This hazard mitigation plan encompasses the Town of Erwin in Steuben County, New York. It excludes the portion of the Town of Erwin that is within the incorporated limits of the Village of Painted Post. 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.
<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
<th>page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1 – Executive Summary</td>
<td>1-1</td>
</tr>
<tr>
<td>Background</td>
<td>1-1</td>
</tr>
<tr>
<td>Planning Process</td>
<td>1-1</td>
</tr>
<tr>
<td>Risk Assessment</td>
<td>1-2</td>
</tr>
<tr>
<td>Mitigation Strategy</td>
<td>1-2</td>
</tr>
<tr>
<td>Implementation through Existing Programs</td>
<td>1-4</td>
</tr>
<tr>
<td>Proposed Mitigation Projects</td>
<td>1-6</td>
</tr>
<tr>
<td>Plan Maintenance</td>
<td>1-8</td>
</tr>
<tr>
<td>Section 2 – Background</td>
<td>2-1</td>
</tr>
<tr>
<td>Land Use and Assets</td>
<td>2-1</td>
</tr>
<tr>
<td>Critical Facilities</td>
<td>2-2</td>
</tr>
<tr>
<td>Development Trends</td>
<td>2-2</td>
</tr>
<tr>
<td>Hazard Mitigation Efforts</td>
<td></td>
</tr>
<tr>
<td>Section 3 – Planning Process</td>
<td>3-1</td>
</tr>
<tr>
<td>Flood Mitigation Planning</td>
<td>3-1</td>
</tr>
<tr>
<td>Project Impact</td>
<td>3-2</td>
</tr>
<tr>
<td>All Hazard Mitigation Planning</td>
<td>3-3</td>
</tr>
<tr>
<td>Public Involvement</td>
<td>3-4</td>
</tr>
<tr>
<td>Coordination with Agencies</td>
<td>3-6</td>
</tr>
<tr>
<td>Adoption of Plan</td>
<td>3-8</td>
</tr>
<tr>
<td>Section 4 – Risk Assessment</td>
<td>4-1</td>
</tr>
<tr>
<td>#1. Flood/Flash Flood</td>
<td>4-3</td>
</tr>
<tr>
<td>#2. Hazardous Material Released in Transit</td>
<td>4-8</td>
</tr>
<tr>
<td>#3. Water Supply Contamination</td>
<td>4-10</td>
</tr>
<tr>
<td>#4. Fire</td>
<td>4-12</td>
</tr>
<tr>
<td>#5. Severe Storm</td>
<td>4-14</td>
</tr>
<tr>
<td>#6. Petroleum Spill</td>
<td>4-17</td>
</tr>
<tr>
<td>#7. Utility Failure</td>
<td>4-19</td>
</tr>
<tr>
<td>#8. Ice Storm</td>
<td>4-20</td>
</tr>
<tr>
<td>#9. Hazardous Material Released from a Fixed Site</td>
<td>4-22</td>
</tr>
<tr>
<td>#10. Wildfire</td>
<td>4-25</td>
</tr>
<tr>
<td>#11. Ice Jam</td>
<td>4-26</td>
</tr>
<tr>
<td>#12. Terrorism</td>
<td>4-27</td>
</tr>
<tr>
<td>#13. Transportation Accident</td>
<td>4-29</td>
</tr>
</tbody>
</table>
Section 5 – Mitigation Strategy

Multi-Hazard Mitigation
Flood/Flash Flood
Hazardous Materials
Transportation Safety
Water Supply Contamination
Fire/Wildfire
Severe Weather
Utility Failure
Terrorism

Page 5-1

Section 6 – Implementation through Existing Programs

Multi-Hazard Mitigation
Flood/Flash Flood
Hazardous Materials
Transportation Safety
Water Supply Contamination
Severe Weather
Terrorism

Page 6-1

Section 7 – Proposed Mitigation Projects

Multi-Hazard Mitigation
Flood/Flash Flood
Hazardous Materials
Transportation Safety
Water Supply Contamination
Utility Failure

Page 7-1

Section 8 – Plan Maintenance

Page 8-1

Attachment A – Maps and Data

Page A-1

Attachment B – Planning Process Documentation

Page B-1
Attachment C – Assessment of Low Priority Hazards

#14. Dam Failure
#15. Earthquake
#16. Tornado
#17. Severe Winter Storm
#18. Drought
#19. Extreme Temperatures
#20. Explosion
#21. Air Contamination
#22. Structural Collapse
#23. Epidemic
#24. Radiological Release in Transit
#25. Civil Unrest
#26. Fuel Shortage
#27. Food Shortage
#28. Avalanche
#29. Radiological Release from a Fixed Site
Hazards Not Applicable

Attachment D – Flood Hazards and Problems

Riverine Flooding and Streambank Erosion
Drainage Problems
Shallow Water Table
Flood Warning
Development Trends
Hazardous Material Spills

Attachment E – Information Sources

Plans and Studies
Town Codes and Standards
Hazard Information
Hazard Mitigation Information
# REVISION HISTORY

<table>
<thead>
<tr>
<th>Revision Date</th>
<th>Pages Added or Replaced</th>
</tr>
</thead>
</table>

SECTION 1 – EXECUTIVE SUMMARY

The Town of Erwin Hazard Mitigation Action Plan includes resources and information to assist public and private sectors in the Town of Erwin 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 Erwin to apply for hazard mitigation grants that will assist with implementation of the proposed projects identified in this plan.

BACKGROUND

The Town of Erwin is a rapidly expanding community with industrial, commercial, and residential development. Since sustaining extensive flood damage in 1994 and 1996, the Town has been very proactive in mitigating flood hazards throughout the Town. Erwin established a formal hazard mitigation program in 1999, when the Town was designated a Project Impact Community. This program facilitates ongoing efforts to incorporate hazard mitigation measures into public and private sector operations.

PLANNING PROCESS

The Town of Erwin Hazard Mitigation Action Plan was developed as part of an ongoing hazard mitigation planning process in the Town of Erwin. Following flooding in 1996, the Town convened a series of meetings and implemented identified flood mitigation measures. This was followed by the formation of a joint Flood Mitigation Planning Committee with the Town of Campbell. In 1999, the committee completed a Flood Mitigation Action Plan, Town of Erwin and Town of Campbell. The Town of Erwin portion of this plan was updated in September 2001 and again in February 2002. Since 1999, public and private sectors within the Town of Erwin have participated in a Project Impact program that facilitates hazard mitigation planning and implementation. In 2002 and 2003, the information from these previous planning efforts was assembled into a single document and updated. The resulting plan is now called the Town of Erwin Hazard Mitigation Action Plan. This plan documents the Town of Erwin program for mitigating the risks from natural and man-made hazards.

Hazard mitigation in the Town of Erwin is accomplished by partnerships between public and private sector organizations. Participants in the hazard mitigation planning process include elected officials and staff from the Town of Erwin, representatives of fifteen local businesses,
emergency response personnel, numerous agencies (county, regional, state, and federal), and concerned citizens. Staff support for assembling and updating this plan was provided by Flood Mitigation Specialist from Southern Tier Central Regional Planning and Development Board.

**RISK ASSESSMENT**

The recommendations in the *Town of Erwin 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 thirteen 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
- Water supply contamination

**Moderately High Priority Hazards:**
- Fire
- Severe storm
- Petroleum spill
- Utility failure
- Ice storm
- Hazardous material released from a fixed site
- Wildfire
- Ice jam
- Terrorism
- Ice jam
- Transportation accident

**MITIGATION STRATEGY**

The overall purpose of the *Town of Erwin 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 Erwin. The *Town of Erwin 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.
• Eliminate contribution of runoff from new construction and land use changes 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 at facilities that store and/or use hazardous materials to minimize the risk of explosion or exposure to hazardous substances.

**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.

**Water Supply Contamination Goals**

• Protect public water supplies from contamination
• Monitor the quality of private well water and alleviate health risks.
• Ensure that onsite wastewater treatment systems (septic systems) function properly.
• Provide municipal sewer and/or water service to areas with chronic well water contamination problems.
Fire/Wildfire Goals

- Raise public awareness about fire safety.
- Ensure quick and effective response by fire departments to fires and wildfires.
- Construct new development in such a manner as to reduce the susceptibility to fire damage.

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.
- Protect against a water supply shortage in the Corning Area Aquifer.

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.

IMPLEMENTATION THROUGH EXISTING PROGRAMS

Some of the mitigation objectives for the Town of Erwin are already being implemented. Others can be incorporated into existing municipal operations and ongoing local programs. The Town of Erwin Hazard Mitigation Action Plan recommends that following high priority activities be implemented with existing or anticipated local resources.

Multi-Hazard Mitigation

Public Information
- Utilize direct mailings to Town residents
- Utilize direct mailings to businesses and schools
- Broadcast public service announcements
• Develop community emergency training program
• Disseminate hazard information on the internet
• Convene a public meeting to introduce Town’s Emergency Management Plan
• Encourage greater utilization of NOAA weather radios
• Develop emergency information place mats for local restaurants
• Disseminate hazard information at Town Hall

Emergency Services
• Review and update *Comprehensive Emergency Management Plan*
• Test off-site setup of flexible site command post
• Provide NOAA weather radios to public facilities
• Support Erwin Fire Council
• Support Environmental Emergency Services, Inc.
• Establish a badge/emergency access system

Preventive Measures
• Periodically review and revise community development plans and land use regulations
• Provide hazard mitigation training for Planning Board and Zoning Board of Appeals members

Flood/Flash Flood

Public Information
• Utilize direct mailing to owners of flood-prone property
• Support Chemung Basin River Trail

Emergency Services
• Install automated precipitation gauges in Meads Creek Watershed
• Develop rating curves for Meads Creek stream gauges
• Expand network of volunteer rain gauge readers

Preventive Measures
• Evaluate potential to establish new benchmarks
• Request updated Flood Insurance Rate Maps
• Inspect and maintain drainage ways
• Inspect and maintain the Cohocton River near the Robert Dann Drive Bridge

Natural Resource Protection
• Support efforts to restore and construct wetlands
• Encourage establishment and maintenance of vegetated riparian buffers
• Enforce Town of Erwin timber harvesting regulations
Property Protection
- Provide technical assistance for floodproofing measures
- Upgrade existing drainage structures
- Improve Community Rating System classification

Structural Solutions
- Improve drainage capacity at Brook Road and Fox Lane
- Encourage upgrading of the I-86 bridge over Meads Creek

Hazardous Materials
- Establish a hazardous material response team
- Provide hazardous material awareness training for Town Highway Department staff

Transportation Safety
- Support implementation of the Schuyler-Steuben Rural Transportation Needs Study recommendations
- Maintain communication with NYS Department of Transportation and County Highway Department
- Provide municipal personnel with defensive driving training

Water Supply Contamination
- Enhance safety of the Route 417 water line extension
- Enforce Aquifer Protection Overlay District regulations
- Encourage proper maintenance of onsite wastewater treatment systems

Severe Weather
- Provide brush pickup and drop-off services

Terrorism
- Assess the vulnerability of the Erwin water system to a terrorist attack

PROPOSED MITIGATION PROJECTS

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

Public Information
• Install and maintain local radio transmitters

Emergency Services
• Provide emergency response training for municipal officials
• Install and maintain a radio repeater tower

Preventive Measures
• Expand Geographic Information System (GIS) capability

Flood/Flash Flood

Public Information
• Provide site-specific packets of flood information (“flood audits”)

Emergency Services
• Provide swiftwater rescue training for fire departments
• Provide swiftwater rescue training for Town Highway Department
• Prepare flood stage forecast maps for Canisteo River
• Prepare flood stage forecast maps for Meads Creek

Preventive Measures
• Update in-town drainage study for Gang Mills area
• Map existing drainage easements

Natural Resource Protection
• Implement stream and road ditch stabilization projects

Property Protection
• Buyout properties on Mill Street Extension

Structural Solutions
• Conduct hydrologic evaluation of the Meads Creek Watershed

Hazardous Materials

• Establish a radon testing and education program
• Provide radon mitigation training

Transportation Safety

• Procure portable travel advisory signs
**Water Supply Contamination**

- Provide sewer and water service to Long Acres (Victory Highway/Pioneer Drive area)
- Provide sewer and water service to Coopers Plains
- Expand the wellhead/aquifer protection program

**Utility Failure**

- Purchase emergency generators for sewer lift stations
- Implement recommendations of the *Chemung River Valley Water Study*

**PLAN MAINTENANCE**

As an officially designated Project Impact Community, the Town of Erwin has made a long-term commitment to mitigating the impacts of disasters. The *Town of Erwin Hazard Mitigation Action Plan* is a tool that will enable the Town to become progressively more “disaster-resistant.” This plan is an active document that will be periodically reviewed, updated, and revised. The Project Impact Executive Committee, which is comprised of public and private sector members, is responsible for overseeing implementation and maintenance of this plan.
SECTION 2 – BACKGROUND

The Town of Erwin is a community of 7,227 residents (2000 census) located west of the City of Corning in southeastern Steuben County, NY. The daytime population of the Town is higher, due to industrial and commercial development. The Village of Painted Post is located within the Town of Erwin (with 1,842 Village residents), but is not included in this plan. The population of the Town of Erwin has increased 6.86% since the 1990 census (1990 census population 6,763). Of the 5,385 Town residents located outside of the Village of Painted Post, 25% are children (under 18 years old) and 17% are elderly (65 years old and over).

