would help the flow of water from running into residents yards. His neighbor has a retaining wall, is that allowed? He also suggested the Town create a Community Sand Bag Program for times such as these when sand bags would have helped. He also asked if a study will be done on the drainage ponds for the future.

Walter Booth asked whether the area was declared a disaster area or State of Emergency. Mr. Lapple stated we are awaiting word from the Governor and the President. They have to declare the area a disaster for monies or grants to be allocated.

David Clowisly, 758 Larchmont Road, thanked the Town and Highway Department for all the work that was done on the detention pond. It helped tremendously this time to keep the water from going in his house. He thanked Mr. Lapple for coming up on the night of the storm and making sure the area was safe. Also thanked the Highway Department for clearing out the drains.

Resolution 125-03
Authorize Town Supervisor to accept conveyance of property on Coleman Avenue from County of Chemung
By Mr. Bush  Seconded by Mr. Sullivan
WHEREAS, on August 18, 2003, the Town Board of the Town of Elmira convened at a regularly scheduled public meeting held at 1255 W. Water St., Elmira, NY at 7:00 P.M. to discuss the purchase of real estate located on Coleman Avenue, Tax Map #88.114-1-7.1 for the purpose of mitigating drainage and erosion problems and other topics and;
WHEREAS, the above described property is currently on Chemung County’s Tax Foreclosure list and the Town of Elmira is permitted by statute to purchase said parcel from the County for one dollar and;
WHEREAS, the Town Board has determined that it would be in the Town’s best interest to purchase this property so the Town can control the drainage and erosion occurring on this property;
NOW THEREFORE BE IT RESOLVED, that the Town Board of the Town of Elmira hereby authorizes the Town Supervisor to make the necessary arrangements with Chemung County for the County to convey the property to the Town as permitted by law for nominal consideration and to execute all necessary documents to obtain the title to the property located on Coleman Avenue, Town of Elmira, County of Chemung, State of New York and identified by Tax Map #88.14-1-7.1.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None

Resolution #126-03
Authorize Refund to Kathy Booth for Diving Lessons
By Mrs. Rohde  Seconded by Mr. Bush
Resolved, that Kathy Booth of 1401 W. Water St., Elmira, NY be refunded the fee of $40 for diving lessons that had to be rescheduled by the Town and then conflicted with her schedule.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No-None

Resolution #127-03
Authorize Refund to Jeanie Tomkalski for Diving Lessons
By Mr. Sullivan  Seconded by Mr. Prunier
Resolved, that Jeanie Tomkalski of 950 W. First St., Elmira, NY be refunded the fee of $20 for diving lessons that had to be rescheduled by the Town and then conflicted with her schedule.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None
August 18, 2003

Resolution #128-03
Accept resignation of Highway Superintendent John Shirley
By Mr. Sullivan Seconded by Mr. Bush
Motion was made to accept with regrets and appreciation the resignation of John Shirley from his position as Highway Superintendent effective August 26, 2003.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None

Resolution #129-03
Accept resignation of Ashley Henyan as diving instructor
By Mrs. Rohde Seconded by Mr. Prunier
Motion was made to accept the resignation of Ashley Henyan as Diving Instructor effective August 1, 2003.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None

Resolution #130-03
Appoint Steve Clack as diving instructor
By Mr. Sullivan Seconded by Mr. Bush
Resolved that Steve Clack of 58 Yellow Rock Lane, Horseheads, NY be appointed to Diving Instructor effective August 4, 2003 for the remainder of the 2003 program.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None

Resolution #131-03
Appoint Corey Ripley to Highway Department
By Mr. Bush Seconded by Mr. Sullivan
Resolved that Corey Ripley of 1809 W. Water Street, Elmira, NY be appoint to the position of Laborer in the Highway Department at a rate of $11.00 per hour effective August 11, 2003.
Aye- Bush, Prunier, Rohde, Sullivan, Lapple
No- None

On a motion by Mr. Bush and seconded by Mr. Sullivan the board went into an executive session to conduct personnel interviews at 8:02 P.M.

On a motion by Mr. Prunier and seconded by Mr. Sullivan the board went out of an executive session at 9:00 P.M.

On a motion by Mr. Bush and seconded by Mrs. Rohde the meeting was adjourned at 9:00 P.M.

Jo Ann Ridosh, Town Clerk
PUBLIC INFORMATION MEETING

TOWN OF ELMIRA
HAZARD MITIGATION ACTION PLAN

The Town of Elmira is sponsoring a public information meeting to solicit input on the draft Town of Elmira Hazard Mitigation Action Plan. This plan will serve as a guide for reducing the losses from future hazard events. It includes an assessment of the local risks from natural and man-made hazards and presents the Town’s strategy for pre-disaster implementation of projects that will minimize the damage to property and potential loss of life.

The public information meeting is scheduled for:

Thursday, August 21, 5:00 p.m.
Elmira Town Hall
1255 W. Water Street, Elmira

Copies of the draft plan are available for review at municipal offices, as well as at the public information meeting.

FOR MORE INFORMATION CONTACT: Janet Thigpen, Flood Mitigation Specialist, Southern Tier Central Regional Planning and Development Board, 737-5271
Resolution #112-05

Approve Hazard Mitigation Plan for the Town

By Mr. Bush  
Seconded by Mr. Prunier

Motion was made to approve the Hazard Mitigation Plan for the Town of Elmira for 2005 as a working policy for the Town subject to review by the Town Attorney.

Aye- Bush, Prunier, Sullivan, Milliken, Lapple  
No- None

On a motion by Mr. Bush and seconded by Mr. Prunier the workshop was adjourned at 5:40 P.M.

[Signature]

To Ann Ridosh, Town Clerk
Resolution #170-05
Amend Resolution #112-05 to Adopt Mitigation Plan
By Mr. Sullivan
Resolved that resolution #112-05 be amended to read: Motion was made to Adopt the Hazard Mitigation Plan for the Town of Elmira for 2005 as the working policy for the Town.
Aye- Bush, Prunier, Sullivan, Milliken, Lapple

Seconded by Mr. Bush
No- None
ATTACHMENT C

ASSESSMENT OF LOW PRIORITY HAZARDS

The following assessment evaluates the risks associated with each hazard that was given a moderately low or low priority ranking for the Town of Elmira. The hazards are presented in order of priority, followed by a list of the hazards that are not applicable to the Town of Elmira.

#8. TERRORISM

Definition: The threat or use of violence to achieve political/social ends usually associated with community disruption and/or multiple injuries or deaths.

HAZNY analysis:
- Scope: Several individual locations are vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: Less than one day of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers Little or no physical and/or economic damage to private property Little or no structural damage to community infrastructure

Past hazard events: Chemung County has no history of terrorist incidents.
- Past threats of school violence in Chemung County have included bomb threats and a student who took weapons to a high school in February 2001. The motivations for these threats were such that they are not considered to be terrorist incidents.
- In 1998, a bomb threat was made to a New York State office building in the City of Elmira. The motivation for this threat is not known.
- Following anthrax poisoning in 2001, the nation experienced copycat mailing of white powder and widespread paranoia. Although this did not result in any actual terrorist incidents in Chemung County, it necessitated emergency response to about 50 concerns.

Probability of future events: Chemung County does not have attractive targets for politically motivated terrorist attacks. Computer viruses or hacking can cause damages, but are unlikely to disrupt essential services. The most likely terrorist incidents to impact the Town of Elmira are either threats or attacks that actually occur elsewhere. The September 11, 2001 terrorist attacks have had emotional and economic impacts on the local community. Likewise, local concerns following the anthrax poisonings in 2001 necessitated repeated emergency response.
Potential impact: A terrorist incident in the Town of Elmira could have significant human costs, with community-wide impacts. Terrorists often seek to maximize destruction, so their intent may very well be to trigger other hazards, such as air/water contamination, utility failure, civil unrest, fire, hazardous material release, structural collapse, or explosion. Computer viruses or hackers could cause significant disruptions and economic losses, but would not prevent critical government operations or emergency services.

Vulnerable areas: Terrorist attacks or civil unrest can occur anywhere, but are most likely to target government buildings, places of assembly, symbolic landmarks, and locations with controversial occupancies. The Critical Facilities and Vulnerable Sites maps in Attachment A show the locations of schools, government buildings, emergency response facilities, and religious meeting places. The only two synagogues in the County and a Jewish Community Center are located in the Town of Elmira. Both synagogues have security systems.

Estimate of potential losses: Consideration of a credible worst-case terrorist incident for the Town of Elmira was influenced by the airplane that crashed in Somerset County, Pennsylvania on September 11, 2001. Although this terrorist attack was not targeted at Somerset County, the local consequences were significant. If a similar incident were to result in an airplane crash in the urbanized portion of the Town of Elmira, it could result in many deaths and millions of dollars in damages and emergency expenses. The highest assessed value for a single property in the Town of Elmira is $5,918,400. A credible terrorist attack could destroy this structure and surrounding properties.

#9. EXPLOSION

Definition: The threat or actual detonation of an explosive device or material with the potential of inflicting serious injury to people or damage to property.

HAZNY analysis:
- Scope: Small region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: Three days to one week of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  - Moderate physical and/or economic damage to private property
  - Moderate structural damage to community infrastructure

Past hazard events: A number of explosions have occurred in Chemung County.
- During the 1972 Hurricane Agnes Flood, natural gas was released from a damaged pipeline in the hamlet of Big Flats.
- In the late 1980’s, a pipeline explosion damaged a house in the Town of Big Flats.
• An explosion resulting from a natural gas leak destroyed the building of a small business in the Village of Wellsburg. The only person on the premises at the time was thrown from the building, but was not seriously injured.

• A natural gas leak in Horseheads caused an explosion that completely destroyed a building.

• An explosion at Kennedy Valve, in the City of Elmira, caused one death.

• In February 2001, a student took homemade bombs and other weapons to Southside High School. Fortunately, the situation was identified and resolved without any violence.

• There have been numerous instances in Chemung County involving the discovery of explosive materials, which were removed prior to any explosion. Several cases have involved old unstable munitions, which had been brought home by war veterans and kept in their residences. One case involved a number of pipe bombs. Another situation involved a civil defense fallout shelter with stored ether, which becomes picric acid (an explosive substance), with time. Picric acid was also discovered at a business located in the Village of Elmira Heights and Town of Elmira. Some farmers have old dynamite, which becomes unstable when it crystallizes.

• Chemung and Tioga Counties have the highest concentration of identified methamphetamine labs in New York State. From January 31, 1999 to January 31, 2004, 17 meth labs were found in Chemung County. These illegal drug-manufacturing operations utilize explosive substances.

**Probability of future events:** Although the threat of an explosion occurs much more often than the actual detonation of an explosive device, this is not an uncommon in the Town of Elmira.

**Potential impact:** An explosion generally occurs with little or no warning. It can cause serious injury or death to those in the immediate vicinity of the explosion and damage to the surrounding property. If it occurs in a building, that structure is likely to be extensively damaged or destroyed. An explosion can trigger a fire, transportation accident, hazardous material release, or other event.

**Vulnerable areas:** The types of situations that can lead to an explosion are so numerous, that most areas in the town must be considered vulnerable. Explosive materials can be stored and used at industrial sites, retail establishments, agricultural operations, mines, residences, and illegal methamphetamine labs. Explosive materials are transported through the Town on roads, railroads, and pipelines (see Transportation Infrastructure map in Attachment A). Propane trucks and natural gas distribution lines deliver explosive materials to customers throughout the Town. A terrorist could also detonate an explosive device.

**Estimate of potential losses:** The possibility of injury from an explosion is high and death is possible. One or more buildings can be completely destroyed. The highest assessed property in the Town is assessed at $5,918,400. A major explosion at this facility could cause damages approaching a million dollars.
#10. PETROLEUM SPILL

**Definition:** The uncontrolled or accidental discharge of petroleum into water and/or onto land or sea.

**HAZNY analysis:**
- **Scope:** Small region is vulnerable
- **Cascade effects:** Some potential to trigger another hazard
- **Frequency:** Frequent event (occurs more than once a year)
- **Onset:** No warning
- **Hazard duration:** Less than one day
- **Incident stabilization:** Less than one day of overtime emergency operations
- **Potential impact:**
  - Serious injury or death is unlikely
  - Little or no physical and/or economic damage to private property
  - Little or no structural damage to community infrastructure

**Past hazard events:** Approximately 95% of the spill events that require response by the NYS Department of Environmental Conservation involve petroleum products. Most of these incidents involve leaking underground storage tanks or the release of fuel due to a motor vehicle crash. The DEC Spills Engineer estimates that he responds to an average of about 80 to 90 petroleum spill incidents a year in Chemung County.

- Over the years, the NYS Department of Environmental Conservation has responded to dozens of underground petroleum leaks from old storage tanks.
- In the 1990’s, a significant release of gasoline occurred when a leaking underground tank at a gas station in the Town of Southport was filled without prior inspection. This incident contaminated three private water wells and required installation of a vapor extraction system to ventilate one nearby home.
- During the November 1996 flood, erosion in Seeley Creek exposed a gasoline pipeline south of Webb Mills in the Town of Southport. This pipeline, carrying 750 gallons of gasoline per minute, was left exposed to possible rupture for about two months until it was replaced at a greater depth.
- In 2001, erosion in Seeley Creek exposed a pipeline in the Town of Southport that is used to transport various petroleum products (diesel fuel, fuel oil, gasoline, jet fuel, and kerosene). Because this erosion also threatened State Route 328, the NYS Department of Transportation restored and stabilized the site.
- In 1995, pipeline corrosion in the Town of Big Flats resulted in the release of a couple hundred thousand gallons of gasoline, diesel fuel, fuel oil, and kerosene. This leak is thought to have occurred for about 6 months before it was discovered. A few neighboring wells were impacted, necessitating well replacement or water treatment systems. This incident seriously impacted the value of neighboring properties. Bioremediation efforts are still underway. It is estimated that expenditures to date have exceeded $2 million.

**Probability of future events:** The Town of Elmira has a history of frequent petroleum spills. These releases can occur as the result of transportation crashes, from petroleum pipelines, or
from fixed sites. The sites that store and utilize petro-chemicals include industries, gas stations, and facilities that maintain fuel tanks (highway departments, farms, etc.).

Potential impact: The most frequent fixed site petroleum spill incidents responded to by Spills Engineers from the NYS Department of Environmental Conservation involve the releases from abandoned underground storage tanks. The cleanup costs for these incidents typically range from a minimum of $10,000 to $50,000 or more if groundwater is contaminated. The most frequent transit-related petroleum spills involve the release of fuel due to traffic accidents. A tractor trailer accident can result in a surface spill of 50 to 300 gallons of diesel oil, which requires a response from the NYS Department of Environmental Conservation (DEC) and contractor work to clean up the site. The typical cost for this type of incident is $2,500 to 10,000 (estimate from DEC Spills Engineer). Smaller releases can be managed by fire departments. Ruptured pipelines can release large volumes of material, particularly if the rupture is not detected. The resulting environmental contamination can take years and millions of dollars to clean up.

Vulnerable areas: The transportation routes through the Town and the areas that have historically been vulnerable to transportation accidents are shown on the Transportation Infrastructure map in Attachment A. Although a transportation accident resulting in a petroleum spill could occur on county and town roads, the probability of significant releases is greatest along the state highways (Routes 352 and 17), which carry more truck traffic. These principal transportation routes pass through heavily populated areas of the Town. Natural gas pipelines are also vulnerable. The erosive nature of the Town’s streams poses a threat to shallow pipelines in the valleys or at stream crossings. The Town contains numerous facilities that use, store, or sell petroleum products. Most of these sites are located in the urbanized areas of the town where population densities are also greatest. Most of the residents and businesses in the Town of Elmira are located within one mile of a major roadway or a facility that stores petroleum products.

Estimate of potential losses: Although the typical cost of a petroleum release is estimated to be a few thousand dollars, a credible worst-case incident can be much more severe. The incident at Griffith Oil in the Town of Big Flats represents a credible worst-case scenario for the release of petroleum products from a transmission pipeline. The remediation costs for this release have exceeded $2 million, with significant additional property value losses incurred by the surrounding landowners.

#11. WILDFIRE

Definition: An uncontrollable combustion of trees, brush, or grass involving a substantial land area that may have the potential for threatening human life and property.

HAZNY analysis:
- Scope: Small region is vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
• Onset: No warning
• Hazard duration: Two to three days
• Incident stabilization: One to two days of overtime emergency operations
• Potential impact: Serious injury or death is unlikely
  Moderate physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: Chemung County has a history of wildfire, though the severity of such events has been significantly less than those in the western U.S. Local fire fighting crews are typically able to control these incidents before developed areas are threatened. On several occasions, sheds or other outbuildings have burned, but the overall structural losses from wildfires have been small.
• Two wildfires occurred in the Town of Big Flats in the 1990’s. One was the result of a downed power line. One took several days to subdue.
• In the late 1990’s, open burning led to a wildfire in the Town of Chemung that spread very quickly across hillsides. This occurred in April, when hot, dry weather occurred before vegetation started to grow.
• In 2000, open burning resulted in a large wildfire that burned over 100 acres of forest and approached park buildings at the Newtown Battlefield State Park in the Town of Elmira.
• In 2000, a downed power line ignited a wildfire that burned forestland on Mount Zoar in the Town of Southport.
• A fire occurred during the burnoff of a natural gas well in the Town of Big Flats, but was contained on the site.
• In March 2003, a brush fire occurred in the Town of Van Etten.

Probability of future events: Most wildfires are started by people through negligent behavior or by downed power lines. The risk of wildfire is greatest during drought conditions, when the moisture content of forests and grasslands is low. The National Weather Service uses the term fire weather for the meteorological conditions that promote the spread of fire. Those weather conditions that promote the ignition and rapid spread of fires include: low humidity, high winds (over 10-20 mph), dry thunderstorms (i.e., lightning without rain), unstable air, and dry antecedent conditions. Other factors that contribute to the spread and severity of fires include the available fuel, terrain (fire spreads faster uphill than downhill), and the urban-wildland interface. The ongoing spread of residential areas into forested parts of the Town means that the population faces a greater risk of forest fires. Many of the wooded areas in Elmira are thought to contain significant amounts of burnable material and have steep slopes that can promote the spread of fire.

Potential impact: Wildfires in Chemung County seldom burn more than a few acres before they are controlled. Development patterns in the Town of Elmira are such that a wildfire is not likely to impact a large number of structures. Most buildings in the rural and developed parts of the town are surrounded by lawns, which protect against the spread of fires from wooded areas. The use of asphalt shingles also protects against the spread of fire. All fires pose a risk to the firefighters who work to control the blaze. Heavy rains following a wildfire may induce
landsides, mudflows, and floods due to the inability of the burned areas to absorb water because of the absence of foliage and groundcover. In addition, fires may cause power failures, air contamination, hazardous material releases, structural collapse, or transportation accidents.

**Vulnerable areas:** The risk of wildfires is greatest in densely wooded areas with steep slopes. The densely wooded rural hillsides of Elmira contain scattered residential development, which is at risk from wildfires.

**Estimate of potential losses:** A credible worst-case wildfire in the Town of Elmira would be one that results in the complete loss of several rural structures. Due to the high cost of some rural development within the Town, this damage could approach a million dollars.

### #12. EARTHQUAKE

**Definition:** A sudden motion of the ground caused by release of subterranean strain energy, due to plate tectonics, resulting in surface faulting (ground rupture), ground shaking, or ground failure (collapse).

**HAZNY analysis:**
- **Scope:** Large region is vulnerable
- **Cascade effects:** Highly likely to trigger another hazard
- **Frequency:** Rare event (occurs less than once every fifty years)
- **Onset:** No warning
- **Hazard duration:** Less than one day
- **Incident stabilization:** More than two weeks of overtime emergency operations
- **Potential impact:** Serious injury or death is likely, but not in large numbers
  - Severe physical and/or economic damage to private property
  - Severe structural damage to community infrastructure

**Past hazard events:** There have been few recorded earthquakes in Chemung County. However, in February 2001, parts of neighboring Steuben County were rocked by a series of 4 earthquakes. These events had magnitudes ranging from 2.1 to 2.9 on the Richter scale and caused only minor damage.

**Probability of future events:** An earthquake can occur anywhere in New York State. In 1993, the New York State Earthquake Code Advisory Committee recommended seismic provisions for building codes, using Peak Ground Acceleration Values as a measure of the earthquake risk for each county in the state. The basis for their recommendations was an assessment of the earthquake risk in New York State. An earthquake with the Peak Ground Acceleration Value has a 10% probability of occurring over a 50-year period or a 100% probability over 500 years. For planning purposes it is believed to be the appropriate choice for a credible worst-case event. The Peak Ground Acceleration Value assigned to Chemung County is 0.09g for “average soil conditions.” This is the lowest earthquake risk in New York State and corresponds to a Richter
Scale earthquake magnitude somewhat greater than 5, for which damage would be slight. The ground acceleration of an earthquake can be amplified by unconsolidated soft soils, so the credible worst-case event in areas with glacial or alluvial deposits could be a magnitude 6 earthquake. (Analysis is based on “hazard expert” information for the NY State Emergency Management Office HAZNY program.) This risk assessment indicates that an earthquake of sufficient magnitude to activate emergency response operations is possible in Chemung County, but would be a rare event.

Potential impact: Earthquakes can damage buildings and infrastructure and disrupt utilities. In addition, an earthquake can trigger landslides, fire, flash floods, levee failure, dam failure, transportation accidents, and hazardous material releases. An earthquake measuring 6 on the Richter Scale (considered the worst credible event for Chemung County) is described as follows: “Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticeable when driving car.” Prior to January 2003, the New York State Building Code did not address seismic design. In the current building code, structures that represent a higher hazard to human life in the event of failure must meet minimum seismic requirements. Because Elmira is located in a seismically inactive area, the average building does not require any seismic provisions.

Vulnerable areas: Most buildings in the Town can be described as well-built ordinary structures, which could be subject to slight to moderate damage during an earthquake, particularly if they are located on unconsolidated soft soils. Older structures, particularly abandoned farm buildings, would be more vulnerable.

Estimate of potential losses: On April 20, 2002, a magnitude 5.3 earthquake struck six counties in northern New York. The most severely impacted areas were in Clinton County (federal disaster assistance of $1.5 million, corresponding to an average of $20 per resident or $1,506 per square mile) and Essex County (federal disaster assistance of $1.2 million, corresponding to an average of $30 per resident or $647 per square mile) (source: NY State Emergency Management Office). These figures underestimate the actual damage since not all losses qualify for federal disaster assistance. If a comparable event were to occur in the Town of Elmira, damages could be as high as $190,000 (based on per capita damages of $30).

#13. ICE JAM

Definition: Large accumulation of ice in rivers or streams interrupting the normal flow of water and often leading to flooding conditions and/or damage to structures.

HAZNY analysis:
- Scope: Several individual locations are vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
• Onset: Several days warning
• Hazard duration: Four days to one week
• Incident stabilization: More than two weeks of overtime emergency operations
• Potential impact: Serious injury or death is unlikely
  Severe physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: Two times in the 1990’s ice jams developed in the Chemung River near the west end of the flood protection levee, threatening development in the Town of Elmira. In both of these incidents, the ice broke loose before any flooding problems developed. These events raised concerns that rising water could flow behind the flood protection levee (which is not tied into high ground) and inundate areas that are generally protected by the levee, as well as unprotected areas mapped as 100-year floodplain. Localized ice jams occasionally develop on tributary streams in Chemung County. An ice jam in Bentley Creek has caused flooding in the Village of Wellsburg.

Probability of future events: Ice jam flooding can be expected to recur periodically along the Chemung River in the Town of Elmira and is also possible on streams.

Potential impact: An ice jam in a river or stream effectively forms a hanging dam that can block flow and cause water to back up. The flooding caused by an ice jam will persist until the ice breaks up, either naturally or as a result of human intervention. The resulting flood damages would be localized.

Vulnerable areas: In the reach of the Chemung River where ice jams have historically occurred, a significant amount of residential development (more than 100 houses) is at risk in the Town of Elmira. This area includes development within the 100-year floodplain west of the flood control levee and areas with levee protection that could be flooded if the severity of ponding causes inundation beyond the upstream end of the levee. Other areas along streams where debris jams have developed at bridges and culverts could experience similar flooding and erosion problems due to ice jams.

Estimate of potential losses: Ice jam flooding in the Town of Elmira can cause flooding of more than 100 homes in West Elmira, with potential damages of $1 million or more.

#14. TORNADO

Definition: A tornado is a violently rotating column of air that extends from the base of a thunderstorm and comes in contact with the ground. The vortex, up to several hundred yards wide, is visible to the observer as a whirlpool-like column of winds rotating about a hollow cavity or funnel. Tornadoes are the most violent storms on earth, with estimated wind speeds as high as 400 miles per hour.
HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Infrequent event (occurs once every eight to fifty years)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: Three days to one week of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Severe physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: National Weather Service records indicate that Chemung County has experienced one tornado in the past 20 years (1983 to 2002). In addition, there have been sightings of tornadoes that did not touch down and windstorms, which are classified as severe storms for this analysis. Tornado reports in neighboring counties over the same period include two in Steuben County, two in Schuyler County, two in Tompkins County, two in Tioga County (NY), and four in Bradford County (PA).

- The only confirmed tornado to have impacted Chemung County occurred on May 2, 1983. It was rated an F3 on the Fujita Scale, a potentially devastating storm (with wind speeds of 158 to 206 mph). The area damaged by this tornado was 300 yards wide and 6 miles long in the Town of Chemung. Even though this tornado hit a predominately rural area, it caused an estimated $2.5 million in property damage (source: National Weather Service).
- On May 31, 1985, as many as 41 tornadoes tracked across Ohio, Pennsylvania, and New York. Several of these tornadoes were rated at F4 or F5 strength (on the Fujita Scale, which ranks tornadoes from F0 to F5, with F5 being most severe). Damage from the event was estimated at 450 million dollars, with 75 people killed in the U.S. (source: National Weather Service).
- On May 31 and June 2, 1998, at least 20 tornadoes touched down in northeast Pennsylvania and central New York. Four of these tornadoes were rated F3, with estimated wind speeds in excess of 200 mph. Damage to homes was severe in two New York communities and power outages were reported across the state. 292 homes in Saratoga and Rensselaer Counties sustained damage, with private insurance covering losses on 90% of the damaged structures. The American Red Cross opened ten shelters, housing approximately 600 people, most in Saratoga County. Damages were estimated in the millions of dollars. This outbreak claimed two lives in Pennsylvania (sources: National Weather Service and the NY State Emergency Management Office Hazard Mitigation Strategy Report, FEMA-1222-DR-NY). Two funnel clouds associated with this storm system appeared over Chemung County, but did not touch down in the County.

Probability of future events: Contrary to a popular myth, hills and mountains offer no protection from tornadoes. New York State has an average of five tornadoes a year, which can occur in any region. Based on historic occurrences, Chemung County is expected to experience a tornado an average of once every 10 to 20 years. Because these events are localized, the frequency of occurrence in the Town of Elmira would be less.
Potential impact: Despite improved weather forecasting capability, tornadoes can occur with little or no warning. A tornado is a great threat to life and usually causes catastrophic damage to property within its path. The winds in the strongest tornadoes are the fastest winds experienced anywhere on earth, with rotation velocities up to 300 mph. They can result in the total destruction of homes (especially mobile homes), businesses, cars, etc. and cause many deaths. Extensive damage to electric and telephone lines is likely. Extensive tree damage along roadways may inhibit or block access. Damaged or destroyed radio and television towers can impede communication. Because tornadoes are associated with thunderstorms, they may be preceded or followed by heavy rainfall or hail. This violent path of destruction caused by a tornado is likely to result in serious injury or death and moderate to severe damage to public and/or private property. Tornadoes can trigger many other hazards, including power outages, structural collapse, fires, and hazardous chemical releases.

The design wind speed as set forth by the American Society of Civil Engineers (ASCE) for tornado safe rooms (shelters) in this region is 200 mph (source: Understanding Your Risks: Identifying Hazards and Estimating Losses, FEMA 386-2, August 2001). This standard is based on the extreme loads that can be generated by tornadoes, but is beyond the recommended building code requirements. The New York State Building Code requires construction for a design wind speed of 90 mph. Beginning in January 2003, the building code includes higher wind standards for structures that represent a higher hazard to human life in the event of failure. Buildings constructed in compliance with this code should be able to withstand lower intensity tornadoes, but may be unable to withstand the design wind speed recommended by the ASCE. The NY State Emergency Management Office reports that the vast majority of tornadoes are within the design speeds of building codes (85% have wind speeds of less than 112 miles per hour).

Vulnerable areas: The entire Town is vulnerable to tornado damage. Damage paths for tornadoes can be in excess of 1 mile wide and 50 miles long.

Following the 1998 tornadoes, building officials in Stillwater, NY observed that new and old construction was damaged equally. However, in Mechanicville, NY, building officials indicated that old construction seemed to fair better than new construction. Stone wall and concrete block foundations performed worse than poured concrete foundations. Houses with plywood sheathing held up better than those with cheaper materials, such as chipboard. Some strap braces failed. Many homes were punctured with flying debris. This was less of a problem with homes that had plywood sheathing rather than cheaper materials. Trusses in modular home construction were observed to have failed in the center at the gusset plate even though the remainder of the truss was intact. (Source: NY State Emergency Management Office Hazard Mitigation Strategy Report, FEMA-1222-DR-NY.)

The most severe damage from a tornado would be expected in mobile homes, farm buildings, and other structures that may not have been constructed to withstand high wind speeds. There are no mobile home parks in the Town of Elmira. The most dangerous locations are generally
large rooms with big expansive roofs. Rooms with large windows that may shatter are also extremely dangerous. Since designing buildings to extreme wind speeds is beyond the scope of current building codes, any development in the Town could be vulnerable to damage from even a moderate intensity tornado. A worst-case situation would be a tornado striking a gathering of people. The locations of schools, apartment buildings, and religious institutions are shown on the Critical Facilities and Vulnerable Sites maps in Attachment A.