LAND USE AND ASSETS

The land area of the Town is 36 square miles. Erwin includes the confluences of the Canisteo, Tioga, and Cohocton Rivers, which join to form the Chemung River. Erwin is at the crossroads of major transportation routes (shown on the Transportation Infrastructure map in Attachment A): east-west Interstate 86 and north-south State Route 15 (future I-99). It also has two railroad lines and a major railroad switching yard. In addition to state and county roads, the Town has over 55 miles of local roads maintained by the Town Highway Department.

The distribution of land uses in the Town (based on property tax classifications) is shown on the Land Use map and table in Attachment A. The Town is host to a variety of industrial, commercial, and residential developments, including two Fortune 500 Companies (Corning Incorporated and Dresser Rand), four other major industrial employers, over 50 stores, an eight-screen movie theater, two nursing homes, and two schools. In addition, there are 2,317 housing units in the Town of Erwin (excluding the Village of Painted Post, 2000 census). Much of this development is concentrated along the floodplains of the rivers and in the Gang Mills area. The Gang Mills area has experienced rapid growth in industrial, commercial, and residential development in recent years. Many upland areas in the Town remain sparsely developed, with steep wooded areas and scattered farms and residences.

The Town has an equalized assessed value of over $376 million. Almost $300 million of this value is in buildings and the remainder in land. The distribution of these assets over the various property classes is shown in the Town of Erwin Assets table in Attachment A. Approximately 14% of the assessed value within the Town is industrial, 15% commercial, 58% residential, and the remainder agricultural, vacant land, recreation/entertainment, community services, public services, and wild/forested/conservation lands/public parks.

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 23% of the Town’s residential structures (382 structures) have been built since 1990. About 20% were built prior to 1950, of which 4% were built before 1900.
In the late 1990’s the Town of Erwin experienced a period of vast economic growth. Between 1997 and 2000, more than $300 million in corporate investments were made in the Town. More than $11.5 million in infrastructure improvements were also made, including road construction, stormwater management facilities, water supply and storage, and wastewater treatment.

**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 Erwin 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 Erwin has experienced rapid growth in industrial, commercial, and residential development in recent years. Although this rate of development has declined with the recent economic downturn, additional residential and commercial development is anticipated.

The *Town of Erwin Comprehensive Master Plan 2010* was adopted in 1993. Since that time, the Town’s population has grown faster than had been anticipated and many of the development opportunities identified in the plan have been implemented. In June 2000, the *Town of Erwin Corridor Management Plan* was adopted for the area around the I-86/Route 15 interchange. A build-out analysis of the corridor area identified 57 acres of vacant “buildable” land (based on the town’s zoning ordinance). If developed to its full potential under existing zoning, over 600,000 square feet of commercial space and eleven housing units could be built in the corridor area. The Town Board adopted the *Town of Erwin Comprehensive Plan 2010 Update* on February 11, 2003. This plan identified a significant buildable acreage for future medium density residential development in the Jones Road area, south of Gang Mills. This area has 918 acres of “buildable” land (vacant or agricultural land with slopes less than 25%, that is not classified as floodplain or wetland), which could accommodate more than 3,000 residential units.

**HAZARD MITIGATION EFFORTS**

The *Town of Erwin 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 Erwin and Town of Campbell that was prepared in 1998-99 and updated in 2001 and 2002. This plan also incorporates the hazard analysis and priorities established as part of the Town of Erwin Project Impact program.

**National Flood Insurance Program**

Town of Erwin joined the Regular Phase of the National Flood Insurance Program in 1980. 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 Town of Erwin updated their regulations in 2001 to require that structures be elevated two feet above the predicted height of 100-year flooding (two feet higher than the level of protection required by the National Flood Insurance Program). The floodplain development standards also protect neighboring properties from increased flood damage that might result from new development.

Flood insurance can be purchased for any building in the Town of Erwin. On February 28, 2003, there were 132 flood insurance policies in the Town (down from 143 on March 3, 1999). The Town estimates that these insurance policies only cover about 34% of the structures in the regulatory floodplain. The value of the property covered by these policies is $10.8 million. Flood insurance claims since 1978 have totaled $135,585 (for 35 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. One property in the Town of Erwin is classified by the National Flood Insurance Program as a “repetitive loss property” (due to two or more flood insurance claims within any ten-year period). The owner of this property has repeatedly refused offers from the Town to seek funding for property acquisition.

In 1991, the Town of Erwin 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**

The Town of Erwin has undertaken extensive efforts to resolve flooding, streambank erosion, and drainage problems. When road, shoulder, culvert, and road ditch repairs have been necessary, every effort has been made to address the problem rather than just repairing the damage. The County Soil and Water Conservation District has worked closely with the Town and property owners to stabilize many erosion sites with rock rip-rap and natural stream design projects. The Town has also worked closely with upstream municipalities to address flooding and erosion problems. These corrective and preventive measures are credited with reducing the
extent and severity of damages from recent storm events.

In 1996, the Town of Erwin established a Drainage (Stream Management) District. The boundaries of this District encompass all but one hilltop property in the Town. The purpose of the District is to facilitate the implementation of river and stream work needed to mitigate flooding problems. Town Highway Department personnel implement the work of the Drainage (Stream Management) District, which is funded by a property tax assessment of 3 cents per $1,000. Since establishment of this district, channel maintenance work has been conducted in several streams and wetlands.

The Town of Erwin requires development projects to meet engineering standards for stormwater management as part of site plan review. The developer must grant the Town an easement to access any newly built stormwater drainage facility (giving the Town the right, but not the responsibility, to conduct maintenance or emergency operations). The Erwin Zoning Commission has incorporated additional stormwater management and sediment control provisions into the Town Zoning Law. Local regulations require that timber harvesters address stormwater management and erosion control on their project sites.

The most recent Town of Erwin zoning update (adopted in December 2003) includes a Stream Corridor Overlay District that provides additional standards for development within stream corridors and areas adjacent to wetlands. The Town acquired the shape files for the National Wetland Inventory and included this information in the Town’s Geographic Information System (GIS) computer database. This wetland information is now available for land-use planning and during review of development proposals, with the objective of preserving and enhancing wetland areas. The Town’s 2004 planning project includes development of a green infrastructure strategy and a Jones Road area coordinated build-out plan.

**Early Warning of Severe Weather and Flooding**

The Town of Erwin makes an annual financial contribution to Environmental Emergency Services, Inc. and is represented on the Board of Directors. 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. Recent expansion of this system includes two stream gauges in Meads Creek, upstream of the Town of Erwin. These new gauges improved warning times for flooding of the Victory Highway area on July 22, 2003.

In 2001, the National Weather Service recognized Steuben County as a Storm Ready county. This designation formally acknowledged the County’s proactive approach to improving the local response to severe weather and flooding. In order to qualify for this designation, a community must:

- Establish a 24-hour warning point and emergency operations center
- Have more than one way to receive severe weather warnings and forecasts and to alert the public
• Create a system that monitors weather conditions locally
• Promote the importance of public readiness through community seminars
• Develop a formal hazardous weather plan, which includes training of severe weather spotters and holding emergency exercises.

Two NOAA Weather Radio broadcast towers were established in Steuben County in 2002, providing the Erwin area with a warning system for severe weather, flooding, and other hazards.

Project Impact

As an officially designated Project Impact Community, the Town of Erwin is dedicated to reducing the loss of life and property by becoming disaster-resistant. In 1999, a Project Impact Steering Committee was formed of community leaders and emergency responders to determine methods by which resistance was to be achieved. This committee is co-chaired by the Town of Erwin supervisor and a business leader from Corning Incorporated. Erwin has used the Project Impact program to combine disaster resistance efforts with economic development. The Project Impact philosophy has been incorporated into the culture of both the Town government and the industries within the Town in order to make Erwin a more livable, sustainable community.

Principle accomplishments of the Project Impact program include:
• The NYS Department of Transportation (DOT) began construction on the I-86/Route 15 interchange in 2003, with project completion scheduled for 2006. Project Impact contributed $20,000 to this project. The hazards identified by the Project Impact planning process were an important catalyst in persuading DOT to schedule and complete this project earlier than their initial 2013 completion date.
• The Town of Erwin Comprehensive Emergency Management Plan was developed by the Emergency Services Committee, working with the State and County Emergency Management Offices. The Erwin Town Board adopted the final plan on May 8, 2001. The plan was subsequently reviewed and revised in 2003 and 2004.
• The Emergency Services Committee developed a Critical Communication Information Card, which was printed and distributed to key personnel for use during an emergency.
• Two NOAA Weather Radio broadcast towers were established in Steuben County in 2002, providing the Erwin area with a warning system for severe weather, flooding, and other hazards. Project Impact contributed $10,000 to this $70,000 project.
• The Project Impact Committee initiated an educational public outreach campaign on how to prepare for and respond to any type of disaster within the Town of Erwin. This program utilizes educational materials published by the National Weather Service and the American Red Cross.
• The Town of Erwin has purchased portable communications equipment to enable establishment of a “flexible site command post” to coordinate emergency operations.
• Emergency generators were purchased to provide backup power for the Erwin water supply and sewer systems.
• The Town of Erwin built a second bridge over the Cohocton River connecting Canada Road and Victory Highway, thereby providing a second access to the hamlet of Gang Mills in the
event that the primary river crossing is closed.

In May 2001, the Town appointed a Project Impact Coordinator to facilitate implementation of the recommended mitigation measures. The Project Impact Executive Committee and subcommittees continue to meet to oversee and assist with implementation efforts. The Project Impact Executive Committee, in coordination with the Steuben County Emergency Services Director, and the Project Impact Coordinator, will:

- identify potential hazards in the Town and outside of the Town boundaries that could affect the Town,
- determine the probable impact each of those hazards could have on people and property, and
- delineate the geographic areas affected by potential hazards, plot them on maps, and designate them as hazard areas.

**Water Supply Protection**

The Town of Erwin has taken a number of measures to protect their municipal water supplies. Three Aquifer Protection Overlay Districts are incorporated into the Town’s zoning laws to regulate land use within the recharge areas. In addition, the Town has established well closure procedures that require proper closure of existing wells as a condition for any new connection to the municipal water system. A Vulnerability Assessment has been conducted for the water supply systems and a Contingency Plan has been developed for each. Any identified deficiencies are being addressed. A sewer pretreatment program has been established for significant industrial users.

In order to proactively address water supply concerns, the Town of Erwin chairs the Chemung River Valley Water Study Committee. The communities represented on this committee are the Towns of Erwin and Corning, City of Corning, and Villages of Painted Post and Riverside. The *Chemung River Valley Water Study* was completed in April 2003. This study includes (1) an assessment of alternate administrative structures to meet the region’s water supply needs, (2) a groundwater model that can be used as a framework for modeling of source protection issues, (3) an assessment of a “safe yield” for the Corning Area Aquifer, and (4) a preliminary drought management plan, with recommended triggers for local regulatory and non-regulatory responses. The group plans to prepare a drought emergency plan and a drought management ordinance for the five municipalities.

**Transportation Safety**

The *Schuyler-Steuben Rural Transportation Needs Study* was completed on October 4, 2002. One of the primary recommendations of the study is to “promote appropriate transportation safety activities.” The report identified twelve region-wide transportation safety tasks and four transportation problems in the Town of Erwin. A two-county rural transportation advisory committee has been formed to implement the recommendations of the needs study.
**All-Hazard Mitigation and Response**

The three fire departments serving the Town of Erwin have formed the Erwin Fire Council to coordinate and enhance the emergency response capability within the Town. The Fire Council currently consists of the Fire Chief and Commissioner of each department, a Town Councilman, and a Fire Council Facilitator (hired as a consultant). It is anticipated that this group will eventually be expanded to include representatives from the emergency medical system, County Emergency Management Office, police, highway departments, sewer system, and municipal water system. The Fire Council is addressing issues such as equipment needs, tactical coordination among the departments, operating procedures, and drills.