Estimate of potential losses: Although a tornado can cause severe damage along its track, the damage is usually localized and does not impact the community at large. A tornado of any intensity can occur in the Town of Elmira, even the most devastating F5 category tornado (with wind speeds of 261 to 318 mph). Since wind speeds associated with tornadoes can be significantly higher than the design criteria in either recent or current building codes, it is anticipated that most buildings within the path of a credible worst-case tornado will sustain at least some damage. If this were to occur in a densely developed part of the Town, it could result in several deaths, numerous injuries, and millions of dollars in damages. The estimated damages from the devastating series of tornadoes in 1985 ($450 million of damage from 41 tornadoes in Ohio, Pennsylvania, and New York) corresponds to average losses of $11 million from each tornado. This is greater than the damages reported by NY SEMO for the 1998 events ($5 million in disaster assistance for multiple tornadoes), but the path of the most severe 1998 tornado avoided the most densely populated areas and disaster assistance does not cover all damages. Likewise the tornado that touched down in the Town of Chemung in 1983 (causing an estimated $2.5 million in property damage) impacted a predominantly rural area. A credible estimate of potential losses from a tornado in the Town of Elmira is thus estimated to be $11 million.

#15. TRANSPORTATION ACCIDENT

Definition: A mishap involving one or more conveyances on land, sea, and/or in the air that results in mass casualties and/or substantial loss of property.

HAZNY analysis:
- Scope: Large region is vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Infrequent event (occurs once every eight to fifty years)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death to large numbers
  - Moderate physical and/or economic damage to private property
  - Moderate structural damage to community infrastructure

Past hazard events: Although highway crashes with multiple casualties are relatively common, Chemung County has not experienced a major transportation accident resulting in large numbers of casualties. It has not been necessary to utilize the Southern Tier Regional Emergency Medical
Service (STREMS) mass casualty trailer in the last five years, except for training and standby status.

- A major train accident occurred in the Town of Southport in the late 50’s or early 60’s.
- In January 1988, a railroad derailment occurred behind Southside High School in the Town of Southport. No serious injuries occurred.
- In 1994, a busload of visitors heading for the Southport Correctional Facility went over an embankment on Highway 17 in the Town of Chemung. No serious injuries occurred.
- In Tioga County, Pennsylvania, a charter bus collided with a tractor trailer truck, resulting in a couple of casualties.
- A couple of school bus accidents have occurred in Chemung County in recent years. Although none of these incidents resulted in serious injuries, the emotional trauma is increased when a traffic accident involves school children.

Probability of future events: Crashes on the local roadways are common in the Town of Elmira. Because the community is transected by highways, secondary roads, railroad tracks, and flight paths, the potential for a major transportation accident must also be anticipated. Many hazards impact transportation systems and thus increase the probability of a serious accident. Contributing factors in traffic accidents include poor traction (due to snow, ice, rain, or spilled materials), limited visibility (due to rain, snow, fog, smoke, darkness, etc.), obstructions (such as downed trees or power lines), flooded or damaged roadways, etc.

Potential impact: A credible worst-case event in the Town of Elmira would be an accident involving a school bus. Potential cascade effects include: hazardous material spill, power, and explosion.

Several local organizations are actively involved in improving traffic safety in Chemung County and outage, fire reducing the probability of major transportation accidents. The Elmira-Chemung Transportation Council (ECTC) conducts planning efforts related to the safety of transportation systems throughout Chemung County. The Chemung County Traffic Safety Board promotes safety education for drivers, pedestrians, bicyclists and all users of the road and street system. A GIS Crash Reporting System has been developed and used for many purposes. Corrective measures that have been implemented at high crash locations include tree trimming and planned turn lanes. Local police departments are using the crash database to target enforcement activities.

Vulnerable areas: Since school buses transport children throughout the Town, most roads in the Town are considered to be vulnerable to a major transportation accident. The roads, railroads, and sites of past roadway crashes are shown on the Transportation Infrastructure map in Attachment A. All areas are also vulnerable to an airplane accident. Major air routes intersect over Chemung County, with numerous flight paths over the Town of Elmira.

Estimate of potential losses: A transportation accident involving a school bus, charter bus, or commercial airline could result in mass casualties. The Chemung County Emergency Management Office estimates that the financial losses from such an incident could be millions of
dollars. The highest assessed value for a single property in the Town of Elmira is $5,918,400. An airplane crash could destroy this structure and surrounding properties.

#16. HAZARDOUS MATERIAL RELEASED FROM A FIXED SITE

Definition: The uncontrolled release of material from a stationary facility, which when released can result in death or injury to people and/or damage to property and the environment through the material’s flammability, toxicity, corrosiveness, chemical instability and/or combustibility.

HAZNY analysis:
- **Scope:** Small region is vulnerable
- **Cascade effects:** Highly likely to trigger another hazard
- **Frequency:** Regular event (occurs once every one to seven years)
- **Onset:** No warning
- **Hazard duration:** Less than one day
- **Incident stabilization:** Less than one day of overtime emergency operations
- **Potential impact:** Serious injury or death is likely, but not in large numbers
  Moderate physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: Most hazardous material incidents at fixed facilities are successfully managed by onsite containment and ventilation systems and do not necessitate activation of emergency responders. The most frequent hazardous material releases from fixed sites involve petroleum products, which are addressed as a separate hazard. Fixed site releases involving other hazardous materials may necessitate response by the NYS Department of Environmental Conservation to a couple of incidents a year in Chemung County. Noteworthy incidents have included:
- An ammonia release from a fertilizer plant in the Town of Big Flats impacted neighbors, but dissipated before reaching the elementary school.
- A serious hazardous material spill occurred in the Town of Ashland (Chemung County) during the Hurricane Beryl flood in August of 1994. Illegally stored hazardous material bulk containers overturned and spilled their contents into the floodwaters. Most of the materials that were released were carried away by the floodwaters. The contamination stretched for several miles, contaminated homes and water supplies, and affected agricultural plants and animals. This incident exceeded the NYS Department of Environmental Conservation’s capabilities and required remediation efforts by the U. S. Environmental Protection Agency. The cleanup took many years, with estimated expenses exceeding $500,000 (emergency response, remediation expenses, testing, agricultural losses, etc.). None of these costs were recovered from the responsible party.
- In 1997, an aboveground storage tank at the Cutler-Hammer industrial facility in the Town of Horseheads burst at its seams, releasing approximately 30,000 gallons of sodium hydroxide solution. Fortunately, no one was near the tank when the spill occurred. The circumstances
of the spill were such that the material released offsite was diluted and the Horseheads Fire Department was able to neutralize the remainder.

- Chemung and Tioga Counties have the highest concentration of identified methamphetamine labs in New York State. From January 31, 1999 to January 31, 2004, 17 meth labs were found in Chemung County. These illegal drug-manufacturing operations utilize a number of hazardous substances. Although most drug lab discoveries were in rural areas, two recent busts occurred in the City of Elmira, where hazardous materials pose a risk to the civilian population, as well as to emergency responders.

- The American LaFrance/Remington Rand hazardous waste site is located adjacent to Southside High School in the Town of Southport. Remediation of the industrial facility included removal of several inches of soil and testing of school property. Cancer clusters among the school population have been alleged. An estimated $500,000 have been spent investigating potential contamination of the school grounds.

- Radon testing has identified high levels of naturally occurring radon in Chemung County.

**Probability of future events:** The sites from which releases of hazardous materials might occur include hazardous waste sites, industries, retail establishments (gas stations, auto supply stores, garden supply stores, hardware stores, etc.), agricultural operations, and illegal drug manufacturing sites. Five facilities in the Town report hazardous material inventories to the Chemung County Emergency Management Office under SARA Title III. Additional facilities file 209-U reports with the fire departments. The legal businesses and facilities that utilize or store hazardous materials are all believed to be in compliance with reporting and safety requirements, which minimize potential risks. Additional protection is provided by the Building Code of New York State, adopted January 2003, which sets higher standards for seismic, snow loading, and wind for structures that contain “sufficient quantities of toxic or explosive substances to be dangerous to the public if released.” However, the Town’s rural areas and abandoned farm buildings are potential sites for clandestine drug manufacturing operations, from which the probability of a hazardous material release is much higher than from legal operations. The disturbance of a brownfield site contaminated by improper disposal of hazardous materials could result in dangerous exposure to unknown contaminants.

**Potential impact:** Incidents involving hazardous materials may result in fire, explosion, release of toxic fumes, water supply contamination, or environmental contamination. If air or water disperses a hazardous material, the impacts can extend for miles from the site of the release. Hazardous material reporting requirements aid emergency responders in identifying the materials involved and responding appropriately. If hazardous materials cannot be cleaned up quickly they can be dispersed into the environment. The site could then become a superfund site (similar to those resulting from improper waste disposal), which typically involve years of cleanup activities and expenditures of a million dollars or more.

**Vulnerable areas:** The Chemung County Emergency Management Office has SARA Title III Emergency and Hazardous Chemical Inventory Reports on file for 5 facilities in the Town of Elmira. Additional facilities, such as automobile repair, contracting, and retail sites, are also likely to use, store, or sell hazardous materials (but do not meet the SARA Title III reporting
requirements). Most of these facilities are located in the urbanized areas of the town where population densities are also greatest. Additional risks occur on farms that use hazardous substances, but are exempt from the above reporting requirements. Unknown vulnerabilities occur in locations where illicit storage or use of hazardous materials occurs. Most of the residents and businesses in the Town of Elmira are located within one mile of a facility that handles hazardous substances.

Estimate of potential losses: The threat zone for an airborne chemical release from one of the Town’s industries includes the potential for severe contamination within about a mile of the facility in the downwind direction and an evacuation radius of 5 miles. The acute toxicity could preclude evacuation from some areas. The Town of Elmira population within five miles of a major industrial facility is 6,137 (85% of the Town’s residents). The estimated cost of sheltering these residents could exceed $150,000 (based on a Red Cross estimate that sheltering expenses are in the range of $25-100 per person per day). In addition to the human casualties, emergency response, and medical costs, property damage and environmental cleanup costs resulting from a hazardous material release can be hundreds of thousands, or even millions, of dollars. The cleanup costs associated with a flood induced hazardous material spill in the Town of Ashland in 1994 are estimated at $500,000. If this contamination had not been washed away by floodwaters, the DEC Spills Engineer estimates that the cleanup costs could have been $1 million or more. The assessed value of property within a two-mile sector downwind of an industrial facility in the Town of Elmira is $170,518,764. The release of a corrosive substance could necessitate cleanup and repair costs exceeding $4 million (based on an average expense of 10% of the assessed value within a sector extending one mile from the site in the worst-case wind direction).

#17. INFESTATION

Definition: An excessive population of insects, rodents, or other animals requiring control measures due to their potential to carry diseases, destroy crops, or harm the environment.

HAZNY analysis:
- **Scope:** Large region is vulnerable
- **Cascade effects:** Some potential to trigger another hazard
- **Frequency:** Regular event (occurs once every one to seven years)
- **Onset:** More than one week warning
- **Hazard duration:** More than one week
- **Incident stabilization:** One week to two weeks of overtime emergency operations
- **Potential impact:** Serious injury or death is unlikely
- Severe physical and/or economic damage to private property
- Little or no structural damage to community infrastructure

Past hazard events:
- Gypsy moths defoliated trees throughout the region in the early 1980’s.
• In the late 1990s mosquito problems developed on a wetland in the Town of Horseheads and were controlled with biological techniques.

• Deer populations have increased significantly in recent years. This has been accompanied by increased crop and foliage damage and significant numbers of motor vehicle accidents involving deer. Police reports for Chemung County in 2002 include 215 animal-car crashes and 254 collisions due to drivers’ actions to miss animals. The majority of these reported incidents involved deer. The actual number of incidents is probably significantly larger, since most deer-auto collisions are not reported to police.

• An article on the AAA website states that “each year there are about 500,000 deer/auto collisions resulting in more than 100 deaths and thousands of injuries.”

Probability of future events: As deer populations increase and more rural areas are developed, the problems caused by deer are becoming more prevalent. In addition to ongoing deer problems, other types of infestation occur occasionally.

Potential impact: High deer populations result in damage to crops, ornamental foliage, and forest resources. In particular, the value of timberland is threatened by the tendency for deer to eat the shoots and saplings of desirable species. The Chemung County Traffic Safety Board reports that deer are the primary cause of crashes in Chemung County. An infestation of mosquitoes or other disease-bearing animals can cause health concerns. Gypsy moth infestations damage forest resources.

Vulnerable areas: The areas of vulnerability depend on the type of infestation. Deer damage and deer-auto collisions are highest in rural parts of the Town. As deer populations increase, the resulting problems are encroaching into the suburban and even urban areas of the Town.

Estimate of potential losses: According to the Insurance Information Institute, each deer/auto collision costs the auto insurance industry about $2,000. The Chemung County police reports for 2002 attributed 269 collisions to animals (primarily deer). If these incidents were distributed evenly over the 412 square miles in the county, approximately 25 would have occurred in the Town of Elmira, costing the auto insurance industry approximately $50,000. Since many deer-auto collisions are not reported to police and many of the costs incurred are not covered by auto insurance, the expense of deer related collisions is estimated to be well over $50,000 per year and rising. In addition, deer cause severe damage to agricultural crops, forest resources, and landscaping.

#18. EPIDEMIC

Definition: The occurrence or outbreak of disease to an unusual number of individuals or proportion of the population, human or animal.

HAZNY analysis:
• Scope: Large region is vulnerable
Cascade effects: Highly likely to trigger another hazard
Frequency: Regular event (occurs once every one to seven years)
Onset: More than one week warning
Hazard duration: More than one week
Incident stabilization: Three days to one week of overtime emergency operations
Potential impact: Serious injury or death to large numbers
Little or no physical and/or economic damage to private property
Little or no structural damage to community infrastructure

Past hazard events: The Chemung County Health Department reports that a flu epidemic occurs every year. Most of the deaths resulting from these influenza outbreaks occur in the elderly population. Additional disease outbreaks in the last decade have included: repetitive outbreaks of rabies, increasing incidence of Hepatitis B, and two Hepatitis A incidents. West Nile virus was first detected in dead birds in Chemung County in 2000, but has not resulted in any known human cases in the county. Chronic wasting disease has impacted deer populations in other parts of the country, but there have been no reported cases in either New York or Pennsylvania. Historical events include the Swine Flu Scare in 1976 and the Hong Kong Flu in 1968. In 2003, severe acute respiratory syndrome (SARS) had severe impacts in other countries.

The U.S. Centers for Disease Control and Prevention (CDC) reports that in most years, influenza-related complications are responsible for 10,000-40,000 deaths, 50,000-300,000 hospitalizations and approximately $1-3 billion in direct costs for medical care in the United States. Flu pandemics have occurred in the United States in 1918, 1957, and 1968. Although death rates associated with the recent pandemics of 1957 and 1968 were confined primarily to the elderly and chronically ill, both pandemics were associated with high rates of illness and social disruption, with combined economic losses of approximately $32 billion (in 1995 dollars).

- The Spanish Influenza pandemic in 1918 is the catastrophe against which all modern pandemics are measured. It is estimated that approximately 20 to 40 percent of the worldwide population became ill and over 20 million people died. Between September 1918 and April 1919, approximately 500,000 deaths from the flu occurred in the U.S. alone. The attack rate and mortality was highest among adults 20 to 50 years old.
- Although the Asian influenza pandemic in 1957-58 was not as devastating as the Spanish Flu, about 69,800 people in the U.S. died. The elderly had the highest rates of death. The virus that caused this pandemic was quickly identifies and limited supplies of vaccine were available.
- The 1968 Hong Kong influenza pandemic was the mildest pandemic in the 20th century. The number of deaths between September 1968 and March 1969 was 33,800. The reasons cited for the lower death rate include: partial immunity due to similarities with the Asian flu virus, reduced transmission by school children due to school holidays, and improved medical care and antibiotics to treat those who became ill.

Probability of future events: Immunizations and sanitary practices have decreased the prevalence of what most people would classically think of as epidemics. However, the human population remains susceptible to influenza outbreaks, Hepatitis B, Hepatitis A, HIV, meningitis, or vector
borne diseases such as West Nile Encephalitis and Lyme Disease. In addition, rabies and other
diseases may affect the animal population (both wild and domestic). Recent concerns have
focused on the possible use of anthrax or another biological agent by terrorists. In response to
this threat, Chemung County is participating in national efforts regarding small pox vaccination.
Flooding could also trigger an epidemic, since floodwater can carry bacteria that are harmful to
both humans and animals.

Potential impact: Recent influenza outbreaks in other parts of the state have led to significant
increases in hospital admissions and emergency room visits, sometimes causing hospitals to
request that ambulances divert non-emergency patients to other hospitals. Less severe impacts
would occur if a lower proportion of the population contracts the disease. A disease that impacts
animals could have severe consequences on the affected farms.

Vulnerable areas: Although an epidemic could impact the entire population of Chemung County,
it is generally the young, old, and those with existing medical conditions who are at the greatest
risk. Depending on the disease, the mechanism of transmission can result in greater risks for
some segments of the population than for others.

Estimate of potential losses: The impact of the next pandemic could have a devastating effect on
the health and wellbeing of Elmira residents. The CDC estimates of the possible impact in the
United States are:

- Up to 200 million persons may be infected;
- Between 40 and 100 million persons may become clinically ill;
- Between 18 and 45 million persons may require outpatient care;
- Between 300,000 and 800,000 persons may be hospitalized;
- Between 88,000 and 300,000 persons may die.

Using the 2000 census data to scale the CDC estimates to the Town of Elmira, this worst-case
pandemic could have the following consequences:

- Up to 4,400 persons may be infected (71% of the population);
- Between 860 and 2,220 persons may become clinically ill (14 to 36% of the population);
- Between 370 and 990 persons may require outpatient care (6 to 16% of the population);
- Between 6 and 19 persons may be hospitalized (0.1 to 0.3% of the population);
- Between 2 and 7 persons may die (0.03 to 0.11% of the population).

The CDC estimates that the 1957 and 1968 pandemics had a combined economic loss in the U.S.
of approximately $32 billion (in 1995 dollars). Splitting these losses equally between the two
outbreaks and scaling this to the population of Elmira, the economic losses that could result from
a similar incident could exceed $350,000 in the Town of Elmira.
#19. STRUCTURAL COLLAPSE

**Definition:** A sudden structural failing, partially or fully, of buildings, bridges or tunnels, threatening human life and health.

**HAZNY analysis:**
- **Scope:** Large region is vulnerable
- **Cascade effects:** Some potential to trigger another hazard
- **Frequency:** Infrequent event (occurs once every eight to fifty years)
- **Onset:** No warning
- **Hazard duration:** Less than one day
- **Incident stabilization:** One to two days of overtime emergency operations
- **Potential impact:** Serious injury or death is likely, but not in large numbers
  - Moderate physical and/or economic damage to private property
  - Moderate structural damage to community infrastructure

**Past hazard events:** Chemung County has experienced several incidents involving partial or full collapse of structures.
- Farm buildings occasionally collapse. These are generally abandoned structures that are not in use and therefore cause minimal damage.
- There have been several incidents in which a motor vehicle hit a house and caused partial collapse of the structure. One such occurrence was in the Town of Horseheads in 1996, when a tractor-trailer collided with a house and shifted the building on its foundation.
- In 1976, three children playing in an old tobacco shed in the Town of Big Flats were hitting the structural supports of the shed with lumber. The building collapsed and one child was killed.
- In the 1990’s the wall of a commercial building in the City of Elmira collapsed during construction.
- Heavy snow in 1993 resulted in roof collapse of two agricultural buildings in the Town of Big Flats.
- There was a partial collapse of a commercial building in Elmira in 1998.
- Bridges have also collapsed due to erosion damage during flood events. The Pine Hills Drive Bridge over Bird Creek in the Town of Southport was completely destroyed during the August 1994 flood, eliminating all access to approximately 100 houses in the Pine Hills and Woodland Park areas. The Town installed a temporary bypass within 18 hours and subsequently replaced the bridge with a larger structure at a cost of $1,300,000.

**Probability of future events:** A structural collapse can be induced by a traffic accident, heavy snowfall, high winds/tornado, an earthquake, flooding, an explosion, or some other incident. The schools, churches, and other buildings where people gather in the Town of Elmira are well-built structures that are not considered vulnerable to collapse. The previous and current building codes set standards for structural loads. In addition, the current Building Code of New York State sets higher standards for seismic, snow loading, and wind for structures that represent a higher hazard to human life in the event of failure. The buildings with the greatest probability of
failure are abandoned structures and farm buildings. The probability of collapse when a building is occupied or while traffic is on a bridge is considered to be relatively low.

Potential impact: Although there may be warning of an event that can trigger a structural collapse, the collapse itself can occur with little or no warning time. The impact of a structural collapse depends on the type of structure impacted and the occupancy or use of the structure at the time of collapse. The collapse of an unused building in a remote area would have minimal impact. The collapse of an occupied gathering place (church, school, fire station, etc.) could cause serious injury or death to a number of people. The most credible event that the Town anticipates is the collapse of one or more residential buildings due to a traffic accident, heavy snow load, or other triggering event.

Vulnerable areas: Most buildings in the Town are reasonably well-built structures, which are unlikely to collapse unless they are subject to an extreme event, such as a tornado. Older buildings and mobile homes are more likely to be vulnerable than newer structures built in compliance with existing and recent building code standards. The most vulnerable structures are abandoned farm buildings.

Estimate of potential losses: The credible worst-case building collapse in the Town of Elmira would probably be limited to one older home or part of a larger structure. Injury of death could result; the financial loss is unlikely to exceed $50,000. The collapse of a public or privately owned bridge could result in greater losses. The cost of replacing a collapsed bridge on a public roadway can exceed $1 million.

#20. DAM FAILURE

Definition: Structural deterioration, either gradual or sudden, resulting in the facility’s inability to control impounded water, resulting in danger to people and/or property in the potential inundation area. Dams may be either man-made or exist because of natural phenomena, such as landslides or beavers.

HAZNY analysis:
- **Scope:** Large region is vulnerable
- **Cascade effects:** Highly likely to trigger another hazard
- **Frequency:** Rare event (occurs less than once every fifty years)
- **Onset:** Several hours warning
- **Hazard duration:** Less than one day
- **Incident stabilization:** More than two weeks of overtime emergency operations
- **Potential impact:** Serious injury or death is likely, but not in large numbers
  - Severe physical and/or economic damage to private property
  - Severe structural damage to community infrastructure
Past hazard events: Since 1890, there have been at least 41 dam failures in New York state, resulting in the loss of 10 lives. This number may not include failures of small structures, for which damages were minimal. The failure of beaver dams and un-maintained low hazard dams has occurred in surrounding communities. Because these structures are typically located in remote areas, significant damages have not generally occurred.

The Elmira Correctional Facility dam on Heller Creek in the Town of Elmira experienced seepage during a high water event in January 1998. No failure occurred. This structure has since been rebuilt.

Probability of future events: Dam failure can result from many factors such as natural disasters, structural deterioration, or actions caused by man, including terrorism. According to the International Commission of Large Dams (ICOLD), the three major causes of dam failure are overtopping by flood, foundation defects, and piping. Five earth fill dams are located above populated areas in the Town of Elmira: Hoffman Dam on Hoffman Brook, Elmira Water Board Dam on Hoffman Brook (located downstream of Hoffman Dam), Reformatory Dam on Heller Creek, Beecher Creek Detention Facility on Beecher Creek (located on Elmira Country Club property), and Larchmont Detention Facility on Whirt’s Creek (see the West Elmira Dam Locations & Potential Flood Areas map in Attachment A). Many of these structures are new dams, which have not yet been filled, so their integrity has not yet been tested. Four of these structures are classified as high hazard dams because they are upstream of developed areas. Inadequate design and maintenance of these man-made structures can result in seepage or overtopping, which may cause dam failure. A privately owned dam on Hillcrest Road is classified as a low hazard dam because the downstream development is minimal. Other dams exist because of natural phenomena, such as landslides or the work of beavers. Upstream of Elmira, the Chemung Basin contains five U.S. Army Corps of Engineers flood control dams. The Tioga, Hammond, and Cowanesque reservoirs are quite large and, if breached, could inundate large areas in the Chemung River Valley. However, the probability of such an occurrence is considered to be extremely remote.

Potential impact: In the event of a dam failure, the sudden release of enormous amounts of water would cause flash flooding downstream of the structure. The resulting water surge may be powerful enough to destroy another downstream dam, compounding the disaster. In the case of a high hazard dam, the area of inundation could include buildings and other development. An emergency plan has been prepared or is being prepared for each of these structures. The emergency plans for catastrophic releases of water from the Tioga, Hammond, and Cowanesque Dams in Pennsylvania indicate that such an event could inundate significant portions of the Town of Elmira. Arrival times would be about 11 hours or more after failure, which should be sufficient to prevent loss of life. However, the damage to private property and infrastructure could be extensive. The water surge can cause water supply failure, sewer system failure, hazardous material releases, power outages, and other cascade effects.

Vulnerable areas: The West Elmira Dam Locations & Potential Flood Areas map in Attachment A shows the locations of the NYS permitted dams in the Town of Elmira. This map also shows
the potential inundation areas resulting from failure of the high-risk structures on Hoffman Brook and Beecher Creek.

Estimate of potential losses: The failure of a high hazard dam in the Town of Elmira could cause loss of life and millions of dollars in damage to downstream development.

#21. **DROUGHT**

**Definition:** A prolonged period of limited precipitation affecting the supply and quality of water.

**HAZNY analysis:**
- **Scope:** Large region is vulnerable
- **Cascade effects:** Highly likely to trigger another hazard
- **Frequency:** Regular event (occurs once every one to seven years)
- **Onset:** More than one week warning
- **Hazard duration:** More than one week
- **Incident stabilization:** Less than one day of overtime emergency operations
- **Potential impact:** Serious injury or death is unlikely
  Severe physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

**Past hazard events:**
- Based on 100 years of Palmer Index values, the western plateau of New York (Allegany, Cattaraugus, Chemung, and Steuben Counties) has repeatedly experienced severe and extreme drought conditions. A “severe drought” classification (corresponding to the state drought stage of “emergency”) occurred about 5% of the time; an “extreme drought” classification (corresponding to the state drought stage of “disaster”) occurred about 2% of the time. The periods with a severe or extreme drought classification are listed below (source: “hazard expert” information for the NY State Emergency Management Office HAZNY program):
  - September 1895 – January 1896
  - August 1897 – July 1898 (except May 1898; extreme drought October – December 1897)
  - July 1899 – February 1901 (except March 1900; extreme drought June 1900; extreme drought August 1900 through February 1901)
  - October – December 1910
  - May & July 1911
  - June & October 1921
  - August – November 1923
  - October 1930 – June 1931 (extreme drought November 1930 – April 1931)
  - July 1934 – March 1935 (except September 1934)
  - September 1936
• In recent years, New York State has issued the following drought declarations for Chemung County (source: Susquehanna River Basin Commission):
  Drought Watch declared on October 13, 1995
  Drought Watch declared on June 23, 1999; Drought Warning declared on July 9, 1999;
   Drought Emergency declared on August 7, 1999; returned to normal on March 27, 2000
  Drought Watch declared on August 8, 2001; returned to normal on May 7, 2002
• During the 1999 drought, numerous private wells went dry. Public water supplies were not threatened.
• During the 2001 to 2002 drought, some private wells experienced problems.

Probability of future events: Even though New York normally possesses an adequate water supply with sufficient annual precipitation to replenish surface- and ground-water resources, the region is still susceptible to periods of drought. Approximately 65% of the Town’s residents are served by public water from the Elmira Water Board, which relies primarily on the Chemung River Aquifer. This is a reliable and abundant water supply even during dry periods. The Hoffman Reservoir serves as a backup water source. Additional protection is provided by interconnections with neighboring municipal water supplies (Big Flats and Horseheads). Drought conditions severe enough to impair the Elmira Water Board’s ability to provide water for essential uses are unlikely. However, droughts that impact private well supplies, agriculture, and wildfire risks are likely to occur, on the average, every 5 to 10 years (estimate is based on the 15 events in 100 years listed above).

Potential impact: Drought periods progress through stages and drought intensity may vary considerably during the drought period. The time of occurrence and duration can cause significant variations in drought impacts. The initial impact of a drought is likely to be felt by agriculture and by those relying on private wells. Agriculture faces major losses when adequate soil moisture cannot be maintained and when sufficient water is not available for livestock. If it becomes necessary to impose mandatory water use restrictions or import water, additional economic impacts will occur. Some businesses and industry may be affected by reduced revenues resulting from increasingly severe restrictions on nonessential water uses. Dry conditions increase the potential for water supply contamination. Parched lands are more susceptible to wildfires during a period of drought. Structural fires also present a problem if there is not sufficient water available for fire fighting needs or if the time required to transport the water is significantly increased. If dry conditions are so severe and widespread that the region is unable to obtain adequate potable water, a drought can cause serious threats to public health and sanitation. However, the NY State Emergency Management Office reports that the historical record lacks instances of serious injury or death due to drought conditions. Additional impacts can include wildlife mortality, loss of ornamental vegetation, and damage to fish and wildlife habitat.
Vulnerable areas: Private wells located outside of the river valley aquifers are most vulnerable to drought conditions. The ground in these upland areas stores less water and therefore requires more frequent recharging than the primary aquifer in the Chemung River Valley. Agricultural operations and landscaping are also at risk.

Estimate of potential losses: The potential costs associated with a severe drought include the cost of replacing private wells with deeper wells, agricultural damages, and industrial losses. Anchor Glass could incur losses in the hundreds of thousands of dollars if they are unable to maintain operations.

#22. AIR CONTAMINATION

Definition: Pollution caused by atmospheric conditions (as opposed to a chemical spill or release), such as a temperature inversion induced smoggy condition sufficiently serious to create some danger to human health.