In January 2003, the Town of Erwin 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’s emergency response plan outlines the procedures and cites the authority to guide action in the event of a major emergency or disaster. In 2000, the Project Impact Committee strongly recommended that this plan be revised and updated. The Erwin Town Board adopted the revised *Town of Erwin Comprehensive Emergency Management Plan* on May 8, 2001. It was subsequently revised and updated in 2003. This plan includes procedures for risk reduction, response, and recovery.
SECTION 3 – PLANNING PROCESS

The *Town of Erwin Hazard Mitigation Action Plan* was developed as part of an ongoing hazard mitigation planning process in the Town of Erwin. Following flooding in 1996, the Town convened a series of meetings and implemented identified flood mitigation measures. This was followed by the formation of a joint Flood Mitigation Planning Committee with the Town of Campbell. In 1999, the committee completed a *Flood Mitigation Action Plan, Town of Erwin and Town of Campbell*, which was adopted by the Erwin Town Board in November 1999. The Town of Erwin portion of this plan was updated in September 2001 and again in February 2002. The Town Board adopted both revisions. Since 1999, public and private sectors within the Town of Erwin have participated in a Project Impact program that facilitates hazard mitigation planning and implementation. In 2002 and 2003, the information from these planning efforts was assembled into a single document and updated. The resulting plan is now called the *Town of Erwin Hazard Mitigation Action Plan*.

The *Town of Erwin 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 Erwin Hazard Mitigation Action Plan* is an active document that will be periodically reviewed, updated, and revised.

FLOOD MITIGATION PLANNING

In order to enhance cooperation on mutual flooding problems, the Towns of Erwin and Campbell developed a multi-jurisdictional *Flood Mitigation Action Plan, Town of Erwin and Town of Campbell*. The Town of Erwin representatives on the Erwin/Campbell Flood Mitigation Planning Committee included the Town Manager, two members of the Town Board, the Highway Superintendent, and the Code Enforcement Officer. Additional participants included the County Emergency Management Office and County Soil and Water Conservation District. Staff support for development of the *Flood Mitigation Action Plan, Town of Erwin and Town of Campbell* 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:

- **7/9/98: 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. Define the scope of the planning process.
• 7/27/98: **Assess hazards and problems:** Update on outreach activities. Compile information about flood hazards and flood problems. Mark flood problem areas on a map showing designated 100-year and 500-year floodplains.

• 8/18/98: **Assess hazards and problems:** Update on public involvement activities. Review hazard and problem information compiled from previous meeting. Compile additional information.

• 9/17/98: **Set flood damage reduction goals:** Review other community goals. Discuss the committee’s vision of how flooding issues can be addressed and future damages prevented. Compile a list of flood damage reduction goals for the Towns of Erwin and Campbell.

• 11/5/98: **Evaluate Flood Solutions:** Review and revise the proposed flood mitigation goals. Review Flood Solutions Worksheet – a comprehensive list of possible activities for reducing flood damages. Identify the activities that are applicable to the resolution of flooding problems in the Towns of Erwin and Campbell.

• 12/3/98: **Prepare an action plan:** Review maps 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.

• 12/16/98: **Prepare an action plan:** Complete the action plan. Recommend post-disaster mitigation policies and procedures. Develop a strategy for implementation, evaluation, and revision of the Plan. Recommendation for public review of the draft Plan.

• 1/26/99: **Public information meeting:** Solicit public input on the draft plan.

The Town of Erwin members of the Flood Mitigation Planning Committee met again on July 2001 to review and update the portions of the *Flood Mitigation Action Plan* pertaining to the Town of Erwin. Subsequent telephone contacts were made to obtain input from those unable to attend the meeting. In February 2002, the plan was again updated to incorporate an additional action item relating to inspection and maintenance of the Cohocton River near the proposed Robert Dann Drive bridge.

**PROJECT IMPACT**

The Town of Erwin established a formal hazard mitigation program in 1999, when the Town was designated a Project Impact Community. A Project Impact Committee was formed with municipal representatives and community leaders. The Committee is co-chaired by the Town supervisor and a business leader from Corning Incorporated. Early in the Project Impact process, the Steering Committee conducted a comprehensive hazard analysis, which identified hazardous material in transit, terrorism, and flooding as the top priority hazards. Based on this assessment, the following subcommittees were formed:

- **Flood/Flash Flood Committee** – ice jams, dam failure, flood prevention/warning
- **Transportation Committee** – transportation accident, hazardous material transportation, oil spill, radiological spill
• Severe Weather Committee – ice storm, winter storm, extreme temperatures, power failure, fuel shortage, tornado, earthquake, landslide, wind storm
• Emergency Services Committee – hazardous material releases from fixed sites, fire, wildfire, explosion, epidemic, Y2K, civil unrest, terrorism, police/fire/emergency service coverage
• Water Source and Supply Committee – drought, extreme heat, wellhead protection

Each subcommittee identified and prioritized concerns and priorities for each group of hazards. On October 28, 1999, the Project Impact Steering Committee voted to focus on nine top priority hazards. The subcommittees then recommended mitigation measures and educational needs for each of the high priority hazards. Based on these committee recommendations, the Steering Committee developed a prioritized list of 14 mitigation activities that support the Town’s goal of becoming a disaster-resistant community.

A Project Impact Signing Ceremony was held on October 20, 2000, at which a Memorandum of Agreement was signed by thirty Project Impact partners and sponsors. Presenters at this public event included NYS Assemblyman Bacalles, NYS Senator Kuhl, Director of the NY State Emergency Management Office, the Region II Director of the Federal Emergency Management Agency, and a representative of U.S. Congressman Houghton. These dignitaries commended the Town for integrating the growth of local businesses with the Town’s overall mitigation and planning efforts.

In May 2001, the Town appointed a Project Impact Coordinator to facilitate implementation of the recommended mitigation measures. The Project Impact Executive Committee and subcommittees continue to meet to oversee and assist with implementation efforts.

**ALL HAZARD MITIGATION PLANNING**

In 2002 and 2003, members of the Project Impact Executive Committee participated in efforts to compile information from previous planning efforts into a *Town of Erwin Hazard Mitigation Action Plan*. The members of this committee are: the Town Supervisor (Project Impact Co-chair), a Corning Incorporated executive (Project Impact Co-chair), Town Manager, Project Impact Coordinator/Code Enforcement Officer, Highway Superintendent, Administrative Assistant, Steuben County Director of Emergency Services, Steuben County Deputy Director of Emergency Services, NY State Emergency Management Office Regional Coordinator, President of Hunt Engineers and Architects, Forest View/Gang Mills Fire Chief, and a resident. 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.

• **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.

- **8/5/03: Hazard analysis:** The Steuben County Emergency Management Office facilitated a joint hazard analysis for nine Corning area municipalities using the HAZNY computer program developed by the NY State Emergency Management Office.

- **8/18/03: Prepare an action plan:** Prepare a mitigation action plan that includes measures that will be implemented through existing programs and proposed projects for which additional resources are needed.

- **10/30/03: Public information meeting:** Solicit public input on the draft plan.

**PUBLIC INVOLVEMENT**

The chronic nature of flooding problems in the Town of Erwin has led to frequent interactions between residents, local businesses, and municipal officials concerning water management issues. This public input has occurred at Town Board meetings, Planning Board meetings, public meetings, and through a variety of other forums. Hundreds of people attended a public meeting to address flooding problems on November 18, 1996. The Town’s efforts to alleviate flooding problems were presented at this meeting. The public provided ample feedback concerning the need to address flooding problems at numerous specific problem areas. A survey of flood damages was conducted in the Long Acres area of Erwin in 1997 to support a grant application for a project in Meads Creek. The problems and potential solutions arising from these ongoing interactions were incorporated into this flood mitigation planning process.

Additional public input was sought throughout this planning process. At the beginning of the flood mitigation planning process, letters were sent to the owners of five of the Town’s most flood-prone houses, two flood-prone businesses, and the managers of two flood-prone mobile home parks. The responses received were incorporated into the preparation of this Plan. Additional publicity was obtained through a newsletter article in the 1998 Annual Newsletter of the Steuben County Soil and Water Conservation District, which is distributed throughout the County (clipping in Attachment B). 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.

A draft of Flood Mitigation Action Plan, Town of Erwin and Town of Campbell was presented at a public information meeting on January 26, 1999. This meeting was publicized in two local newspapers, on local television news, and by flier. Presentations were made on the history of flood mitigation measures in the two Towns, a description of the planning process, and highlights of the proposed Action Items. This was followed by a discussion of flooding issues, concerns, and possible measures to alleviate flooding problems. A large-format copy of the Flood Hazard
and Problem 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 asked a number of questions. The impact of timber harvesting on drainage was discussed and Town of Campbell officials indicated that they might act on this issue more quickly than is indicated in Action Item #14. No changes to the Plan were recommended. Both television and newspaper journalists attended this meeting and provided press coverage. The resulting newspaper article is included in Attachment B.

The Town of Erwin Project Impact program is built on collaboration between the public and private sectors, which has advanced strong community partnerships. One of the two co-chairs is a senior executive from Corning Incorporated (the leading industry in the Corning area, with several facilities in the Town of Erwin). Numerous other local businesses serve on the Erwin Project Impact Steering Committee and/or subcommittees. These include:

- Big K K-Mart – Steering Committee; Flood/Flash Flood Committee
- Corning Enterprises – Steering Committee; Transportation Committee
- Corning Incorporated – Erwin Project Impact Co-chairman; Executive Committee; Steering Committee; Severe Weather Committee Chairperson; Transportation Committee Chairperson; Water Source and Supply Committee
- Corning Natural Gas Corporation – Steering Committee; Severe Weather Committee
- Dresser Rand Corporation – Steering Committee; Transportation Committee
- First Heritage Federal Credit Union – Steering Committee
- Hunt Engineers & Architects – Steering Committee; Water Source and Supply Committee Chairperson
- New York State Electric & Gas Corporation – Steering Committee; Severe Weather Committee
- Norfolk Southern Corporation – Steering Committee; Transportation Committee
- Painted Post Car Mart – Flood/Flash Flood Committee
- Sear Brown Group engineers – Steering Committee; Transportation Committee
- Sprague Insurance – Steering Committee; Severe Weather Committee
- Star-Gazette newspaper – Steering Committee
- Three Rivers Development Foundation – Steering Committee
- WENY TV – Steering Committee; Severe Weather Committee

The public and press were invited to the Project Impact signing ceremony on October 20, 2000. Local participation and press coverage of this event were exceptional. An article about the Town’s Project Impact program published in the STC Region Today newsletter is included in Attachment B.

A draft of the *Town of Erwin Hazard Mitigation Action Plan* was presented at a public information meeting on October 30, 2003. This meeting was publicized in the local newspaper (clipping in Attachment B), on a local radio station, notices posted in public areas (copy in Attachment B), direct mailing (to municipal officials, agency personnel, and elected officials),
and by word of mouth. Each participant at the public meeting received a copy of the Executive Summary of the draft plan. The Town Supervisor led an informal discussion about hazard mitigation, Project Impact, and the draft hazard mitigation plan. Questions were raised about improvements to Meads Creek, emergency generators for the public water system (subsequently purchased), the Town’s Aquifer Protection Overlay District, contamination of private well water, standards for onsite wastewater treatment systems, and other issues. A resident suggested that the Town consider a requirement that septic systems be periodically pumped and inspected. In response to this suggestion, the Town will investigate the potential options and expenses for an expanded Town role in the maintenance of privately owned septic systems. This task was added to an existing action item in the draft plan, which is now called “encourage proper maintenance of onsite wastewater treatment systems.” Support was expressed for extension of sewer and water services to Long Acres and Coopers Plains. Both projects are included in the plan.