HAZNY analysis:

- **Scope:** Large region is vulnerable
- **Cascade effects:** Unlikely to trigger another hazard
- **Frequency:** Regular event (occurs once every one to seven years)
- **Onset:** Several hours warning
- **Hazard duration:** Less than one day
- **Incident stabilization:** Less than one day of overtime emergency operations
- **Potential impact:** Serious injury or death is unlikely
  - Little or no physical and/or economic damage to private property
  - Little or no structural damage to community infrastructure

Past hazard events: Ozone alerts for Chemung County are not common, but did occur several times during a hot spell during the summer of 2002.

Probability of future events: Ozone alerts or other air contamination conditions can occur occasionally in the Town of Elmira.

Potential impact: Some health problems can be triggered by high ozone concentrations. Those most seriously impacted are those with preexisting medical conditions, such as asthma, and those who fail to heed warnings against outside physical exertion.

Vulnerable areas: The entire Town is vulnerable to air contamination.

Estimate of potential losses: Because air contamination problems in the Town of Elmira are not expected to be severe or prolonged, it is anticipated that the medical consequences will be limited to a small number of people.
#23. CIVIL UNREST

**Definition:** An individual or collective action causing serious interference with the peace, security, and/or normal functioning of a community (e.g., riot).

**HAZNY analysis:**
- **Scope:** Several individual locations are vulnerable
- **Cascade effects:** Some potential to trigger another hazard
- **Frequency:** Infrequent event (occurs once every eight to fifty years)
- **Onset:** Several hours warning
- **Hazard duration:** More than one week
- **Incident stabilization:** One to two days of overtime emergency operations
- **Potential impact:** Serious injury or death is unlikely
  - Moderate physical and/or economic damage to private property
  - Little or no structural damage to community infrastructure

**Past hazard events:** Although most labor disputes and public protests occur peacefully, volatile situations have occasionally developed in Chemung County.
- In the late 1980’s, a riot occurred at the Southport Correctional Facility (a maximum-security prison), in which guards were taken hostage. The State Police response was rapid. This incident lasted for one day and resulted in a fire and some serious injuries.
- Bomb threats have been made to schools. During a period with repeated bomb threats to an area high school, tensions mounted between parents and staff over how to handle the situation.
- In February 2001, a serious incident occurred when a student took an arsenal of weapons and bombs to Southside High School in the Town of Southport. Fortunately, no injuries occurred.
- Labor disputes and strikes frequently necessitate increased police scrutiny. Although violent incidents have occasionally been triggered, labor disputes have not led to any incidents of widespread unrest in Chemung County.

**Probability of future events:** Civil unrest can be triggered by political protests, labor disputes, prison violence, or other incidents in the community. Hazards that could trigger civil unrest include: terrorism, epidemic, food shortage, fuel shortage, or radiological release.

**Potential impact:** By definition, an incident of civil unrest would interfere with the peace, security, and/or functioning of the community. However, it is anticipated that any situation that develops in the Town of Elmira could be brought under control relatively quickly, thus limiting the overall impact.

**Vulnerable areas:** Although civil unrest can spread throughout the community, it is most likely to originate at the site of a triggering controversy. Potential locations include work places,
schools, prisons, places of worship, or other public areas. The Critical Facilities and Vulnerable Sites maps in Attachment A show the locations of schools, government buildings, emergency response facilities, and religious meeting places. The only two synagogues in the County and a Jewish Community Center are located in the Town of Elmira. Both synagogues have security systems.

Estimate of potential losses: If a riot develops in the Town of Elmira, it is anticipated that law enforcement activities will successfully confine the violence and destruction to a small area. The potential property damage from such an incident could be a few hundred thousand dollars. Additional economic losses can occur if businesses are unable to function.

#24. FIRE

Definition: Uncontrolled burning in residential, commercial, industrial, institutional, or other properties in developed areas.

HAZNY analysis:
- Scope: Several individual locations are vulnerable
- Cascade effects: Unlikely to trigger another hazard
- Frequency: Infrequent event (occurs once every eight to fifty years)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Moderate physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: Some of the more severe fires in Chemung County include:
- In the 1980’s, a major fire at the Arnot Mall in Big Flats resulted in partial collapse of the roof. Shoppers and employees were successfully evacuated with no injuries.
- Anchor Glass in the Town of Elmira and Village of Elmira Heights has experienced several fires near the molten glass tanks in which employees were near the fire trying to “save” the molten glass. If the tank fails, it is necessary to spray water on the molten glass to solidify it.
- In November 2000, a 300-foot warehouse in the Town of Southport was destroyed by fire, resulting in millions of dollars of losses.

Probability of future events: Most fires are started by people through negligent behavior. Although house fires are a regular occurrence in the Town of Elmira, they rarely spread to adjacent properties. Fires impacting larger facilities can occur occasionally.

Potential impact: A major fire in the Town of Elmira is expected to be confined to a single structure or building complex. Development patterns are such that most buildings are surrounded by lawns or parking areas, which protect against the spread of fires to adjacent
structures. The use of asphalt shingles also protects against the spread of fire. All fires pose a risk to occupants of the buildings involved and to the firefighters who work to control the blaze. Fires may cause power failures, air contamination, hazardous material releases, structural collapse, or transportation accidents.

**Vulnerable areas:** The areas most vulnerable to multi-structure fires are those with closely spaced older buildings. Areas of closely spaced houses occur near the City of Elmira. Industrial facilities that utilize flammable materials are also at risk. Many church buildings (shown on the Vulnerable Sites map in Attachment A) are vulnerable due to the wide expanses within which it would be unsafe for firefighters to combat a blaze. Elderly residents are more likely to be injured or killed by a fire, due to limited mobility and susceptibility to respiratory problems from the smoke.

**Estimate of potential losses:** The County Emergency Manager/Fire Coordinator indicates that a credible worst-case fire in the Town of Elmira would be one that results in the complete loss of an industrial or commercial building. The Town has several buildings for which the loss of the structure and its contents would exceed a million dollars. The highest assessed value for a single property in the Town of Elmira is $5,918,400.

### #25. RADIOLOGICAL RELEASE IN TRANSIT

**Definition:** A release or threat of release of radioactive material from a transportation vehicle (including truck, rail, air, and marine vehicle) or other mechanism.

**HAZNY analysis:**
- **Scope:** Large region is vulnerable
- **Cascade effects:** Unlikely to trigger another hazard
- **Frequency:** Infrequent event (occurs once every eight to fifty years)
- **Onset:** No warning
- **Hazard duration:** Less than one day
- **Incident stabilization:** Less than one day of overtime emergency operations
- **Potential impact:** Serious injury or death is unlikely
  - Little or no physical and/or economic damage to private property
  - Little or no structural damage to community infrastructure

**Past hazard events:**
- The only event involving radiological material that is known to have occurred in Chemung County was a traffic accident involving a motor vehicle carrying low level radioactive material. The integrity of the container was maintained and no release occurred.
- Radioactive material was detected at the Steuben County transfer station in the Town of Erwin. The source of the contaminated material is not known.
Probability of future events: There are no sites in the Town of Elmira where radioactive material is used or stored. A transportation accident involving radiological material could result in the release of radioactive substances. Although Elmira is not located on a route routinely used to transport radioactive fuels, weapons or waste, small amounts of radioactive material associated with medical, research and industrial uses may pass through the Town. If a transportation accident were to occur, the packing and other safety measures utilized are likely to prevent the release of radiation. Another mechanism for a radiation release is a terrorist attack utilizing a “dirty bomb.” However, this is unlikely because the vandals and homegrown terrorists that pose the greatest risk in Chemung County are unlikely to have access to radioactive materials. The probability of that radiological material will be released in the Town of Elmira is very low.

Potential impact: The potential health risks associated with a release of radioactive material include direct exposure and ingestion through the food chain. Since it is unlikely that a large amount of material would be involved in an incident in Elmira, the impact on public health is not expected to be great. The primary impact would be economic, due to the potentially high cost associated with decontamination of the affected area and the cost to farmers whose fields, livestock, or crops might be contaminated. Civil unrest might develop as a result of uncertainty and fear on the part of the public concerning possible exposure to radiation.

Vulnerable areas: The transportation routes through the Town and sites of past roadway crashes are shown on the Transportation Infrastructure map in Attachment A.

Estimate of potential losses: The most credible incident in which radiation could be released in the Town of Elmira would be a traffic accident involving a vehicle transporting radioactive material. The materials involved would probably be classified as low level and are likely to be identified, contained, and removed without widespread contamination. According to the Chemung County Director of Emergency Services, the response and cleanup costs from such an incident are unlikely to exceed $5,000.

#26. FUEL SHORTAGE

Definition: A situation in which the normal quantity and/or timely delivery of fuel supplies to distributors and retail establishments is interrupted for a substantial period of time.

HAZNY analysis:
- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Infrequent event (occurs once every eight to fifty years)
- Onset: More than one week warning
- Hazard duration: More than one week
- Incident stabilization: Three days to one week of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Moderate physical and/or economic damage to private property
Little or no structural damage to community infrastructure

**Past hazard events:** There have been no fuel shortages in Chemung County since the OPEC oil crisis in the early 1970’s.

**Probability of future events:** A local fuel shortage could result from a prolonged disruption of transportation, which might be caused by a winter storm, flood, or other major event. Supply shortages can occur as a result of trade, transmission difficulties, or unexpectedly high demand. The probability of a severe fuel shortage is considered to be low.

**Potential impact:** The primary impact of the oil shortage in the 1970’s was economic, with customers experiencing long lines and high prices. A wintertime shortage of heating oil or natural gas could lead to injuries and deaths due to an inability to provide adequate heat or inappropriate use of alternate heat sources.

**Vulnerable areas:** Since a fuel shortage would result in higher prices, lower income residents and businesses with high fuel use (such as truckers and farmers) would be most vulnerable.

**Estimate of potential losses:** The Chemung County Emergency Management Office estimates that the business losses resulting from a fuel shortage could reach a half million dollars.

#27. **LANDSLIDE**

**Definition:** The downward and outward movement of slope-forming materials reacting to the force of gravity. Slide material may be composed of natural rock, soil, artificial fill, or combinations of these materials. The term landslide is generalized and includes rock-falls, rockslides, creep, block glides, debris slides, earth-flow, mud flow, slump, and other similar terms.

**HAZNY analysis:**
- **Scope:** Several individual locations are vulnerable
- **Cascade effects:** Some potential to trigger another hazard
- **Frequency:** Infrequent event (occurs once every eight to fifty years)
- **Onset:** No warning
- **Hazard duration:** Less than one day
- **Incident stabilization:** Less than one day of overtime emergency operations
- **Potential impact:** Serious injury or death is unlikely
  Little or no physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

**Past hazard events:**
- An active landslide is located on Seeley Creek in the Town of Southport. The exposed scarp is currently ¼ mile long and approximately 200 feet high. This unvegetated slope is steadily
depositing sediment into the creek, but has not experienced large-scale or catastrophic motion in recent years.

- In 1994, a steep hillside failed in the Town of Veteran (Chemung County) 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.
- A small landslide area exists on the Mark Twain golf course in the Town of Horseheads.
- A couple of minor landslides have occurred in creeks on East Hill in the Town of Elmira.
- Unstable slopes along road cuts and roadside drainage ditches pose localized problems when erosion and mass wasting occurs.

**Probability of future events:** The Town of Elmira is located in an area of New York State that is classified as having a low susceptibility for landslides (source: *Draft New York State All Hazard Mitigation Plan*, prepared by Mitigation Section, New York State Emergency Management Office, April 2003). No landslide prone areas have been identified in the Town of Elmira. However, the steep topography in some parts of the Town, combined with the presence of poorly consolidated glacial deposits, may pose landslide hazards in some areas. The risk of landslides increases if clear cutting occurs on steep slopes (greater than 15%).

**Potential impact:** Most of the steep slopes in the Town that might be subject to slope failure are in undeveloped or sparsely developed areas. A landslide could destroy buildings and infrastructure in a localized area. Injury or death of people in the affected area is also possible. In addition, a landslide that blocks a stream or drainage way could back up water and cause flood damage.

**Vulnerable areas:** The steep areas, which pose the highest risk for landslides, are on rural hillsides, most of which are undeveloped. However a couple of houses are located on steep slopes on West Hill. The stability of these slopes has not been assessed. It is advisable that development or timber harvesting on steep slopes include an evaluation of the potential to destabilize the slope and induce landslides.

**Estimate of potential losses:** The potential consequences of a landslide in the Town of Elmira could include destruction of one or two rural buildings and adjacent infrastructure (roads, utilities, pipelines). These losses could cost several hundred thousand dollars.

### #28. WATER SUPPLY CONTAMINATION

**Definition:** The contamination or potential contamination of surface or subsurface public water supply by chemical or biological materials that results in restricted or diminished ability to use the water source.
HAZNY analysis:
- **Scope:** Large region is vulnerable
- **Cascade effects:** Highly likely to trigger another hazard
- **Frequency:** Rare event (occurs less than once every fifty years)
- **Onset:** No warning
- **Hazard duration:** Less than one day
- **Incident stabilization:** Less than one day of overtime emergency operations
- **Potential impact:**
  - Serious injury or death is unlikely
  - Little or no physical and/or economic damage to private property
  - Little or no structural damage to community infrastructure

Past hazard events: The Chemung County Health Department reports that a boil-water advisory is issued for a public water supply somewhere in the County almost every year. In addition, private wells can become contaminated. The primary source of water for the Elmira Water Board is the Chemung River. When the turbidity of the river is high, water is drawn from the Hoffman Reservoir. This occurs about 12 times per year.
- The Elmira Water Board filtration plant flooded during the 1972 Tropical Storm Agnes flood. Customers were advised not to drink the water for about a week.
- The Town of Big Flats discontinued the use of a public water supply well due to salt contamination.
- Town of Big Flats municipal wells have experienced nitrate pollution problems in the past. Possible contamination sources include industry and agriculture.
- In the 30 years from 1971 to 2001, there have been 619 reported waterborne outbreaks at community and non-transient non-community water systems in the United States. It is estimated that only about a third of the outbreaks are reported, so the actual occurrences are likely higher. Over 18% of the reported occurrences (or 113 outbreaks) have been associated with distribution system problems. The outbreaks caused by distribution system deficiencies caused over 21,000 cases of illness and resulted in 9 deaths and nearly 500 hospitalizations. These outbreaks were mostly attributed to microbial and chemical contamination from cross-connections and backsiphonage (source: NYS Rural Water Association website).

Probability of future events: Public water in the Town of Elmira is provided by the Elmira Water Board. The primary source of water is the Chemung River Aquifer, with the Hoffman Reservoir serving as a backup water source. Additional protection is provided by interconnections with neighboring municipal water supplies (Big Flats and Horseheads). The New York State Department of Health is currently evaluating the susceptibility of public water supplies to potential contamination as part of the Source Water Assessment Program. Protective measures will be implemented as warranted. A vulnerability assessment has been conducted in compliance with federal requirements and all identified security deficiencies are being addressed. This vulnerability assessment and the Elmira Water Board’s Emergency Response Plan will be reviewed and updated annually. In addition, the ongoing maintenance and operational procedures of the Elmira Water Board are intended to minimize the risk of contamination within the distribution system.
Potential impact: It is anticipated that any contamination problem that may develop to a municipal system serving the Town of Elmira would be identified and resolved quickly. Because of the frequency of water quality testing, it is unlikely that contamination of the public water supply will have public health impacts prior to detection and notification of consumers. However, contamination of private well water can go undetected and untreated for a prolonged period of time.

Vulnerable areas: The Elmira Water Board serves approximately 2,090 residential, commercial, and industrial customers in the Town of Elmira in the areas north and west of the City of Elmira. Areas served by private water supply wells are vulnerable to aquifer contamination, particularly in areas where onsite wastewater treatment systems are located on small lots.

Estimate of potential losses: If the Elmira Water Board is unable to provide potable water to any of the 2,090 customers in the Town of Elmira, it is anticipated that drinking water could be supplied by truck or some other means with few resulting health threats. The Chemung County Emergency Management Office estimates that the expense for providing alternate water would be a few thousand dollars. More significant expenses would be incurred if a water treatment system is necessary or if aquifer contamination necessitates extension of public water service to areas that are currently served by private wells.

#29. FOOD SHORTAGE

Definition: A situation where the normal distribution pattern and/or the timely delivery of foodstuffs to retail establishments for normal consumer demand is interrupted for a substantial period of time.

HAZNY analysis:
- **Scope:** Large region is vulnerable
- **Cascade effects:** Highly likely to trigger another hazard
- **Frequency:** Rare event (occurs less than once every fifty years)
- **Onset:** Several days warning
- **Hazard duration:** Four days to one week
- **Incident stabilization:** One to two days of overtime emergency operations
- **Potential impact:** Serious injury or death is unlikely
  Little or no physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: Chemung County experienced food shortages following Tropical Storm Agnes in 1972 and during the blizzard of 1993.

Probability of future events: A food shortage is most likely to occur as a result of a prolonged disruption of transportation, which could be caused by a winter storm, flood, or other major
event. Widespread crop failures could also contribute to a shortage of some types of food products. The probability of a prolonged or severe food shortage is considered to be low.

Potential impact: A food shortage is unlikely to persist long enough to cause any serious problems. Possible cascade effects could include looting and civil unrest.

Vulnerable areas: Although the entire population of Elmira could be vulnerable to a food shortage, high prices for limited food supplies would be expected to have the greatest impact on low income residents. Individuals with specific dietary requirements (such as formula-fed babies) would also be vulnerable.

Estimate of potential losses: One local grocery store, which does not serve the entire population of the Town, does approximately $300,000 in business per week. It is estimated that the economic loss caused by a one week disruption in the food supply could be about a half million dollars.

HAZARDS NOT APPLICABLE

The following hazards are not applicable to the Town of Elmira. No additional assessment of risk was conducted.

- **Avalanche**: An avalanche is a mass of sliding snow which usually occurs in mountainous terrain where snow is deposited on slopes of 20 degrees or more.

- **Blight**: Blight is a disease of agricultural crops or non-agricultural plants resulting in withering, lack of growth, and death of its parts without rotting. Because the crops grown in the Town of Elmira are not susceptible to blight, this hazard was not evaluated.

- **Coastal Erosion**

- **Coastal Storm**

- **Hurricane**: A hurricane is a tropical cyclone in which wind speeds reach 74 mph or more. Inland flooding from hurricanes can be a major threat to areas hundreds of miles from the coast as intense rainfalls from huge tropical air masses. Chemung County has suffered repeated damage from inland flooding associated with hurricanes (Agnes in 1972, Eloise in 1975, Beryl in 1994), but is not susceptible to hurricane force winds. When a hurricane tracks inland, its wind speeds generally decrease and the cyclone is downgraded to a tropical storm or tropical depression. The intense rainfall from these tropical storms is a major threat to the Town of Elmira. This hazard is considered above with flooding and flash flooding.

- **Land Subsidence**: Land subsidence can occur in areas underlain by limestone bedrock, where dissolution of the limestone creates cavities, which can collapse and form sink holes. Areas with extensive mining of groundwater can also experience land subsidence. These conditions do not occur in Elmira.
• **Mine Collapse**: There are no mining activities in the Town of Elmira that involve the excavation of an underground cavity.

• **Radiological Release from a Fixed Site**: This hazard involves a release or threat of release of radioactive material from a nuclear power generating station, or research reactor, or other stationary source of radioactivity. Elmira is located outside of the 50-mile radius of concern for any nuclear power generating stations (source: *Draft New York State All Hazard Mitigation Plan*, prepared by Mitigation Section, New York State Emergency Management Office, April 2003). The possibility that a catastrophic event at a nuclear facility could bring very low concentrations of radiation into the area is considered remote.

• **Tsunami/Wave Action**

• **Volcano**
FLOOD HAZARDS AND PROBLEMS

**Flood hazards** occur in areas that are prone to flooding, whether or not any development is affected. This Plan addresses the following hazards throughout the Town of Elmira: riverine flooding, overland flooding and ponding, stormwater problems, groundwater flooding, and erosion of streambanks. The Town’s Flood Insurance Rate Maps and Flood Insurance Study include detailed analyses of the flood hazards from some of the principle waterways in the Town. The identified areas of 100-year and 500-year flooding are shown on the Flood Hazards and Problems map in Attachment A. Additional hazards due to flooding and bank erosion exist along every stream in the Town and many unmapped drainage ways. The hazard areas for overland flooding, ponding, and groundwater flooding are generally not recognized unless they contribute to flooding problems. The potential hazard areas are thus widespread.

**Flood problems** occur when development is adversely impacted by flood hazards. Numerous flood problem areas have been identified throughout the Town of Elmira. These problems are described below, shown on the Flood Hazards and Problems map in Attachment A, and listed in the Summary of Flooding Problems table in Attachment A. This information about flooding problems was assembled from previous documentation, and the knowledge of Flood Mitigation Planning Committee members, Town officials, residents, and agency personnel familiar with flooding in the Town of Elmira.

The principle sources of flooding in the Town of Elmira are the Chemung River (which forms parts of the southern corporate limit), small streams that flow down the steep slopes of West Elmira, Newtown Creek (near Elmira Heights), and Goldsmith Creek (on East Hill). Development is concentrated in the river valley and on the hillsides of West Elmira. Development within the mapped 100-year floodplain is heaviest between the City of Elmira and the Village of Elmira Heights. Development in the other mapped floodplains within the Town is light and scattered. Many areas of the Town that are subject to flooding are not mapped as 100-year floodplain.

The most severe river flooding in the Town occurred during the devastating Hurricane Agnes Flood in June 1972. Water overtopped the Chemung River levee and inundated low-lying areas. Torrents of water caused serious erosion problems along many of the Town’s tributary streams. Since that time, the Town has experienced flooding in September 1975 (Hurricane Eloise), June 1976 (“Fathers’ Day Flood”), April 1993 (“Blizzard of ‘93” snowmelt), August 18, 1994 (Hurricane Beryl), January 19, 1996 (snowmelt and heavy rain), November 8 to 9, 1996 (heavy rain), February 28, 1998 (localized rainfall), and June 30, 1998 (thunderstorms with heavy rainfall). In addition to these flood events, many additional heavy rainfall events have caused localized drainage problems, ponding, streambank erosion and other difficulties.
RIVERS AND STREAMS WITH MAPPED FLOODPLAINS

Riverine flooding occurs when streams and rivers overflow their banks and inundate adjacent valleys. This occurs when heavy rainfall or rapid snowmelt produces water runoff that exceeds the carrying capacity of the channel. Riverine flood damages can be triggered or exacerbated by constriction or obstruction of stream and river channels. This blockage can result from undersized drainage structures, debris dams, ice jams, or accumulation of sediment within the channel. Backwater flooding occurs when a stream is unable to flow into a larger stream or river due to high water in the downstream waterbody.

The Town’s Flood Insurance Rate Maps (FIRMs) identify the areas expected to be inundated by the 100-year and the 500-year flood on the Chemung River and the major streams. Development within the 100-year floodplain is regulated by local law. The FIRMs also provide the expected water elevations for the 100-year flood. Flood profiles and supporting documentation are provided in the Flood Insurance Study. It should be noted that the hydraulic analyses used to delineate floodplains on the FIRMs were based on the assumption of unobstructed flow. The floodplains and flood elevations indicated on these maps are thus considered valid only if all channels and drainage structures remain unobstructed, operate properly, and do not fail. If these conditions do not exist, the impact of 100-year flooding could be greater.

Chemung River

The Chemung River flows generally eastward past the Town of Elmira, forming portions of the southern corporate limits of the Town. The drainage area of the Chemung River upstream of the Town is 2,506 square miles. Flood protection along the Chemung River is provided by four upstream dam projects: Arkport Dam on the Canisteo River (Steuben County, NY), Almond Dam on Canacadea Creek (Steuben County, NY), the Tioga-Hammond Dam Project on the Tioga River and Crooked Creek (Tioga County, PA), and the Cowanesque Dam on the Cowanesque River (Tioga County, PA). These structures reduce peak flows during flood events and prolong the period in which the river is bank full following each event.

West of the City of Elmira, the Town of Elmira has approximately 2 1/4 miles of riverfront along its southern border. About 1 mile of this riverfront is protected by a flood control levee that extends westward from the City limits. This levee is maintained by the State Department of Environmental Conservation. The most recent high water events (January 1996 and November 1996) saw water several feet above the base of this dike. During the 1972 Hurricane Agnes Flood, this levee was overtopped and floodwaters extended beyond the predicted extent of the 500-year flood. Damaged sections of the dike were subsequently restored to their previous condition. West of the levee are unprotected low lying areas that routinely flood long before high water reaches the base of the dike. Islands in the river are also within the Town municipal boundaries.

East of City of Elmira, the Chemung River forms the Town of Elmira boundary for
approximately 2 ½ miles and flows within the Town for about 1 mile (at Big Island). The floodplain in this area is undeveloped.

Emergency services for part of East Elmira operate out of the Wellsburg Fire Station, which is located within the Chemung River and Bentley Creek floodplains in the Village of Wellsburg. The building houses the Wellsburg Fire Department, a New York State Police substation, and the Village offices. The floor is approximately 4 feet below the predicted elevation of the 100-year flood. This building was constructed in 1946 and sustained flood damage in 1972, 1975, and 1996. During the January 1996 flood, the fire station was flooded to a depth of 54”, causing more than $250,000 in damage, primarily to building contents and equipment. The building was subsequently restored. The Village is pursuing alternatives for relocating the fire station to a site that is less vulnerable to flooding.

PROBLEMS:
1. **Bank erosion**: Continuing riverbank erosion is a problem in the area of River Drive and farther west. The problem has become more severe in recent years as gravel deposition increases the size of Fitch’s Island. Four residential properties (houses, yards, and septic systems are threatened.

2. **Unprotected floodplain in west Elmira**: Twenty-six houses are located in the 100-year floodplain along 8 Town streets west of the area of levee protection. Numerous additional homes in this area were inundated by the 1972 Hurricane Agnes flood.

3. **Area with levee protection**: A levee on the left (north) bank of the Chemung River protects residential development from the 100-year flood, but does not provide adequate protection from the 500-year flood. Failure or overtopping of this levee would result in rapid inundation of this area, as occurred in 1972.

4. **Dam failure (not shown on map)**: The emergency plans for catastrophic releases of water from the Tioga, Hammond, and Cowanesque Dams indicate that such an event could inundate significant portions of the Town of Elmira, with arrival times of 11 or more hours. Although the possibility of such an occurrence is considered to be extremely remote, the potential damages could be quite severe.

**Diven Creek and McCann’s Tributary**

Diven Creek forms the southern boundary of the Town of Elmira for approximately ½ mile in the area north of the City of Elmira. McCann’s Tributary (also the old Chemung Canal) flows through the Town for approximately ½ mile before entering Diven Creek. Both streams have very low gradients and the area around their confluence is a state-regulated wetland. Low-lying land in this area is affected by high water in McCann’s Tributary, Diven Creek, and backwater from Newtown Creek to the east. In 1997, sediment and debris were removed from McCann’s Tributary and Diven Creek in the Town of Elmira. Trees and debris were also removed from the wetland in order to increase its storage capacity. The 6-foot round culvert carrying McCann’s Tributary under McCann’s Boulevard was replaced by a 16-foot wide, 4.5-foot high arch pipe. In addition, the gas line at McCann’s Boulevard was relocated.
The area mapped as the 100-year floodplain of Diven Creek and McCann’s Tributary was delineated based on backwater from Newtown Creek. The predicted elevation of 100-year floodwaters in this area was decreased by one foot following construction of three flood control dams in the Newtown Creek watershed. An additional area along the railroad track (north of the Diven Creek floodplain) is designated as an area of shallow 100-year flooding (less than 2 feet) caused by overflow from Halderman Hollow Creek in the Town of Horseheads.

PROBLEMS:
5. **McCann’s Boulevard and Grand Central Avenue area**: McCann’s Boulevard and Grand Central Avenue have been closed several times in recent years due to flooding. Thirteen residential and commercial properties are located within the 100-year floodplain on 6 streets (College Avenue, Chapman Place, Grand Central Avenue, Garrison Place, East McCann’s Boulevard, and Lake Road). Two homes (on McCann’s Boulevard) and one business (on Grand Central Avenue) have experienced recent flooding, with as much as 18 inches of water on the first floor.

**Newtown Creek**

Newtown Creek flows south for approximately 1 mile through the Town of Elmira, forming part of the municipal boundary in the area north of the City of Elmira. Flood protection along Newtown Creek is provided by four dams constructed by the Natural Resources Conservation Service as part of the Newtown-Hoffman Creeks Flood Protection Project. These structures are: Marsh Dam (located on Marsh Creek in the Town of Erin), Park Station Dam (located on Newtown Creek in the Town of Erin), Sullivanville Dam (located on the North Branch of Newtown Creek in the Town of Horseheads), and Jackson Creek Dam (located on Jackson Creek in the Town of Erin).

The Newtown Creek floodplain in the Town of Elmira includes undeveloped and agricultural land. The County sewage treatment plant is located adjacent to the 100-year floodplain, but has no history of flooding problems.

**Lower Goldsmith Creek**

Goldsmith Creek has a drainage area of 11.4 square miles and is the primary drainage for East Hill in east Elmira. The 100-year and 500-year floodplains have been delineated for the lower mile of Goldsmith Creek, above its confluence with Baldwin Creek.

PROBLEMS:
6. **Jenkins Road**: Bank erosion and meandering downstream of Jerusalem Hill Road threaten the Jenkins Road bridge over Goldsmith Creek. One house on Jenkins Road is located within the 100-year floodplain. Water reaches the foundation and surrounds this house when the creek rises.
Baldwin Creek

Approximately three miles of Baldwin Creek flow through the southeastern section of the Town of Elmira. The creek experiences bank erosion and a buildup of trees and debris. A one-acre area at the confluence with Goldsmith Creek has been leveled to allow for deposition and removal of gravel. A 1998 project was conducted to remove trees from the channel. The stream crosses five properties. Baldwin Creek is a trout stream and the lower reach is stocked with brook trout.