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 Erwin 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 have been actively involved in development of the Town’s flood mitigation plan, the Project Impact program, and development of this all hazard mitigation plan. Personnel from numerous public 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:

- **Steuben County Emergency Management Office** – served on the Project Impact Executive Committee, Steering Committee, Flood/Flash Flood Committee, Severe Weather Committee, and Emergency Services Committee; attended flood mitigation planning committee meetings; reviewed minutes and draft text; met separately with the plan facilitator to provide risk assessment information and mitigation strategy recommendations; facilitated hazardous analysis workshop for Corning area municipalities; answered numerous questions

- **Steuben County Soil & Water Conservation District** – provided information about channel stabilization and flood mitigation; reviewed minutes and draft text; responded to questions; served on Project Impact Steering Committee and Flood/Flash Flood Committee

- **Steuben County Planning Department (County Hazard Mitigation Coordinator)** – reviewed minutes and draft text; served on Project Impact Steering Committee and Water Source and Supply Committee; answered questions

- **Steuben County Public Works Department** – was notified of the flood mitigation planning process and the hazard mitigation planning process; answered questions

- **Steuben County E-911 Services** – served on Project Impact Steering Committee
• **Steuben County Sheriff’s Department** – served on Project Impact Steering Committee, Transportation Committee, and Emergency Services Committee

• **Steuben County Legislature** – Legislator representing the Town of Erwin and the Chairman of the County Legislature served on Project Impact Steering Committee

• **Village of Painted Post** – Mayor served on Project Impact Steering Committee and Emergency Services Committee

• **Forest-View/Gang Mills Fire Department** – served on Project Impact Steering Committee; chaired Project Impact Emergency Services Committee

• **Coopers Plains-Long Acres Fire Department** – participated in Project Impact program

• **Village of Painted Post Fire Department** – participated in Project Impact program

• **Rural Metro Ambulance Service** – served on Project Impact Steering Committee and Emergency Services Committee; chaired Project Impact Transportation Committee

• **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; served on Project Impact Steering Committee and Emergency Services Committee

• **Chemung Basin Flood Warning Service** – served on Project Impact Flood/Flash Flood Committee

• **Corning-Painted Post School District** – served on Project Impact Steering Committee, Transportation Committee, and Emergency Services Committee

• **Southern Tier Central Regional Planning and Development Board** – facilitated development of both the flood mitigation plan and the all hazard mitigation plan; served on the Project Impact Steering Committee; chaired the Project Impact Flood/Flash Flood Committee

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

• **New York State Legislature** – State Assemblyman served on Project Impact Steering Committee and Water Source and Supply Committee; State Senator served on Project Impact Steering Committee

• **New York State Emergency Management Office** – served on Project Impact Executive Committee, Steering Committee, and Water Source and Supply Committee; reviewed minutes and draft text; 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 Police** – served on Project Impact Steering Committee and Emergency Services Committee

• **New York State Department of Environmental Conservation, Regional Flood Control Engineer** – reviewed minutes and draft text; provided information about flooding and ice jams; responded to questions; served on Project Impact Steering Committee and Flood/Flash Flood Committee

• **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; served on Project Impact Transportation Committee
• New York State Department of Environmental Conservation, Forest Ranger – served on Project Impact Emergency Services Committee
• New York State Department of Transportation – served on Project Impact Steering Committee, Flood/Flash Flood Committee, Transportation Committee, and Severe Weather Committee
• United States Congress – Congressman’s office represented on Project Impact Steering Committee
• Federal Emergency Management Agency – reviewed and approved *Flood Mitigation Action Plan, Town of Erwin*; served on Project Impact Steering Committee
• National Weather Service – provided statistical information about past weather hazards; responded to questions
• USDA Natural Resources Conservation Service – provided information for the flood mitigation planning process

**ADOPTION OF PLAN**

This plan and each subsequent revision will be presented to the Erwin 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 Erwin was conducted using the HAZNY (Hazard New York) 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 NY State Emergency Management Office facilitated a HAZNY assessment with the Erwin Project Impact Committee on June 14, 1999. The group evaluated 26 hazards that can potentially impact the Town of Erwin and rated them as follows (with the numerical scores derived from the HAZNY analysis).

<table>
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<tr>
<th>High Hazards:</th>
<th>Hazardous Materials in Transit 309.5</th>
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<tbody>
<tr>
<td></td>
<td>Terrorism 303.7</td>
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<td>Flood 301.8</td>
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<tr>
<th>Moderately High Hazards:</th>
<th>Power Failure 297.8</th>
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<tr>
<td></td>
<td>Flash Flood 294.8</td>
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<tr>
<td></td>
<td>Oil Spill 294.8</td>
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<td>Ice Storm 283.2</td>
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<td>Fire 274.5</td>
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<td>Wildfire 272.2</td>
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<td>Explosion 268.5</td>
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<td>Ice Jam 256.8</td>
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<td>Transportation Accident 255.2</td>
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<td></td>
<td>Tornado 250.8</td>
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<td></td>
<td>Severe Winter Storm 237.2</td>
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<td></td>
<td>Dam Failure 235.8</td>
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<td></td>
<td>Drought 221.8</td>
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<td>Windstorm 215.2</td>
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<tr>
<th>Moderately Low Hazards:</th>
<th>Hazardous Materials at Fixed Site 186.8</th>
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<tbody>
<tr>
<td></td>
<td>Earthquake 179.2</td>
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<tr>
<td></td>
<td>Epidemic 168.2</td>
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<tr>
<td></td>
<td>Extreme Temperatures 165.5</td>
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<td></td>
<td>Water Supply Contamination or Failure 157.5</td>
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<td></td>
<td>Fuel Shortage 152.2</td>
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<td></td>
<td>Radiological in Transit 136.5</td>
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<tr>
<td></td>
<td>Civil Unrest 117.5</td>
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<td>Landslide 117.2</td>
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</table>

Following this analysis five Project Impact Subcommittees compiled additional information and
recommendations concerning the top ranked hazards. On October 28, 1999, the Project Impact Steering Committee voted to focus on the following top priority hazards:

1 – Transit block at the Route 15 bridge over the Cohocton River (high risk due to the lack of an alternate river crossing location, the potential to isolate Gang Mills from emergency medical services, and the proximity to Village of Painted Post business area)

2 – Well-head protection (proactive measure to protect public water supply wells from contamination)

3 – Hazardous material accident from a fixed or mobile site (high risk of injury and/or death)

4 – Cohocton River flooding (floodplain development includes Coopers Plains, Victory Highway, Long Acres, Canada Road, and a railroad; flooding affects transportation, houses, residential wells, residential septic systems, and businesses)

5/6 – Meads Creek flooding (flood-prone development includes Interstate 86/Route 15, Victory Highway, Long Acres, and part of Coopers Plains; flooding affects local and regional transportation, houses, residential wells, residential septic systems, and businesses)

5/6 – Ice storm or heavy snow (high probability of occurrence; impact could be devastating to the Town’s residents and the economy)

7 – Power failure (the Erwin municipal water systems and most private systems depend on pumps; backup power is imperative to keep critical systems in operation during a prolonged electrical outage)

8 – Potential for development within 100-year floodplain and near streambanks (development pressures may lead to increased utilization of areas prone to flooding and streambank erosion)

9 – Canisteo and Tioga River flooding (flooding threatens industry, a municipal well house, houses, Route 417, local roads, railroads, farmland, and a golf course)

An updated hazard analysis was facilitated by the Steuben County Emergency Management Office for nine municipalities in the Corning area (Towns of Erwin, Corning, Lindley, Caton, and Hornby; Villages of Painted Post, Riverside, and South Corning; and City of Corning) on August 5, 2003. Elected officials, local staff, and emergency response personnel evaluated 27 hazards using the HAZNY analysis procedures. In addition, the Steuben County rankings for Tornado and Structural Collapse are included in the following ratings. These hazard ratings were used as the basis for prioritizing hazards in this mitigation plan.

- **High Hazards:**
  - Flood/flash flood: 394.0
  - Hazardous material – in transit: 374.3
  - Water supply contamination: 355.8

- **Moderately High Hazards:**
  - Fire: 308.5
  - Severe storm: 307.8
  - Oil spill: 305.8
  - Utility failure: 302.2
  - Ice storm: 301.8
  - Hazardous material – fixed site: 301.3
  - Wildfire: 287.2
Ice jam 272.2
Terrorism 271.0
Transportation accident 255.8

Moderately Low Hazards:
- Dam failure 237.5
- Earthquake 235.8
- Tornado 234.2
- Severe winter storm 233.5
- Drought 215.2
- Extreme temperatures 210.2
- Explosion 202.5
- Air contamination 196.3
- Structural Collapse 179.2
- Epidemic 179.0

Low Hazards:
- Radiological – in transit 158.2
- Civil unrest 146.5
- Fuel shortage 136.5
- Food shortage 125.8
- Avalanche 125.8
- Radiological – fixed site 123.8

The following assessment evaluates the risks associated with each hazard that was given a high or moderately high ranking in the Town of Erwin (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 Erwin 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:** Four days to one week
Incident stabilization: More than two weeks of overtime emergency operations
Potential impact: Serious injury or death is likely in extremely 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 in the Chemung River watershed about every 20 years. The National Weather Service has documented 29 flooding events in Steuben 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: Flood of record for the Cohocton River gauge near Campbell and the Canisteo River gauge at Arkport. A complex of thunderstorms produced flash flooding throughout south central New York and northern Pennsylvania. An estimated 12 inches of rain fell in the upper Meads Creek watershed in 9 hours. More than forty deaths were recorded. Damages ran in the hundreds of millions of dollars.
- May 1946: Intense rainfall on previously saturated ground 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 levees and floodwalls. 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. Damages from this flood led to construction of the Tioga, Hammond, and Cowanesque Dams upstream of Erwin in the Tioga River Watershed and construction of the Beartown Diversion and levee system in the Gang Mills area of Erwin.
- September 1975, Tropical Storm Eloise: Heavy rain from the inland remnants of Hurricane Eloise caused another river flood that damaged and destroyed numerous buildings.
- 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 southeastern Steuben 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. Flood damage surveys in the areas of Erwin flooded by Meads Creek documented $1,867,717 in flood damages. (Forty-five residents reported flood damages to single-family homes totaling $57,352. Not all residents known to have sustained damage responded to the survey. Two mobile home parks reported flood damages totaling $97,000. Four businesses reported flood damages and inventory losses totaling $1,713,365. Thirteen additional businesses lost revenues due to closure.) In addition, the stream maintenance needs in Meads Creek were estimated to cost $100,000.

• November 1996: Heavy rain caused flash flooding that damaged buildings and washed out roads. Meads Creek flooded again before stream maintenance from the January flood was completed. Flood damage surveys in the areas of Erwin flooded by Meads Creek documented $4,577,315 in flood damages. (Forty-nine residents reported flood damages to single-family homes totaling $287,418. Not all residents known to have sustained damage responded to the survey. Three mobile home parks reported flood damages totaling $323,000. Four businesses reported flood damages and inventory losses totaling $3,966,897. Thirteen additional businesses lost revenues due to closure.) In addition, the total estimated stream damages were $707,030. (Sediment and debris removal funded by FEMA totaled $673,630. Riprap repair cost about $12,000. Streambank stabilization projects cost about $21,400.)

• A localized thunderstorm in May 2002 dropped an estimated 3 inches of rain in ¾ hour in a residential area of Gang Mills. The intensity of this storm overwhelmed local drainage systems, causing flooding, erosion, and sediment deposition.

• July 22, 2003: A system of thunderstorms caused localized heavy rainfall in parts of Steuben and Schuyler Counties, including the Meads Creek watershed. The resulting flood damages in the Town of Erwin included a business and a mobile home park located near Meads Creek. Both of these areas were evacuated. The community water supply for the mobile home park was contaminated. State Route 415 and the westbound lane of Interstate 86 were closed at Meads Creek.

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 2.9 flood events per year in Steuben County since 1993. The frequency of flooding in the Town of Erwin is somewhat lower, since some of these events were local occurrences impacting other parts of the county. However, major river flooding, flash flooding, or urban flooding does occur in the Town of Erwin 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 Erwin. 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. Approximately 500 buildings in the Town of Erwin 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). More than 100 of these at risk structures are located outside of the area mapped as 100-year floodplain, but are threatened by small stream flooding, streambank erosion, urban flooding, or groundwater flooding of basements. Many additional structures are located within the 500-year floodplain and in areas protected by flood control levees. In recent years, the Town of Erwin has invested in numerous projects to stabilize streams, alleviate drainage problems, and mitigate flood risks. As a result, some of the areas that previously experienced flooding are now only at risk from large storm events that exceed the design capacity of the drainage system.

The Project Impact Flood/Flash Flood Committee identified and prioritized the following top flooding concerns in the Town of Erwin:

#1. Meads Creek: Meads Creek has caused repeated and severe flooding of Highway 17/15, Victory Highway, Long Acres, and part of Coopers Plains. Flooding affects local and regional transportation, houses, residential wells, residential septic systems, and businesses. Aggravating conditions include streambank erosion, sedimentation, debris jams, ice jams, and short flood warning time. Ongoing mitigation measures include: stream maintenance, channel stabilization (one project funded), stream gauges (have funding for 2, would like a 3rd), and precipitation gauges (have funding for 4). Additional support is needed to achieve the long-term objectives of: a stable stream channel, municipal sewer, municipal water,
improved flood forecasting, and flood stage mapping (indicating areas inundated at different flood levels).

#2. Cohocton River: The Cohocton River floodplain is extensively developed, including Coopers Plains, Victory Highway, Long Acres, Canada Road, and a railroad. Flooding affects transportation, houses, residential wells, residential septic systems, and businesses. The river is prone to ice jams. The new Route 15/Route 17 interchange will result in 4 or 5 additional bridges over the River. Mitigation needs include: uninterrupted access to data from upstream river gauges (esp. Avoca and Bath), correlation of existing flood stage maps with properties impacted, improved system for emergency notification, municipal sewer, and municipal water.

#3. Canisteo and Tioga Rivers: Flooding from the Canisteo and Tioga Rivers threatens industry, a municipal well house, houses, Route 417, local roads, railroads, farmland, and a golf course. The floodplain includes potential development sites, including the Erwin Industrial Park. There is no flood stage mapping to indicate the areas inundated at various river levels. In addition, hydrologic modeling of the combined impact of the two rivers would improve flood warning and response.