PROBLEMS:
7. Greatsinger Road: One house on Greatsinger Road is located within the 100-year floodplain of Baldwin Creek.
8. Lowman Road: One house on Lowman Road is located within the 100-year floodplain of Baldwin Creek.
9. Jenkins Road: Bank erosion and meandering downstream of the junction with Goldsmith Creek threatens the Jenkins Road bridge over Baldwin Creek. One house with a basement is located in the 100-year floodplain near this bridge and has experienced flooding problems.

STREAMS WITHOUT MAPPED FLOODPLAINS

The potential for riverine flooding from many of the Town’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 is not regulated by the Town’s local law for flood damage prevention. Yet development in these areas is at risk from both flooding and streambank erosion.

Erosion of streambanks and the subsequent deposition of eroded materials are major concerns in the Town of Elmira. The severity of these problems is due, in part, to the widespread occurrence of poorly consolidated glacial deposits, which are particularly susceptible to erosive forces. Natural erosional processes are accelerated during flood events. Bank erosion leads to the loss of lawns and agricultural land and can undermine buildings, roads, and bridges. Severe erosion also degrades riparian and aquatic habitat. Accelerated erosion of banks loosens large volumes of material that are subsequently deposited within stream and river channels, limiting the capacity for carrying water. Sediment and debris accumulation can plug culverts and lodge under bridges, displacing the flow of water. Eroded material that is carried downstream contributes to increased deposition rates in downstream reservoirs and the Chesapeake Bay. Although bank erosion and channel migration are natural processes, they can be accelerated by human activities.

Clark’s Glen Creek

Clark’s Glen Creek is the westernmost of the creeks that flow southward down steep grades to
the Chemung River in west Elmira. It originates in the Town of Big Flats and flows through the suburban Forest Hills area of the Town of Elmira. It descends at a steep grade, through a region dominated by shallow, gravely, highly erodable soils. The largely wooded streambanks contribute an annual load of debris, including leaves, branches, and entire trees. The creek is piped under State Route 352 and thence flows by open ditch to the Chemung River. During high volume rain storms or periods of rapid snow melt, Clark’s Glen Creek erodes its banks or floods adjacent areas at sites where it encounters channel obstruction.

In 1994, downcutting of the creek exposed a gas pipeline and caused streambank erosion in the Forest Hills area. A retaining wall collapsed and the creek moved 10 feet toward a house. Another retaining wall was severely damaged. In 1996 and 1997, the Forest Hills project was undertaken to prevent erosion and property damage, protect 4 houses, protect State Route 352, and protect Rustic Avenue (a Town road). Two fallen concrete walls were replaced, a third wall was constructed to stabilize Rustic Avenue, and a 6-foot drop structure was installed to raise the creek to its former elevation. This project cost $170,000. In 1997, a debris basin was installed upstream of the drop structure (cost $37,000).

In 1998, the County improved drainage at the top of Coleman Avenue to protect the road. These changes are expected to accelerate drainage into Clark Glen Creek and may increase peak discharges.

PROBLEMS:
10. **Whitetail Drive**: Gravel and debris accumulation at the upstream end of a culvert under Whitetail Drive (private road) threaten both the pipe and the roadway.
11. **Forest Hills**: Downcutting and erosion of banks threatens homes and garages in the Forest Hills subdivision. This problem has been partially alleviated by recent construction of retaining walls. An old wooden drop structure downstream of these homes (upstream of State Route 352) has washed out and a second is damaged. If this second drop structure washes out, downcutting of the creek could lead to additional bank erosion and undermining of the walls.
12. **State Route 352**: Accumulation of debris and gravel at the entrance to the box culvert under Route 352 threatens State Highway 352 and Forest Hills Road. A pipeline has recently been relocated by this culvert and buried six feet under Clark’s Glen Creek. The potential for downcutting of the creek in this area (which is maintained by the New York State Department of Transportation) is a concern.

**Whirt’s Creek**

Whirt’s Creek is a small, intermittent creek located east of Clark’s Glen Creek in west Elmira. Flow starts at the top of Larchmont Road. A suburban development is located immediately uphill on Saddle Ridge Drive and Thornapple Drive, with runoff limited by a detention pond. The Town completed construction of another detention structure near the top of Larchmont Road in 2002. Whirt’s creek flows down steep slopes, through highly developed residential properties, before entering a pipe at Coleman Avenue near Route 352. Pipes carry its water, gravel, and
debris load underground to the Chemung River. Bank erosion has been extensive along the entire creek channel. Whenever stream blockage occurs, adjacent properties experience local flooding.

In August 1994, high water from the Hurricane Beryl storm caused significant bank erosion and flooding from overflow at Coleman Avenue. Flooding in this area affected 7-8 homes, one business, and a state highway. The creek was subsequently deepened and stabilized (with sidewalk blocks) and a gabion drop structure was built upstream. A berm was constructed behind one property. In addition, a series of low black top berms were installed on Coleman Avenue, Ohio Avenue, Redfield Drive, and Geneva Street. These structures protect buildings by keeping water on the streets, which become overflow channels. This section of the stream remained within its banks during both floods in 1996.

During the storms of January 1996 and November 1996, Whirt’s Creek caused serious bank erosion at many sites. During the January event, stormwater bypassed a detention pond that services developed properties on the top of the hill. A repair was made and the pond functioned properly during the storm of November 1996. During the November flood, overflow from Whirt’s Creek was diverted across Larchmont Road to the Glen Avenue area, where it compounded flooding problems from Beecher Creek (Problem #19). This site has been mitigated. In a survey of home owners along Whirt’s Creek, nine respondents reported damage from the January 1996 flood: six reported damage to homes and contents (totaling $37,250) and seven reported damage to property (totaling $30,885). Many additional properties are known to have sustained damage as well.

Numerous projects have been implemented on Whirt’s Creek to mitigate the flooding and erosion problems. A serious erosion problem that exposed a gas and sewer line in a front yard on Larchmont Road was repaired with a drop structure and bank stabilization (cost $10,000). During the summer of 1997, 300 feet of creek were stabilized with riprap and 400 feet were piped along Larchmont Road (cost $50,000). A debris-catching basin was installed on Lovell Avenue to collect gravel, trees, leaves and other debris (cost $12,000). About 55 to 60 cubic yards of gravel were removed from this basin in 1998. An erosion problem was repaired on Lovell Avenue in 1996 (cost $18,000). This project was washed out by the storm of November 8, 1996 and subsequently rebuilt (cost $5,000). Five drop structures were installed on Town property between Kiwanis Road and Lovell Terrace.

Heavy rainfall on June 30, 1998 (about two inches of rain in one hour) revealed both the effectiveness of the Whirt’s Creek projects and their vulnerability. A large sinkhole developed at a joint in the new pipe on Larchmont Road. Several pieces of riprap were moved, creating a large pool of water. New erosion occurred near the deck footing of a home. Some water bypassed a newly installed pipe. Despite these problems, the damage was much less than that caused by either of the 1996 flood events. Subsequent construction of the Larchmont Detention Pond will significantly reduce peak discharges during future high water events. This structure is designed to alleviate existing problems and retain stormwater runoff from anticipated development in the upper Whirt’s Creek watershed.
PROBLEMS:
13. **Streambank erosion**: Severe streambank erosion impacts many of the 54 property owners along Whirt’s Creek. Although numerous projects have been implemented to stabilize the stream and prevent property damage, the threats have not been eliminated. There is an ongoing need to maintain and repair the existing structures.

14. **Coleman Avenue**: The 30-inch pipe that carries Whirt’s Creek beneath developed areas to the Chemung River begins at Coleman Avenue. The internal condition of this pipe is not known. Debris has blocked the entrance to this pipe and caused overflow that flooded 7-8 homes, one retail business, and closed the intersection of Coleman Avenue and Route 352. Two houses have experienced first floor flooding of finished living space. The grate over this pipe entrance has been replaced. Debris- and gravel-catchi ng structures have been installed upstream.

15. **Development on Holly Road**: Recent construction of a 7-house development on Holly Road may impact an unnamed western tributary to Whirt’s Creek. The drainage system installed for this development was in compliance with Town regulations, which require that the post-development runoff from the site shall not exceed pre-developed conditions.

**Beecher Creek**

Beecher Creek is an intermittent stream located east of Whirt’s Creek in west Elmira. It drains the top of an unnamed hill, including a new development of suburban homes located along Estates Drive. A detention pond in the upper drainage area (Paternoster Detention Basin) has been built to contain water from the subdivision on Estates Drive Extension. Beecher Creek flows down steep slopes, flowing through an extensive portion of the Elmira Country Club. The Town of Elmira has constructed a detention pond in Beecher Creek on property belonging to the Elmira Country Club. Numerous pipes drain the golf course fairways into the creek. When Beecher Creek leaves the Country Club property, it flows through a region of extensively developed suburban properties. In its lower reaches, it forms a border between the Country Club property and the backyards of several properties along Glen Avenue, then loops between houses on Glen Avenue (flowing in front of two homes), and then returns to the Country Club property. Beecher Creek goes underground at pipe entrances halfway down the lower thoroughfare and flows through pipes to the Chemung River. Many of the 36 property owners along Beecher Creek and more than a dozen adjoining properties have experienced damage from the creek.

Although Beecher Creek is dry most of the time, it carries torrents of water when runoff from surrounding impervious and saturated areas reaches the channel. Development has led to increased runoff because of the inability of hard surfaces to absorb water and the reduced infiltration capacity of soils on the frequently watered golf course property. Erosion has been accelerating since the 1972 flood, which washed out much of the streambank vegetation. Large trees, scores of years old, are now undermined, dying and/or falling down. Residents remember stepping across this back- and front-yard stream at sites that are now up to 6 feet deep and 15 feet wide. Blockage of the channel at high water flows has caused localized flooding with damage to homes, property, and Town roads. Sediment accumulates in the channel in the densely
developed area by Glen Avenue and under two private bridges. One bridge poses an ongoing risk of debris plugging. The removal of sediment and debris from the channel in the Glen Avenue area must be done by hand, because the close proximity to houses prevents the use of equipment.

In 2000, the Elmira Country Club filled a 30” pipe that had conveyed Beecher Creek under a causeway, allowing the stream to flow across the top. A similar structure located a short distance upstream was removed in 1998. Both of those pipes had a history of chronic plugging. When one of the pipes filled with debris, it formed a de facto dam, ponding water on the upstream side. Water has flowed over the top of these “dams,” causing erosion on the downstream side. During the Hurricane Beryl storm of August 1994, plugging of the downstream pipe created an impoundment 15 feet deep before the water overflowed the walkway. During the February 28, 1998 storm event, the downstream pipe came unplugged, sending a surge of water through the downstream residential area. On June 30, 1998, this structure backed up about 6 feet of water due to restricted flow through the pipe.

Beecher Creek overflowed its banks and flooded houses on Glen Avenue in August 1994, January 1996, and November 1996. The Town has identified 39 homes that have been flooded by Beecher Creek. Respondents to a survey reported a total of $92,679 in flood damages in 1996. Flooding of Glen Avenue has resulted in significant road damage, with large areas of pavement ripped out by the floodwater. In order to protect houses on the west side of Glen Avenue, the Town lowered the level of the road to enable the street to carry more water (cost $60-65,000). Efforts to alleviate flooding along West Church Street (State Route 352, located at the base of Glen Avenue) include re-grating of catch basins and channel maintenance to reduce the sediment load. Homeowners have assisted with keeping drains cleaned during high water events.

The Beecher Creek Detention Pond was constructed on the Elmira Country Club property in 1999 to alleviate the flooding, erosion, and sediment problems in downstream areas. This structure was designed to detain flow from a 100-year storm without exceeding the capacity of downstream drainage structures. This results in a significant reduction in both the volume and the velocity of floodwater in Beecher Creek. This project has functioned well during recent high flow events.

An underground pipe conveys Beecher Creek from the lower part of the Country Club property to the Chemung River. A second pipe carries excess water to the southeast. The Town’s engineer estimates that the combined capacity of the two pipes is about ½ of that required to convey the anticipated flow of a 100-year storm. The internal condition of these pipes is not known. The capacity may be reduced if sediment has accumulated within the pipes. Grates have been installed to prevent debris from entering the pipes. However, debris accumulation on the grates restricts flow into the pipes and requires removal during flood events. Blockage of these grates with debris has caused flooding of one house on Grandview Avenue and threatened 4 others.
PROBLEMS:

16. Streambank erosion: Streambank erosion affects approximately 12 properties along Beecher Creek (including extensive areas on the Country Club property). This erosion currently threatens one house (the creek flows under the foundation of an attached garage) and many yards. The resulting accumulation of sediment and debris within the channel threatens many more residential properties.

17. Country Club causeway: A pipe that once conveyed Beecher Creek under a causeway on the Country Club property is no longer in use. The pipe was filled and reinforced with fill so that the stream now flows over the top. This eliminates the potential for damming at this site, which had been a recurring problem.

18. Fern Dell Drive: Five homeowners on Fern Dell Drive reported flood damage to homes and property in 1996. The two pipes that carry Beecher Creek under the road have both experienced problems. One pipe plugged with debris, requiring installation of a grate. Erosion on the downstream side of the lower pipe has not yet been mitigated. Upstream construction of the Beecher Creek Detention Pond will significantly reduce the peak discharges in this area during future flood events.

19. Glen Avenue and adjacent streets: Twenty-five homeowners in the Glen Avenue area have reported flood damages from Beecher Creek in 1994 and 1996. Most of these houses have basements. Few residents carry flood insurance. Upstream construction of the Beecher Creek Detention Pond will significantly reduce the peak discharges in this area during future flood events.

20. Pipes to the Chemung River: Previous concerns about the capacity of two pipes that convey Beecher Creek from West Church Street to the Chemung River have been alleviated by construction of the Beecher Creek Detention Pond. The internal condition of these pipes is not known. Five houses are at risk of flooding when the grates at the entrance to the underground pipe system become blocked with debris.

Hoffman Brook

Hoffman Brook flows from the Town of Big Flats, through the northwestern part of the Town of Elmira and into the City of Elmira. It is impounded by two reservoirs. The upper dam was constructed for flood control as part of the Newtown-Hoffman Creeks Watershed Project and is maintained by Chemung County. The Elmira Water Board operates the lower reservoir as a water supply. The area along Hoffman Brook in the Town of Elmira is largely rural and undeveloped.

PROBLEMS:

21. Dam failure: Both of the dams on Hoffman Creek are inspected annually by the State Department of Environmental Conservation and are structurally sound. The Chemung County Comprehensive Emergency Plan indicates that the greatest threat to life and property is posed by the lower dam (due to its location, size of impoundment, and age). The area immediately downstream that would be severely impacted includes floodplain areas in the Town and City of Elmira. The primary hazards in the Town are: loss of the electric substation off Hillcrest Road and damage to numerous homes, streets, and
utilities (on Hillcrest Road, Sunset Drive, and Conklin Street).