#4. Flash flooding of tributary streams: Tributary streams throughout the Town are subject to bank erosion, debris accumulation, ice jams, road and culvert damage, flooding of roads, and flooding of houses. Mitigation measures include: ongoing stream maintenance and stabilization (in Erwin and upstream), precipitation gauges (for early detection), and a notification system.

#5. Potential for development within 100-year floodplains and near streambanks: Development pressures may lead to increased utilization of flood-prone areas throughout the Town: within 100-year floodplains, near streams without mapped floodplains, and near stream banks susceptible to erosion.

#6. Stormwater drainage problems: Several areas in the Town have existing stormwater flooding problems. In order to prevent future drainage problems, good stormwater management and erosion control practices must be implemented at development and timber harvesting sites.

#7. Dam or levee failure: Flood protection in the Town of Erwin includes levees along the Cohocton and Tioga Rivers and three Corps of Engineers dams in the Tioga River watershed (Cowanesque, Tioga, and Hammond dams). Although failure of any of these structures is considered to be extremely unlikely, the potential damages could be enormous. A dam failure could result in water flooding a broad area of the Tioga River Valley.

Of these priority flooding concerns, the Project Impact Steering Committee included the following in their overall ranking of the nine highest priority hazards in the Town:

4 – Cohocton River
5/6 – Meads Creek
8 – Potential for development within 100-year floodplains and near streambanks
9 – Canisteo and Tioga Rivers

The Project Impact Transportation Committee cited flooding of the I-86 bridge over Meads Creek (near exit 42) as a major problem. When flooding has necessitated closure of the highway, the absence of viable detour routes has resulted in massive transportation difficulties. The
Transportation Committee’s report states: “The primary reason for this flooding appears to be that the culvert under the bridge is too narrow and is quickly overcome during periods of heavy rain and snowmelt. The committee recommends a thorough review by a civil engineering firm to confirm suspicions and recommend mitigation efforts.” Although this bridge is located outside of the Town of Erwin (in the Town of Campbell), the Project Impact Steering Committee selected upgrading or replacing this bridge as the Town of Erwin’s #2 mitigation priority.

Estimate of potential losses: The Town estimates that about 500 buildings are located in areas prone to flood damage. Average losses from the November 1996 flooding of the Meads Creek valley were about $3,000 per residential structure (single family houses and mobile homes); almost $1 million per business; and $700,000 in stream maintenance expenses. If each of the at-risk houses in the Town sustains average flood damages of $3,000, the residential damages would be about $1,500,000. Business losses could exceed $10 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: More than one week
- Incident stabilization: One week to two weeks of overtime emergency operations
- Potential impact: Serious injury or death is likely in extremely large numbers
  Moderate 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 Steuben County involve the release of fuel and other substances as a result of transportation crashes. The NYS Department of Environmental Conservation responds to about 30 spills per year in Steuben County, which includes an average of seven per year in the Town of Erwin. 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. The Steuben County Director of Emergency Services reports that in the last year there were six incidents in Steuben County involving the release of non-petroleum hazardous materials in transit, including one at the railroad switching station in Erwin.
• A hazardous material spill occurred at the railroad switching station and required evacuation of some homes in the Gang Mills area of the Town for about 24 hours.

**Probability of future events:** The Town of Erwin 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. The Project Impact Transportation Committee concluded that: “With two major highways and the Conrail tracks in Gang Mills, a high potential exists for a release to occur and spill into the atmosphere or in the ground highly dangerous substances. Nitrogen, hydrogen, propane, gasoline, and waste oil are commonly transported to and through the area.”

**Potential impact:** The Project Impact Emergency Services Committee assigned a high priority to a hazardous material accident from a fixed or mobile site, citing the high life hazard and medium cost impact of such an incident. The Steering Committee ranked this hazard third overall for the Town of Erwin.

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 lines (Norfolk Southern and B&H Rail) and the state and federal highways (Interstate 86, U.S. Highway 15, State Route 415, and State Route 417). These principal transportation routes pass through heavily populated areas of the Town. In addition, the Norfolk Southern Railroad switching yard is located near Gang Mills, not far from residential and commercial development. The Gang Mills area also has an extensive network of underground natural gas lines that could, if ruptured by natural causes or human error, cause significant fire and explosive damage to lives and property. 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 Erwin 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 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 railroad switching yard and
requires evacuation of a 5-mile radius, all but a few residents in the Town of Erwin would be displaced. The estimated cost of sheltering these residents could be over $100,000 (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 (estimate from DEC Spills Engineer). The assessed value of property within a 90° sector extending one mile from the railroad switching yard (in the worst-case wind direction) is $114,975,168. The release of a corrosive substance could necessitate cleanup and repair costs exceeding $11 million (based on an average expense of 10% of the assessed value within this potential impact area).

#3. 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. Because many Erwin residents rely on private well water, the Town has included contamination or potential contamination of the aquifer in this analysis.

**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:** No warning
- **Hazard duration:** More than 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
  - Severe structural damage to community infrastructure

**Past hazard events:** Wells throughout the country, and many in our own region, have experienced contamination problems.

- Following the 1972 Tropical Storm Agnes flood, customers throughout the region were advised not to drink the water.
- Minor flooding in 1994 contaminated well water for the Colonial Coach Estates I Mobile Home Park.
- During the January 1996 flood, the well house for the Colonial Coach I Mobile Home Park (in Long Acres) was flooded to a depth of three feet and the community wells were contaminated. The New York State Department of Health required the park operator to issue a Boil Water Notice that remained in effect for 4 or 5 months until improvements were made to the water system (which cost $45-50,000). The well for the Victory Village Mobile Home Park was also contaminated with floodwater.
During the November 1996 flood, community wells were compromised in three Long Acres mobile home parks. In one of these parks, residents were unable to drink the well water for two months.

The Town of Erwin Health Inspector reports that approximately 30% of the private wells tested have contaminated water. Most of these problems appear to result from contamination by private sewer systems or agricultural activities. Contamination in Long Acres and Coopers Plains is greater and probably exceeds 50% of the private wells. Water in these areas is frequently contaminated by *E. coli* bacteria or other parasites. These pathogens are sometimes resistant to chlorine, necessitating installation of filtration systems.

The Village of South Corning well was shut down for several months in the early 1990’s when a fire at an agricultural chemical business led to dispersal of contaminants near the Village well.

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 Erwin is provided by the Morningside Heights Water District, which utilizes water from the Chemung River Aquifer. The Project Impact Steering Committee assigned #2 priority to the need for wellhead protection to prevent contamination of the water supply. Potential sources of contamination identified by the Project Impact Water Source and Supply Committee include: industrial spills, fuel line leaks, vandalism, stormwater recharge, truck crashes involving hazardous materials, and train traffic. Vandalism impacting the public water supply could involve malicious or accidental actions by children, angry employees, terrorists, or others. Unused wells in areas that are now served by municipal water are potential routes for groundwater contamination if the wells are not properly plugged.

In order to minimize the risk of contamination, the Town has incorporated an Aquifer Protection Overlay District in the Town’s zoning law. The Town has also established well closure procedures that are required prior to hooking up to any municipal water system. 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 for the Town’s water system in compliance with federal requirements and all identified security deficiencies are being addressed. This vulnerability assessment and the water district’s Emergency Response Plan will be reviewed and updated annually. In addition, the ongoing maintenance and operational procedures for the water system are intended to minimize the risk of contamination within the distribution system.
Potential impact: The Project Impact Water Source and Supply Committee described the effects of wellhead/aquifer contamination: “In the event of contamination of the water supply, the Town’s water system is rendered useless until an alternative source can be created and connected, a purification system is employed, or the contamination is corrected. Temporary and permanent measures would be required to react to this event and the costs associated with this would be substantial.”

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 water district in the Town of Erwin serves approximately 1,100 residential, commercial, and industrial customers. The Morningside Heights water system serves residential and commercial customers in the Gang Mills area, Corning Inc.'s Sullivan Park complex and the Erwin Industrial Park on Route 417.

Areas served by private water supply wells are vulnerable to aquifer contamination, particularly in Coopers Plains and Long Acres, where onsite wastewater treatment systems and water supply wells are located on small lots. Periodic flooding exacerbates these problems. Four mobile home parks in Long Acres contain almost 200 sites. The water supply wells for these parks are highly susceptible to contamination by the community septic systems (particularly during periods of high seasonal groundwater levels) and by flooding. Many of the residents in these mobile home parks are elderly.

Estimate of potential losses: If the Town of Erwin is unable to provide potable water to any of the 1,100 customers in the Town of Erwin, it is anticipated that drinking water could be supplied by truck or some other means with few resulting health threats. The Steuben 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. If interruption of the water supply to one or more industries necessitates shutting down of operations, then the economic losses could be millions of dollars.

#4. FIRE

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

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: Two to three days
Incident stabilization: Less than one day 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: There have been no incidents of uncontrolled burning in the Town of Erwin in recent years.
- In 1995, a fire in Bath spread through about half block of buildings with old heavy-timber construction.
- A fire at the Steuben County landfill in the Town of Bath required several days to control.
- Pool chemicals mixed with garbage started a fire at the Steuben County Transfer Station in Erwin, but it was quickly controlled.

Probability of future events: Most fires are started by people through negligent behavior. Although house fires are the most common types of fire in the Town of Erwin, they rarely spread to adjacent properties. Fires impacting larger facilities occur occasionally.

Potential impact: A major fire in the Town of Erwin 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. The Project Impact Emergency Services Committee assigned a “medium life hazard” and “medium cost impact” to the fire hazard to industrial, commercial, and residential properties.

Vulnerable areas: The areas most vulnerable to multi-structure fires are those with closely spaced older buildings or commercial buildings. The mobile home parks (shown on the Vulnerable Sites map in Attachment A) have closely spaced trailers. Commercial buildings in the hamlet of Gang Mills include old structures as well as large newer buildings. 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. There are two nursing homes/intensive care facilities in the Town and one group home.

The Project Impact Emergency Services Committee assigned a high priority to fire hazards and listed the following locations of concern: residential, school, large industry, commercial, health care facilities, apartment complexes, and hotel/motel.
Estimate of potential losses: A credible worst-case fire in the Town of Erwin 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 Erwin is $26 million (excluding the land assessment).

#5. 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: Regular event (occurs once every one to seven 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:** 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 Steuben County include 96 severe weather reports in the twenty years from 1983 to 2002. Twenty seven of these storms had hail greater than 0.75 inches in diameter and seven had “killer hail” greater than 1.5 inches in diameter (based on severe weather spotter reports).
• 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. No tornadoes touched down in Steuben County.
• 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. Near 100 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.

Probability of future events: In recent years, Steuben County experienced severe weather reports an average of 4.8 times per year, hail 1.35 times per year, and killer hail 0.35 times per year. Because severe thunderstorms and hail are generally localized events, the probability of occurrence in the Town of Erwin is significantly lower than these county statistics would indicate.

Potential impact: The Project Impact Severe Weather Committee identified the following potential impacts of a severe thunderstorm and/or heavy rain event in the Town of Erwin:
• Flooding/flash flooding
• High winds
• Electrical power outage
• Structural damage
• Lightning strikes
• Loss of communications
• Public safety concerns
• Hail
• Micro-bursts/down-bursts
• Loss/reduction of transportation services
• Debris removal
• Water ponding
• Loss/reduction of emergency response services
• Loss of business – general economic losses
• Loss of employment
• Fuel depletions
• Land/rock slides
• Natural gas delivery loss
• Loss/contamination of water supplies/wells
• Loss of housing
• Property damage
High winds could have impacts similar to those resulting from a tornado:
- Limited warning time
- Structural damage
- Electrical power outage
- Loss/reduction of transportation services
- Loss/reduction of emergency response services
- Loss of communication systems
- Loss of home/business heating systems
- Fuel depletions
- Loss of employment
- Public safety concerns
- Loss of business – general economic losses
- Electrocutions
- Debris clearance
- Loss of refrigeration

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. Additional damages can result from power outages and flooding due to blocked drainage ways. 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. The locations of the Town’s mobile home parks are shown on the Vulnerable Sites map in Attachment A. 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.

#6. **PETROLEUM SPILL**

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

**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:** More than one week
- **Incident stabilization:** More than two weeks 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 25 to 30 petroleum spill incidents a year in Steuben County, which includes an average of 6 per year in the Town of Erwin.
- Over the years, the NYS Department of Environmental Conservation has responded to dozens of underground petroleum leaks from old storage tanks.
- Several petroleum releases in Steuben County have resulted from residential fuel oil tank leaks or delivery problems, including one when a delivery was inadvertently made to a house that did not have a tank.
- In the early 1990’s, an underground storage tank at a service station on South Hamilton Street in Gang Mills leaked for several days before it was detected. This incident required remediation and the installation of monitoring wells.
- In 1995, pipeline corrosion in the Town of Big Flats (Chemung County) 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 Erwin 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 and federal highways (Interstate 86, U.S. Highway 15, State Route 415, and State Route 417), which carry more truck traffic. These principal transportation routes pass through heavily populated areas of the Town. 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 Erwin 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 (Chemung County) 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.
#7. **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:** Likely to trigger another hazard
- **Frequency:** Frequent event (occurs more than once a year)
- **Onset:** No 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
  - Moderate physical and/or economic damage to private property
  - Moderate structural damage to community infrastructure

**Past hazard events:** Localized utility failures occur relatively frequently in Erwin, but service is typically restored within a few hours.

- In the mid-1960’s, brownout incidents impacted the entire northeast.
- 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. This led to a blackout period in portions of Erwin.
- 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 water system serving the Town of Erwin (Morningside Heights Water District) can have service interruptions due to treatment or distribution problems. The Town of Erwin has conducted a vulnerability assessment for the water district 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. The Project Impact Emergency Services Committee identified loss of communications as a significant concern in the Town of Erwin, due to the impact on emergency response to all other types of emergencies. The Project Impact Water Source and Supply Committee identified power failure as a significant threat to Erwin’s public water supplies. The Town has since addressed this risk by purchasing generators that enable operation of system pumps during a power outage. The Water Source and Supply Committee also recommended development of another well that could provide redundancy if contamination, a pump failure, or other event interrupts the supply from an existing well. This need was alleviated by a new well behind Lodge on the Green. 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 Morningside Heights water system, and the Corning Hospital.

Vulnerable areas: The entire community is vulnerable to the potential impacts of an electricity or telephone outage. The Morningside Heights Water District serves approximately 1,100 residential and industrial customers in the Gang Mills and Route 417 areas of the Town. Properties with gas and electric facilities are shown on the Critical Facilities map in Attachment A.

Estimate of potential losses: An extended utility outage in the Town of Erwin 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 $40,000 (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).

#8. 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: Several hours 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: National Weather Service records for Steuben 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 March 1991 resulted in massive power outages throughout an area extending from Steuben County to Rochester. Areas in Monroe County were without electrical power for about two weeks.
- 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).
- On April 3-5, 2003, an ice storm caused minor damages and power outages in parts of Steuben County. Widespread damage and power outages in areas north of Steuben County led to a federal disaster declaration for 15 counties (not Steuben). More than 16,000 individuals, businesses, non-profit organizations, and local governments applied for disaster assistance.

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 Steuben County. In recent years, Steuben 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: The Project Impact Steering Committee assigned a high priority ranking for an ice storm or wet snow event in the Town of Erwin. The Severe Weather Committee provided the following rationale for this ranking:
- High probability of occurring, as evidenced by the severe ice storms that have occurred in Rochester, NY (Monroe County) and the “North Country” of NY in the recent past. In addition, the impact would be devastating to the Town’s residents and the economy. The following is a listing of the potential impact on the Town due to an ice storm:
  - Electrical power outage
  - Loss/reduction of transportation services
  - Loss/reduction of emergency response services
  - Loss of communication systems
  - Loss of home/business heating systems
• Fuel depletions
• Home/business freeze-ups
• Loss of employment
• Public safety concerns
• Loss of business – general economic losses
• Electrocutions
• Debris clearance
• Loss of refrigeration
• Structural damage

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 Erwin (2000 census population of 5,385, excluding the Village of Painted Post) experiences an ice storm with damages of $175 per person, the losses would be about $1 million.

**#9. 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: Several individual locations are vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: No warning
- Hazard duration: One day
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is likely in extremely large numbers
  Severe physical and/or economic damage to private property
  Severe 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 Steuben County.

- A number of hazardous substances are utilized at the Sullivan Park Research Complex. Although accidents involving hazardous materials do occur, trained on-site staff successfully manages most incidents. Emergency response from outside sources is occasionally necessary. No major releases or deaths have occurred.
- The southern tier of New York has a high concentration of identified methamphetamine labs. These illegal drug-manufacturing operations utilize a number of hazardous substances. Fortunately, these labs have not resulted in any known releases of hazardous materials.
- Radon testing has identified high levels of naturally occurring radon in Steuben 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. Nine facilities in the Town report hazardous material inventories to the Steuben County Emergency Management Office and local fire departments under SARA Title III. 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.

Potential impact: The Project Impact Emergency Services Committee assigned a high priority to a hazardous material accident from a fixed or mobile site, citing the high life hazard and medium cost impact of such an incident. The Steering Committee ranked this hazard third overall for the Town of Erwin. 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 Project Impact Transportation Committee described the potential for fixed site releases of hazardous materials as follows:
Corning Incorporated has numerous research and development facilities in the Gang Mills area that store and experiment daily with many hazardous substances. While Corning Incorporated has an impeccable internal safety program and response teams with full knowledge of how to handle relatively small spills, a large spill could involve a portion or the entire Gang Mills area and force either partial or total evacuation. Dresser Rand is also located in the Town and stores some types of hazardous materials, but not of the magnitude of Corning Incorporated. Rail cars deliver into Dresser Rand almost daily and block North Hamilton Street vehicular traffic for short periods of time. Should one of those rail cars experience an accident or leak while in the center of the Village of Painted Post, a total Village evacuation could be a distinct possibility. Also considered fixed sites of potential danger are gasoline stations and the Conrail rail yards. Many rail cars sit dormant at the rail yards for many days to weeks waiting for the appropriate connection to their destination. A leak could occur or a collision in the yards could cause a catastrophic accident. Gasoline stations present potential hazards with vehicular fueling and underground leaks. While the later is more unlikely with today’s safety standards, accidents do occur.

Steuben County Emergency Management Office has SARA Title III Emergency and Hazardous Chemical Inventory Reports on file for nine facilities in the Town of Erwin. 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 Erwin 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. Almost the entire population of the Town of Erwin is within five miles of a major industrial facility. The estimated cost of sheltering these residents could exceed $100,000 (based on a Red Cross estimate that sheltering expenses are in the range of $25-100 per person per day). If the release occurs during the day, even more people would be impacted due to the location of an elementary school, daycare center, businesses, and industry in the Town. 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 (Chemung County) 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 90° sector extending one mile from a major industrial facility (in the worst-case wind direction) is $85,333,075. The release of a corrosive substance could
necessitate cleanup and repair costs exceeding $8 million (based on an average expense of 10% of the assessed value within this potential impact area).

#10. 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:** 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:** 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: Steuben 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.
- In the 1960’s, a wildfire burned a large hillside near (Mossy Bank).
- A wildfire near Mitchellsville required a week to clean up due to a large number of underground hot spots.
- In 2002, a wildfire in Canisteo was difficult to fight due to the steep terrain; firefighters were injured.
- In spring of 2003, a fire on Mulholland and Spencer Hills in the Town of Erwin got close to a few homes.

Probability of future events: Most wildfires are started by people through negligent behavior. 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 Erwin are thought to contain significant amounts of burnable material and have steep slopes that can promote the spread of
fire. The Project Impact Emergency Services Committee assigned a “low probability” to wildfires.

Potential impact: Wildfires in Steuben County seldom burn more than a few acres before they are controlled. Development patterns in the Town of Erwin 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 landslides, 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. The Project Impact Emergency Services Committee assigned a “low to medium life hazard” and a “medium to high cost impact” to wildfire hazards in the Town of Erwin.

Vulnerable areas: State land and other wooded areas in the Town of Erwin is at risk of wildfire. The risk is greatest in densely wooded areas with steep slopes. The densely wooded rural hillsides of Erwin contain substantial residential development, which could be vulnerable. The Project Impact Emergency Services Committee expressed particular concern about the risk of wildfire damage in this expanding urban interface.

Estimate of potential losses: A credible worst-case wildfire in the Town of Erwin would be one that results in the complete loss of several homes and/or rural structures. This damage could amount to many hundred thousand dollars.

#11. 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: Large 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: Four days to 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
  - Moderate structural damage to community infrastructure

Past hazard events: Ice jams have contributed to flood threats and flooding in the Town of Erwin:
• In 1976, an ice jam on the Tioga River caused flooding in the Gang Mills area of Erwin. Levees and flood control dams have subsequently improved the flood protection in this area. In 1979, ice jams in Meads Creek contributed to flooding in Erwin.
• In 1989 or 1990, an ice jam on the Cohocton River contributed to flooding of properties on Mill Street Extension in Coopers Plains.
• In January 1996, ice (not an ice jam) knocked loose the support under an elevated home on Mill Street Extension.
• Ice jams have formed in the Cohocton River near Coopers Plains (at the railroad bridge), but have generally broken free before major flooding occurred.

Probability of future events: Although ice jam flooding is not common, the Town of Erwin has several sites that are susceptible to the formation of ice jams.

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 could impact residential development along the Cohocton River (Coopers Plains) or near Meads Creek (Long Acres and Victory Highway).

Vulnerable areas: Areas along streams where debris jams have developed at bridges and culverts could experience similar flooding and erosion problems due to ice jams. The principle areas of concern in the Town of Erwin are the Cohocton River near Coopers Plains and Meads Creek. Both areas contain residential and commercial development that would be at risk.

Estimate of potential losses: Ice jam flooding in Meads Creek or the Cohocton River could impact a dozen or more houses. If the mobile home parks located near Meads Creek are flooded, the number of houses impacted could be greater. The maximum expected losses would be at least $100,000 (based on flooding of 6 houses with average flood damages of $8,000).

#12. 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: 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: One day
• Incident stabilization: More than two weeks of overtime emergency operations
• Potential impact: Serious injury or death is likely in extremely large numbers
  Severe physical and/or economic damage to private property
Severe structural damage to community infrastructure

Past hazard events: Steuben County has no history of terrorist incidents.

- 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 Steuben County, it necessitated emergency response to numerous concerns.

Probability of future events: Steuben County does not have attractive targets for politically motivated terrorist attacks. However, a disgruntled individual could conduct a terrorist act at any time. Computer viruses or hacking can cause damages, but are unlikely to disrupt essential services. The most likely terrorist incidents to impact the Town of Erwin are those which 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. The Project Impact Emergency Services Committee concluded that there is a “low probability” of a terrorist incident in the Town of Erwin.

Potential impact: A terrorist incident in the Town of Erwin 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 Project Impact Emergency Services Committee identified schools, industry, drinking water supplies, communications facilities, businesses, public assembly sites, computer systems, and dams as vulnerable locations. The Critical Facilities and Vulnerable Sites maps in Attachment A show the locations of schools, government buildings, emergency response facilities, a movie theater, and religious meeting places.

Estimate of potential losses: Consideration of a credible worst-case terrorist incident for the Town of Erwin 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 Erwin, 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 Erwin is $26 million (excluding the land assessment). A credible terrorist attack could destroy much of this facility.
#13. 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:** 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 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, Steuben County has not experienced a major transportation accident resulting in large numbers of casualties.
- A major school bus accident occurred in the Corning area in the 1980’s. Children riding the bus sustained only minor injuries; the driver was seriously injured.
- In the winter of 1991, a tractor-trailer lost control on slippery roads and blocked all four lanes of Route 15 at the Interstate 86 interchange. Traffic was blocked for several hours. At that time, Route 15 provided the only crossing of the Cohocton River in the Town of Erwin, so the accident isolated the Gang Mills area from emergency services. The area impacted included major industrial facilities (employing over 3,000 and housing hazardous substances), two nursing homes, more than 500 residences, and more than 15 commercial establishments.
- Tractor-trailer accidents on Interstate 86 have occasionally disrupted traffic.
- A couple of minor school bus accidents have occurred in Steuben 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 Erwin. 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. A major railroad switching yard is located within the Town. In addition, Interstate 86 and U.S. Highway 15 are the primary transportation arteries for east-west and north-south traffic in the region. 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: Emergency medical services in the Erwin/Corning area can handle about 15 patients at one time. If the number of casualties exceeds this capacity, neighboring services will provide assistance. A credible worst-case event in the Town of Erwin would be an accident involving a school bus. Potential cascade effects include: hazardous material spill, power outage, fire, and explosion.

Vulnerable areas: The Town of Erwin has numerous transportation corridors that carry commercial and tourist traffic through the region. In addition, the retail and industrial businesses in the Town result in commuter and consumer traffic. 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.

The Project Impact Steering Committee assigned top priority to a transit block at the I-86/Route 15 interchange, citing the following rationale:

The highway system from north to south is grossly inadequate for the volume of traffic currently traveling Route 15 north and south. One bridge exists that has an extremely high potential to become blocked by a traffic accident, as has been experienced several years ago. A blockage isolates Gang Mills from emergency medical services and access to the community hospital in Corning. Additionally, with the highway in very close proximity to the Painted Post business area, an accident with hazardous materials or an explosion could totally destroy many businesses and endanger many lives.