22. **Sunset Drive:** Streambank erosion threatens two residential properties.

**Heller Creek**

Heller Creek flows through a rural area in the northwestern part of the Town of Elmira before flowing into the City of Elmira. It is impounded by a dam at the Elmira Correctional Facility (reformatory). This dam was in a state of significant disrepair in about 1990, when the State Department of Environmental Conservation requested that the structure be brought into compliance with dam safety standards. During a January 1998 high water event, seepage in the area of the spillway of this dam raised serious concerns regarding the soundness of the structure. These concerns led emergency officials to prepare for evacuation of downstream residents. The State Department of Corrections opted to remove the dam, but the local communities requested that it be retained for flood control. Reconstruction of the dam was completed in 2000. The new structure is lower, but will provide comparable flood control for storms in excess of the 1-year event. The project included construction of a debris basin immediately upstream of the reservoir.

**PROBLEMS:**

23. **Reformatory dam:** The Elmira Correctional Facility dam is classified as a high hazard dam, based on the location of downstream development. Although the dam is located in the Town of Elmira, most of the downstream development is in the City of Elmira.

**Badger Creek (also called Watercure Creek)**

Badger Creek is a tributary to Newtown Creek that flows down a steep hillside in east Elmira and into the City of Elmira. It flows through a very steep and inaccessible valley.

**PROBLEMS:**

24. **Watercure Hill Road:** Badger Creek and a drainage way that carries ditch flow under Watercure Road are undermining and eroding the road. This problem is aggravated by a couple of lodged trees that divert flow within the channel. However, the trees are inaccessible for removing due to the steep narrow character of the valley.

**Upper Goldsmith Creek (above the reach with a delineated 100-year floodplain)**

Goldsmith Creek originates in the Town of Horseheads and flows south through east Elmira before flowing into Baldwin Creek. Short term/high volume rainstorms or rapid snowmelt cause high water levels that result in extensive streambank erosion, gravel deposition, and organic debris accumulation. Road and bridge infrastructure is threatened. Homes are flooded and threatened by bank erosion. Farmland is eroded and topsoil lost. The Town has sought to maintain channel capacity by repeatedly removing gravel from the channel of Goldsmith Creek and its tributaries. Increased flows have been attributed to the replacement of culverts by larger structures (in the Town of Horseheads and in the Town of Elmira). The Town is evaluating potential sites for retention or detention of water in the Goldsmith Creek watershed. The drainage
area for Goldsmith Creek includes many sites that are well suited for future development, which may lead to additional increases in the flows within this creek.

PROBLEMS:
25. **West branch of Goldsmith Creek**: Bank erosion along the west branch of Goldsmith Creek produces significant bed loads of gravel that contribute to the sedimentation problems downstream.

26. **Monkey Run Road**: In 1995, the Town increased the capacity for Goldsmith Creek where the east branch passes beneath Monkey Run Road. The single culvert at this site previously caused water to back up on the north side of Monkey Run Road, occasionally flowing over the road and causing road damage. To alleviate this problem, the Town installed a second culvert. The increased flow enabled by these double pipes effectively protects the road at this site, but has led to severe erosion downstream. Two houses and another bridge on Monkey Run Road are now at risk. After installation of the double pipes, the creek eroded 15 feet of bank adjacent to a house. The property owner installed riprap on the bank in 1996, which has effectively protected the house during subsequent high water events, including the November 1996 flood.

27. **Draht Hill Road**: The bridge where Draht Hill road crosses Goldsmith Creek has experienced erosion damage to the wing wall. This structure is scheduled for replacement. In addition, one private drive and a farm field are threatened by severe erosion.

28. **Jerusalem Hill Road**: Goldsmith Creek is 75-80 feet wide and filled with gravel in the area near Jerusalem Hill Road. Water frequently overflows the banks, flooding agricultural fields and a house. The Jerusalem Hill Road bridge over Goldsmith Creek is unable to handle peak flows, partially because of the size of the bridge and partially because of debris accumulation and blockage. This causes Goldsmith Creek to back up and repeatedly flood the house immediately northeast of the bridge. This flooding has also put the road itself under water and flowed around another home on the southeast side of the road. The last two owners of the house northeast of the bridge have abandoned the property due to repeated flood damages and an inadequate septic system. A bank renovated the site in 1997 prior to placing the property on the market. Because there is no mapped floodplain along this section of Goldsmith Creek, these renovations were not covered by the Town’s flood damage prevention regulations. In addition, mortgage lenders have not required flood insurance coverage for this structure or notified potential buyers of the flooding problems.

29. **Stiles Road Tributary to Goldsmith Creek**: Bank erosion and gravel buildup at culverts on Stiles Road, Bridgeman Road, and Gunderman Road (Barchet Road) threaten these roads and surrounding property. Current development is likely aggravating these problems.

**DRAINAGE AND PONDING PROBLEMS**

Overland flooding and ponding occurs when excess runoff is not carried in a defined channel. It
leads to flood damages when structures are improperly sited and stormwater runoff is not properly managed at development sites. Alteration of natural drainage patterns has contributed to sedimentation and flooding problems at several locations in the Town of Elmira. Inadequate maintenance of roadside ditches and culverts contributes to flooding, scouring, and gravel deposition on roads and adjoining properties. In winter months, hazards are caused by freezing of water on road surfaces.

Particular concerns in west Elmira are the entrances to pipes and culverts. Plugging or blockage of these structures poses an ongoing flooding threat to roads and homes. The structures of concern convey water under roads or into the system of underground pipes to the Chemung River. The structures that have experienced blockage problems in the past include: Clark’s Glen Creek at Whitetail Drive (Problem #10), Whirt’s Creek at Coleman Avenue (Problem #14), Beecher Creek at Fern Dell Drive (Problem #18), Beecher Creek at Country Club Drive (Problem #20), unnamed drainage at Pinewood Circle (Problem #33), and Yunis drainage way at 2nd Street (Problem #36). Additional problems occur when the flow into street-side drains is obstructed, causing water to pond on roadways (especially on Church Street, Problem #31).

In addition to the specific problem areas described below, localized neighbor-to-neighbor drainage problems occur at numerous locations throughout the Town. These problems arise as overland flow drains across adjoining properties. The Town’s enforcement of stormwater management requirements is intended to minimize the development of new problems.

PROBLEMS:

30. **Redfield Drive**: A house on Redfield Drive was built in a low spot that had formerly conveyed stormwater to the Chemung River. This house experienced chronic flooding until the Town built a diversion ditch, which prevented flooding of this house in the last three storms.

31. **Church Street**: Plugging of stormwater drains on Church Street (State Highway 352 West) contributes to ponding of water. This is a particular concern during major storm events when large amounts of water are conveyed to Church Street by roads coming down the hill. Water that is unable to enter the Church Street storm sewer system floods the street and adjacent houses.

32. **West Elmira underground drainage system** (not shown on map): An extensive underground drainage system underlies the west Elmira flats between Coleman Avenue and the City of Elmira line. The internal condition of this network of pipes is not accurately known. It is the Town’s understanding that the State Department of Transportation is responsible for maintenance and repair of this drainage system. Limited blockages within these pipes have been removed by the Town. The potential area that could be affected by a major blockage within this system is not known.

33. **Pinewood Circle**: Water from an unnamed drainageway is conveyed underground from the north side of Pinewood Circle to Forest Hills Road. The upper entrance to this pipe has plugged, causing flooding of the road and yards. This pipe was replaced with a larger one, which seems to have mitigated the problem. A short distance downstream of Pinewood Circle, a privately owned culvert conveys this drainage underground through
three residential properties. This subsurface drainage structure is undersized and inadequately maintained; water regularly flows over the top. This structure is jointly owned by three property owners.

34. Lone Pine Terrace and Hillbrook Road: An open ditch at adjoining back yards was intended to handle drainage from the area of Lone Pine Terrace and Hillbrook Road. Debris and plant growth plugs this ditch during high water. At least 10 properties are affected by ponding in this area.

35. Upper Underwood Avenue: Ponding and sheet flooding occurs in the back yards of 9 houses on upper Underwood Avenue.

36. Yunis Development and Long Meadow Drive: A system of drainage ways and five detention ponds were constructed on an unnamed intermittent stream in 1990 when the Yunis Development was built on Clinton Street. These drainage structures have degraded with time and now require repairs. The culvert under 2nd Street is subject to plugging. Three new houses on Long Meadow Drive get water in the basements as a result of poor surface drainage. These houses were not elevated, as had been specified in the original plans reviewed by the Town.

37. Fassett Road area: Numerous drainage problems occur near the City of Elmira line in the area uphill of Fassett Road. A series of open ditches and pipes that convey water into the Hoffman stormwater system are inadequate to handle the surface runoff. These problems impact the yards and driveways of dozens of homes in both the Town and the City.

38. Upper Hillcrest Road: The road ditch in front of three residences on upper Hillcrest Road has had a history of plugging at driveway culverts and at a curve in the road, causing water to flow over the road. The ditch was recently deepened and new culverts were installed.

39. Lower Hillcrest Road: Runoff from the hill floods about four houses and damages lower Hillcrest Road. The County has done extensive ditch and culvert work in this area.

40. West Hill Road: Water draining off West Hill Road and developed properties causes flooding of one house and about 6 yards in the Town of Elmira and additional problems in the City of Elmira. A project to direct this water into Heller Creek has been initiated.

41. Monkey Run Road: An agricultural diversion ditch (½ mile long) was constructed (by the USDA Soil Conservation Service) in the 1970's to divert water into a small drainage way that flows into Goldsmith Creek. This diversion ditch significantly increased flows on the neighboring property onto which it discharged. During Hurricane Beryl (August 1994), a torrent of water flowed through this single story house (right in the back door and out the front). The drainage way was enlarged to accommodate the increased flow of water and protect the house from additional flooding. Severe erosion now threatens the garage. The drainage way that could once be stepped across is now 6 feet deep and up to 15 feet wide. Downstream, where this drainage way passes under Monkey Run Road, the culvert has been replaced by a larger one, which has repeatedly filled with erosion products. When the culvert plugs, water flows across the road and floods another house. The Town spends over $1,000 to clean the gravel from the area around this culvert after every major storm.

42. East Hill (not shown on map): There are numerous sites throughout the East Hill area where heavy rainstorms wash gravel from private drives and road ditches onto the roads.
The lower ends of some drives experience repeated erosion.

43. **Area along State Highway 17:** Rapid runoff from the hills has dumped gravel and debris onto highway 17 and into yards located at the edge of the Chemung River Valley. Several structures have been installed to protect the road: a concrete ditch (that requires cleaning after major storms), piling, and rip rap.

### SHALLOW WATER TABLE

Groundwater flooding results from water below the surface of the ground that seeps through basement walls or backs up through basement drains. The shallow water table contributes to basement flooding and septic system failure in several developed areas in the Town of Elmira. Because groundwater levels are subject to natural fluctuations, these problems are not always apparent at the time a site is developed or when a home is purchased.

**PROBLEMS:**

44. **Groundwater flooding:** Areas with a shallow water table are scattered throughout the Town, particularly at the base of hills in both west Elmira and on East Hill.

### FLOOD WARNING

Flood warnings in the Town of Elmira are provided by the Chemung County Emergency Management Office, which obtains flood warning information from the Flood Warning Service of Steuben and Chemung Counties (operated by Environmental Emergency Services, Inc.) and from the National Weather Service. These warnings are based on a network of automated rain and river-level gauges, supplemented by additional observations and reports. The Town is in the process of revising and updating its emergency response plan.

Flood warnings for Chemung River flooding are based on a network of rainfall and river level gauges in the Chemung River Basin. The travel time of peak flows from the Chemung River gauge in Corning to the Chemung River gauge in Elmira is 4 to 5 hours. Greater warning times can be provided based on gauges on the three rivers that join upstream of Corning (average travel times from upstream gauges to Elmira range from 9 to 20 ½ hours), a network of rainfall gauges throughout the basin, and rainfall forecasts.

The areas expected to be inundated by various flood stages on the Chemung River are shown on River Stage Forecast Maps. These maps are used to identify areas requiring evacuation and to designate evacuation routes. River Stage Forecast Maps have been prepared for the Chemung River in the Town of Elmira. Similar maps were prepared for Newtown Creek, but cannot be used because the Newtown Creek stream gauge on which they are based is no longer operational.

Flood warnings for tributary streams are based on rain gauge data and rainfall forecasts by the National Weather Service. Automated rain gauges located in Big Flats, Catlin, and Erin provide
information about the rates and amounts of rainfall in the area. Data from these gauges are relayed by telemetry to the Flood Warning Service for Steuben and Chemung Counties and to the National Weather Service for use in preparing flood forecasts. Additional information can be provided by volunteer rain gauge readers.

PROBLEMS:
45. **Flash flooding**: The short steep tributary streams in the Town of Elmira are highly susceptible to flash flooding, which can occur suddenly with little or no lead time.

46. **Stream gauges**: There are no stream gauges or stream monitoring locations on the tributary streams that flow through the Town of Elmira. Of particular concern is the discontinued the Newtown Creek stream gauge in Elmira, without which the Newtown Creek Flood Stage Forecast Maps can no longer be used.

47. **Rain gauges**: A procedure for timely reporting of high rainfall rates and amounts by volunteer rain gauge readers in the Elmira area has not been established.

DEVELOPMENT TRENDS

The Town of Elmira is located west, north, and east of the City of Elmira. The hillside and valley areas of west Elmira are already extensively developed. Recent development has been concentrated primarily in upland sites of west Elmira. Increased drainage resulting from additional development in these areas has significant impacts downhill on the densely developed hillsides, particularly along Clark’s Glen Creek, Whirt’s Creek, and Beecher Creek. In addition, the rural East Hill area contains many sites that are suitable for development. Planned improvements to State Route 17 (to bring the highway up to interstate highway standards) will impact drainage in that area.

The 1998 zoning revisions for the Town of Elmira (Town of Elmira Zoning Ordinance, 1998) include a number of measures intended to reduce flood damages. A Conservation Zone in regulated floodways and other environmentally sensitive areas severely restricts development in these areas. Structures are required to be set back a minimum of 50 feet from all streambanks throughout the Town. Each zoning district has a specified maximum lot coverage for impervious surfaces. The ordinance specifies that “there shall be no net increase in the rate of stormwater run-off from a site post-development” and references specific design criteria. The Town also has a timber harvesting ordinance.

PROBLEMS:
48. **Stormwater management**: Although the new zoning ordinance and the timber harvesting ordinance have greatly improved stormwater management at logging and development sites, additional improvements are desired.

49. **Shallow water table**: The Town of Elmira building codes do not protect against the construction of basements below the seasonal high water table levels. Data documenting water table levels at undeveloped sites do not exist.

50. **Upper Goldsmith Creek**: The regulations restricting development in flood-prone areas...
along Goldsmith Creek are minimal. Although this creek has a history of flooding problems, the 100-year floodplain was not delineated for the upper areas of this stream. The zoning ordinance specifies that buildings be set back at least 50 feet from the streambank. Additional restrictions or protective measures may be warranted.