The Town of Erwin has removed some of the local traffic from Route 15 and provided an alternate route by extending Robert Dann Drive and constructing a new bridge over the Cohocton River (completed in 2002). The New York State Department of Transportation is currently upgrading the I-86/Route 15 interchange (construction began in late 2003) and plans to upgrade Route 15 to improve capacity and safety.

Another site of concern is the Interstate 86 bridge over Meads Creek, which is used by both east-west and north-south traffic. This bridge is prone to flooding, which can block traffic in both directions, causing massive traffic problems. All areas of the Town are also vulnerable to an airplane accident. The vulnerability to an airplane accident is greatest below the runway approaches for the Corning-Painted Post Airport.

Estimate of potential losses: A transportation accident involving a school bus, charter bus, or commercial airline could result in mass casualties. The Steuben 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 Erwin is $26 million (excluding the land assessment). An airplane crash could destroy much of this facility.
SECTION 5 – MITIGATION STRATEGY

The overall purpose of the Town of Erwin 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 Erwin 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, Project Impact program, and other planning efforts were reviewed and incorporated into this mitigation strategy. The following hazard mitigation goals are fully consistent with the broad community planning and development goals of the Town of Erwin Comprehensive Plan 2010 Update and support the “high quality of life” which that plan seeks to maintain.

Each mitigation goal is a general statement of what the Town of Erwin 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 Erwin 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 sections (Sections 6 and 7).

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 Corning Chapter of the American Red Cross.
- Make the Town of Erwin Hazard Mitigation Action Plan available to the public at municipal offices, public libraries, and online.

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

Objectives:
- Review the Town of Erwin Comprehensive Emergency Management Plan annually to verify that it is current and consistent with the Steuben County Comprehensive Emergency Plan.
- Provide municipal officials with periodic training in the Incident Command System and the operations procedures specified in the Comprehensive Emergency Management Plan.
- Periodically verify that the equipment identified in the Town of Erwin Comprehensive Emergency Management 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, 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 Erwin 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 Erwin Comprehensive Emergency Management Plan with the Town Board each time that the plan is updated.
- Review contents of the Town of Erwin Hazard Mitigation Action Plan with the Town Board and Planning Board each time that the plan is updated (at least every five years).
- 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 (including ice jam flooding)

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.

**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: Eliminate contribution of runoff from new construction and land use changes to increased flood risks.**

**Objectives:**

- Implement an effective municipal stormwater management program that is consistent with the requirements for of the New York State SPDES General Permit for Stormwater Discharges from Construction Activity.
- 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 at facilities that store and/or use hazardous materials to minimize the risk of explosion or exposure to hazardous substances.

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 crash history information (in the Schuyler-Steuben Rural Transportation Needs Study, October 4, 2002) 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 Schuyler-Steuben Rural Transportation Advisory Committee, 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 Schuyler-Steuben Rural Transportation Committee, 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 crash history information (in the Schuyler-Steuben Rural Transportation Needs Study, October 4, 2002) 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 Schuyler-Steuben Rural Transportation Committee, 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.
• Develop and periodically update an emergency response plan for the Corning-Painted Post Airport.
• Periodically review and update hospital disaster plans.
• Ensure widespread awareness that 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 in Chemung, Steuben, and Schuyler Counties.

WATER SUPPLY CONTAMINATION

Goal: Protect public water supplies from contamination

Objectives:
• Ensure that public water suppliers prepare vulnerability assessments.
• Ensure that public water suppliers prepare and periodically revise emergency response plans, which incorporate the findings of the vulnerability assessment.
• Delineate and protect recharge areas for public water supplies.
• Properly close unused wells in public water supply recharge areas to prevent contamination
of the aquifer.

**Goal: Monitor the quality of private well water and alleviate health risks.**

**Objectives:**
- Encourage residents, businesses, and institutions that rely on private well water supplies to periodically test their water for pathogens.
- Refer the owners of wells with contamination problems to the New York State Department of Health for technical assistance in order to reduce the potential health risks.
- Conduct routine water testing and implement any necessary protection measures for non-municipal public water supplies (restaurants, bars, schools, etc.).

**Goal: Ensure that onsite wastewater treatment systems (septic systems) function properly.**

**Objectives**
- Develop and implement a public information and outreach program that encourages appropriate maintenance of onsite wastewater treatment systems.

**Goal: Provide municipal sewer and/or water service to areas with chronic well water contamination problems.**

**Objectives:**
- When public support exists, pursue the formation of sewer districts and solicit funding for municipal sewer projects in areas where failing septic systems contribute to groundwater contamination problems.
- When public support exists, pursue the formation of water districts and solicit funding for municipal water projects in areas with documented groundwater contamination problems.

**FIRE/WILDFIRE**

**Goal: Raise public awareness about fire safety.**

**Objectives**
- Periodically disseminate educational information about fire prevention and safety to school children and the general public.

**Goal: Ensure quick and effective response by fire departments to fires and wildfires.**

**Objectives**
- Ensure that fire department personnel have the training and equipment needed to respond effectively to fires and wildfires.
- Effectively coordinate responses among multiple fire department responding to an incident.
Goal: Construct new development in such a manner as to reduce the susceptibility to fire damage.

Objectives:
- Develop and implement building standards with greater fire safety provisions than those in the NYS Building Code.

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.
- Provide brush pickup services and/or designated drop-off locations to encourage residential tree maintenance.
- 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 Erwin Comprehensive Emergency Management 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.

**Goal: Protect against a water supply shortage in the Corning Area Aquifer.**

Objectives:
• Ensure that groundwater use in the Corning area does not exceed the safe yield of the Corning Area Aquifer.
• Develop and implement a drought emergency plan for the Corning area, in cooperation with neighboring municipalities.
• Identify locations that provide significant groundwater recharge and protect the recharge capacity of these areas.

**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 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 Steuben 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.
SECTION 6 – IMPLEMENTATION THROUGH EXISTING PROGRAMS

The recommended mitigation actions presented in this plan were developed at a Project Impact Executive Committee meeting (held on August 18, 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. In addition, a list of potential mitigation actions was assembled from recommendations and priorities developed for previous hazard mitigation planning efforts (by the Erwin and Campbell Flood Mitigation Planning Committee, the Town of Erwin Project Impact subcommittees, the Project Impact Steering Committee, and the Project Impact Executive Committee). 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 Erwin (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?
- **Administrative**: Are the staff and funding available to implement and maintain the action? **NOTE**: Those actions that are otherwise recommended, but cannot be implemented with existing resources are presented in the following section (Section 7).
- **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?

Those actions that satisfy these criteria are recommended as high priority actions and are presented in this section. Because these actions can be incorporated into existing local programs and implemented with existing resources, they can be readily implemented. Some of the proposed actions in this section do not constitute a complete solution, but represent the portion of a desired action that can currently be implemented by the local partners. Those actions that require financial resources not currently available to the Town, but satisfy the other criteria, are also recommended as high priority actions and are presented in the following section (Section 7).
The Town of Erwin 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 proposed activities listed in this section 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 Erwin plans to continue or initiate each of the activities presented in this section. 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**

A high priority recommendation of the Project Impact committee was to educate all constituencies on emergency preparedness (Priority 3A). The Project Impact Education Committee recommended the following outreach activities and estimated an implementation cost of $5,000 ($3,000 Project Impact funding and $2,000 contribution by local partners). These recommendations are incorporated into the following measures.

- Utilize direct mailing to all Town residents, businesses, and schools
- Broadcast public service announcements
- Participate in American Red Cross’ “Community Disaster Education Program”
- Establish emergency response web-site as an educational and informational resource
- Convene a meeting to introduce Town’s Emergency Management Plan (to media, local business leaders, emergency responders, etc.)
- Facilitate discounted price for NOAA weather radios/monitors
- Develop emergency information place mats for local restaurants
- Disseminate hazard information at Town Hall

**Utilize direct mailings to Town residents:** The Project Impact Education Committee recommended that the American Red Cross/FEMA “Your Family Disaster Plan” pamphlet and the “New York State Weather Hazards Awareness Guide” be mailed to all Town of Erwin residents. The Project Impact Water Source and Supply Committee identified targeted mailings as a means to increase public awareness of the importance of water conservation in an emergency and the associated methods to accomplish this.

**Utilize direct mailings to businesses and schools:** The Project Impact Education Committee recommended that the American Red Cross pamphlet “Preparing Your Business for the Unthinkable” be mailed to all businesses and schools in the Town of Erwin.

**Broadcast public service announcements:** The Steuben County Office of Emergency Services will continue to periodically prepare public service announcements about emergency
preparedness and response and distribute this information to local media for broadcasting. The Project Impact Education Committee has assembled sample public service announcements, which will be used as appropriate.

**Develop community emergency training program:** Steuben County is developing a Citizen Corps Council program to recruit and train volunteers for emergency response and disseminate information to the public about emergency preparedness. The program utilizes American Red Cross training resources. Grant funding has been received and program development is in progress. The partners in this effort include:

- Steuben County Office of Emergency Services
- Greater Steuben Chapter of the American Red Cross
- Steuben County Retired Senior Volunteer Program (RSVP)
- Steuben County Emergency Medical Service Association
- Steuben County Public Health Nursing Service
- Bath Village Police Department
- Pro Action of Steuben & Yates Counties
- Steuben County Fire Chief’s Association
- Steuben Count Sheriff’s Department

**Disseminate hazard information on the internet:** The Steuben County Office of Emergency Services has a website with public information about emergency preparedness and response. The County will continue to maintain and update this information as appropriate. When the Town of Erwin next expands the Town website, a link will be provided to the County Emergency Services site. The *Town of Erwin Hazard Mitigation Action Plan* will be posted on the Town website if possible.

**Convene a public meeting to introduce Town’s Emergency Management Plan:** The Project Impact Education Committee recommended that the Town of Erwin convene a meeting with the media, local business leaders, emergency responders, and others to introduce the Town’s Emergency Management Plan to the public.

**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. Two NOAA Weather Radio broadcast towers were established in Steuben County in 2002. This was a high priority recommendation of the Project Impact Committee (Priority 2). 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.

**Develop emergency information place mats for local restaurants:** The Project Impact Education Committee recommended that the Town of Erwin and/or the Gang Mills Fire Department work with local restaurant operators to have place mats imprinted with pertinent emergency information.
Disseminate hazard information at Town Hall: At least once a year, the Project Impact Coordinator reviews the brochures that are available in the Town Hall and evaluates the need for additional information about hazards, emergency preparedness, hazard mitigation, and stormwater management. Appropriate brochures are 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 Erwin Hazard Mitigation Action Plan* will be available at the Town Hall.

**Emergency Services**

Review and update *Comprehensive Emergency Management Plan*: The *Town of Erwin Comprehensive Emergency Management Plan* documents procedures that enable the Town to provide leadership and coordination during an emergency. Development of this plan was a high priority recommendation of the Project Impact Committee (Priority 1). The plan was completed in 2001 and revised in 2003 and 2004. In order to insure that the information in this plan remains current and accurate, the Town will review and update it annually or after any event that triggers activation of the plan. The Town of Erwin Project Impact Coordinator is responsible for periodic review of the *Town of Erwin Comprehensive Emergency Management Plan*, in coordination with elected officials, municipal staff, and emergency response personnel.

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

- Test emergency communication equipment; upgrade as appropriate.
- Verify the availability of flood stage maps, which indicate areas expected to be inundated when Cohocton 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. Request copies of the Memoranda of Understanding between the Red Cross and facilities in the Town.
- Contact the Steuben County Office of Emergency Services to verify that the Steuben County Animal Disaster Plan includes an up-to-date list of local animal hospitals, kennels, and other places where pets and farm animals can be housed during an evacuation.
- 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.
- Contact the safety officer of each school and daycare center to (1) verify that each has a copy of the *Town of Erwin Comprehensive Emergency Management Plan*, (2) review the school’s Safe Schools Against Violence in Education (S.A.V.E.) plan or emergency plan, and (3)
verify that the plans are consistent. Schools and daycare facilities in the Town of Erwin include: Erwin Valley Elementary School and Erwin Child & Family Center.

- Contact key industries and businesses (nursing homes, elderly housing, health care facilities, the airport, businesses that handle hazardous materials, etc.) to verify the following: (1) that each has a copy of the Town of Erwin Comprehensive Emergency Management Plan, (2) that each facility has an emergency response plan, (3) that the plans are consistent, and (4) that up-to-date SARA Title III (Tier 2) 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.

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

Test off-site setup of flexible site command post: A high priority recommendation of the Project Impact Committee was to establish a fixed site command post on the Gang Mills side of the rivers (Priority 3B). This recommendation was revised to a flexible site command post for greater cost effectiveness and portable equipment was purchased in 2002. This equipment has been set up and tested on-site in the Town Hall. The Erwin Fire Council will test off-site setup of this equipment.

Provide NOAA weather radios to public facilities: Two NOAA Weather Radio broadcast towers were established in Steuben County in 2002. This was a high priority recommendation of the Project Impact Committee (Priority 2). The Project Impact Committee has identified about a dozen facilities in the Town 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.). The Environmental Emergency Services Public Information and Education Committee is currently evaluating the available models. The Erwin Project Impact Committee has allocated funding to purchase a NOAA weather radio for each of the identified facilities.

Support Erwin Fire Council: The Town of Erwin will continue to encourage and support the Erwin Fire Council, which has been formed to coordinate and enhance the emergency response capability within the Town.

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 Erwin has historically contributed to the operating expenses of this organization and is represented on the Board of Directors.

Establish a badge/emergency access system: In response to a recommendation of the Project Impact Emergency Services Committee, the Erwin Fire Council is developing a badge/emergency access system that will facilitate site access by public officials and emergency personnel when emergency travel restrictions are enacted. The system will encompass the Town
of Erwin, Village of Painted Post, Forest View/Gang Mills Fire Department, Coopers Plains/Long Acres Fire Department, and Village of Painted Post Fire Department. Protocol and procedures are currently being developed. The Town and Village have agreed to split the cost for implementation and maintenance of the emergency access system. Implementation costs are estimated to be $12,500 or less.

Preventive Measures

Periodically review and revise community development plans and land use regulations: The Town of Erwin periodically reviews and revises the Town’s land use regulations. The following issues will be evaluated as part of this planning 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?
- Are local regulations prohibiting the misuse of flood control levees warranted?
- Are the aquifer protection standards adequate and effective?
- 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 and Zoning Board of Appeals members: The Project Impact Coordinator/Code Enforcement Officer, Town Manager, Highway Superintendent, and other Town staff periodically brief the Town Board, Planning Board, and Zoning Board of Appeals about hazards that relate to site planning, transportation patterns, and development standards.
FLOOD/FLASH FLOOD

Public Information

Utilize direct mailing to owners of flood-prone property: The Town of Erwin 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.

Support Chemung Basin River Trail: The Chemung Basin River Trail Partnership has been established to encourage and facilitate recreational use of the Chemung River and its tributaries. By enhancing recreational access to the rivers, this organization is increasing the public understanding of water resources and discouraging non-recreational development of floodplain areas. Activities include the an annual river float, development of boat launches, creation of an artistic watershed map, installation of educational kiosks, publication of a Chemung Basin River Trail Guide, and river cleanup activities. The Kinsella Park boat launch site is located on the Cohocton River at an Erwin Town park. The Town will continue to assist with maintenance of this site.

Emergency Services

Install automated precipitation gauges in Meads Creek Watershed: A priority mitigation recommendation of the Project Impact Committee was to install precipitation and stream level gauges in the Meads Creek watershed and develop flood stage information (Priority 9A). The Steuben County Office of Emergency Services has procured funding for four automated precipitation gauges in this watershed. The equipment has been purchased and gauge sites are currently being evaluated. Once installed, these gauges will report to the automated gauge network operated by the Flood Warning Service of Steuben and Chemung Counties (part of Environmental Emergency Services, Inc.) This project is funded, in part, by the NYS Clean Water/Clean Air Bond Act and the Integrated Flood Observing and Warning System (IFLOWS) of the National Weather Service.

Develop rating curves for Meads Creek stream gauges: A priority mitigation recommendation of the Project Impact Committee was to install precipitation and stream level gauges in the Meads Creek watershed and develop flood stage information (Priority 9A). Environmental Emergency Services has subsequently installed two real-time stream gauges in Meads Creek (both locate upstream of Erwin in the Town of Campbell) and painted staff gauges at both sites to enable on-site observation of the stream stage. In order to enhance the value of the data from these gauges, rating curves will be developed to correlate stream levels with discharge. In order to develop rating curves, the stream discharge will be repeatedly measured at each gauge site under various flow conditions. Environmental Emergency Services, Inc. has purchased the flow meter needed to make these measurements, which will be done by the Regional Flood Mitigation Specialist.
(with Southern Tier Central Regional Planning and Development Board) with technical assistance from the Susquehanna River Basin Commission and U.S. Geological Survey.

Expand network of volunteer rain gauge readers: The Steuben County Office of Emergency Services coordinates the National Weather Service (NWS) volunteer rain gauge program in which a network of volunteers monitor precipitation amounts and report extreme events to both the County and the NWS. The Town of Erwin will assist the Office of Emergency Services with recruitment of volunteers to fill the gaps in this existing network, particularly within the Meads Creek watershed.

**Preventive Measures**

Evaluate potential to establish new benchmarks: Compliance with floodplain development regulations necessitates determination of building elevations, which must be surveyed to established benchmarks. There are currently no approved benchmarks south of the Cohocton River in the Town of Erwin. In order to reduce surveying costs, the Town of Erwin Code Enforcement Officer will identify sites with certified elevations and evaluate the potential for requesting revision of the Town’s Flood Insurance Rate Maps to include these benchmarks.

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 Federal Emergency Management Agency is currently implementing a map modernization program to prepare updated digital floodplain maps. When updated maps are developed for the Town of Erwin, the Town plans to also utilize the hydrologic and topographic information for flood stage mapping (Priority 8 of the Project Impact Committee mitigation recommendations). The Town of Erwin has provided a FEMA contractor with information about changes in the Town since preparation of the existing floodplain maps for use in their mapping needs assessment. In addition, the Town will periodically repeat their request for updated floodplain mapping to the Department of Environmental Conservation, Bureau of Flood Control (which is implementing map modernization efforts in New York).

Inspect and maintain drainage ways: The Town of Erwin will continue to fund and implement its ongoing maintenance program for road ditches, culverts, streams, and other drainage features. Maintenance is financed through the Highway Department budget when problems impact Town roads. Stream maintenance is funded by the Town of Erwin Stream Management District (with a property tax assessment of 3 cents per $1,000). The Steuben County Soil and Water Conservation District (SWCD) provides technical assistance for implementation of stream maintenance projects. In order to more effectively maintain the Town’s streams, the Erwin Stream Management District needs access to additional equipment (excavator, crusher, bulldozer, track equipment, etc.) The Town Highway Superintendent is currently evaluating the options and costs for obtaining access to this equipment (shared services, purchase, rental, etc.) and will submit recommendations to the Town Board for consideration.
Inspect and maintain the Cohocton River near the Robert Dann Drive Bridge: The Town of Erwin built a new bridge over the Cohocton River to provide an alternate access route to Gang Mills (Priority 9B of the Project Impact Committee mitigation recommendations). In order to meet the design criteria for this bridge—including the requirement that there be no increase in the height of the 100-year flood level—gravel and cobble were removed from the river channel downstream of the bridge site. The following inspection and maintenance tasks will be implemented at this project site:

- Site visit and inspection of the Robert Dann Drive Bridge structure by the Town of Erwin after each flooding event to ensure that there are no restrictions to the hydraulic opening.

- Annual Site visit and visual inspection of the Cohocton river channel in the vicinity of the gravel bar for deposition of granular material/sedimentation. Each site visit will be documented with a photo log that will be maintained by the Town of Erwin and forwarded to the NYSDEC Region 8 Division of Water - Flood Control Unit and Bureau of Habitat and the Army Corps of Engineers Buffalo District.

- Survey the channel when there is visual evidence that the gravel bar is reoccurring. As part of this project two survey benchmarks will be placed in the vicinity of the existing gravel bar to be used to evaluate the river deposition. The results of such survey will be forwarded to Region 8 NYSDEC Division of Water – Flood Control Unit and Bureau of Habitat and the Buffalo District Army Corps of Engineers.

- Upon completion of the gravel bar removal, surveyed cross-sections of the channel were obtained in order to establish an “as-built” channel condition. These cross-sections will serve as a basis for comparing future conditions and the potential need for additional maintenance efforts. These as-built cross-sections will be transmitted to the NYS DEC Bureau of Habitat and Division of Water – Flood Control and to the Buffalo District Army Corps of Engineers.

- The Town will undertake any maintenance actions identified as part of the annual inspection. These maintenance actions or other in-stream activities identified during this inspection must be authorized by NYSDEC.

**Natural Resource Protection**

**Support efforts to restore and construct wetlands:** The Upper Susquehanna Coalition is developing a program to restore, increase, and/or develop wetlands throughout the Chemung Basin. The primary goal of this program is cost-effective flood attenuation, through construction of numerous small-scale projects. Additional benefits include water quality improvement, habitat enhancement, and recreation. The Meads Creek watershed is among the high priority watersheds for wetland development and several sites are currently under review for establishing wetlands. The Town of Erwin and Steuben County Soil and Water Conservation District will continue to cooperate with these efforts to establish and reclaim wetlands, especially in the Meads Creek drainage basin.

**Encourage establishment and maintenance of vegetated riparian buffers:** The Town will continue to support the establishment and maintenance of vegetated buffer strips along waterways.
Vegetated riparian buffers are valuable for maintaining and establishing stream stability and also provide limited flood control benefits (by slowing and storing floodwater). Funding assistance for establishing riparian buffers is available through NRCS programs and other sources. The Stream Corridor Overlay District, which was established in the Town’s December 2003 zoning update, includes requirements for preserving existing riparian vegetation and for locating development away from wetlands and stream banks.

**Enforce Town of Erwin timber harvesting regulations:** In May 1999, the Town of Erwin enacted timber harvesting regulations to control runoff and erosion from logging operations. The Code Enforcement Officer enforces these regulations, with technical assistance from the Steuben County Soil and Water Conservation District. When opportunities arise, the Code Enforcement Officer will attend training to improve his understanding of good management practices for timber harvesting projects.

**Property Protection**

Provide technical assistance for floodproofing measures: The Code Enforcement Officer will continue to provide technical assistance for elevation of utilities and other measures to floodproof existing structures and minimize future flood damages. Residents and business owners are most likely to seek this assistance after a flood event. Information about various property protection measures is included in brochures displayed at the Code Enforcement Office and mailed annually to floodplain residents. 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 Erwin is working to reduce the cost of flood insurance by improving their Community Rating System classification (which currently enables a 10% reduction in the cost of flood insurance in the 100-year floodplain and 5% elsewhere). 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 reduced premiums will encourage the owners of flood-prone property to purchase and maintain adequate flood insurance coverage.

**Structural Solutions**

Improve drainage capacity at Brook Road and Fox Lane: The Town of Erwin was awarded grant funding (from the Pre-Disaster Mitigation Program) to replace an undersized culvert under Fox Lane that contributes to flooding along Brook Road. At the time of this report, the project was 95% complete. A downstream culvert, recently installed by a developer, is sized to
accommodate the additional flow contained in the channel as a result of upgrading the upstream structure.

Encourage upgrading of the I-86 bridge over Meads Creek: A high priority recommendation of the Project Impact Committee was to increase the capacity of the Meads Creek bridge near Exit 42 from Interstate 86 (Priority 4). Although this structure is located in the Town of Campbell, it contributes to downstream flooding problems in the Town of Erwin and its closure has transportation impacts for the entire region (necessitating a 50-mile detour for traffic on Interstate 86). At the recommendation of the Erwin Project Impact Committee, the New York State Department of Transportation has reviewed this structure, but has no current plans to expedite its replacement. The Town of Erwin, in coordination with the Town of Campbell, will periodically alert DOT to the hazards associated with this structure and request expedited resolution of the problems.

HAZARDOUS MATERIALS

Establish a hazardous material response team: A priority mitigation recommendation of the Project Impact Committee was to purchase equipment and supplies for a hazardous material response team (Priority 6A). The Steuben County Office of Emergency Services is currently utilizing weapons of mass destruction grant funds for the training and equipment purchases needed to develop a county response team with Level A capability. Additional funding may be needed in the future to maintain this capability.

Provide hazardous material awareness training for Town Highway Department staff: Town Highway Department staff should receive periodic training in hazardous material awareness. The Steuben County Office of Emergency Services offers this training every two to three years.

TRANSPORTATION SAFETY

Support implementation of the Schuyler-Steuben Rural Transportation Needs Study recommendations: A two-county rural transportation advisory committee has been formed to implement the recommendations of the Schuyler-Steuben Rural Transportation Needs Study (completed October 4, 2002). This study recommended the following transportation safety tasks:

1. System Planning and Management
   - Develop comprehensive traffic management plan(s) for routine, special, and emergency traffic conditions
   - Secure/disseminate model access management-related ordinance language for local consideration
   - Promote greater use of context-sensitive design principles

2. Intelligent Transportation Systems (ITS)
   - Establish intermunicipal/interagency agreements for traffic-related information sharing
   - Build the region’s system management efforts around the NYSDOT Region 6/New York
State Police Transportation Management Center
- Progress rural ITS deployments in the two counties
- Develop a regional ITS architecture

3. Safety Promotion
- Institute a bi-county safety management system to consolidate crash reporting and analysis of crash data
- Identify locations for pursuit of safety improvements
- Continue county Traffic Safety Boards
- Inventory bridge-related signage, clearances, and other non-structural attributes for safety issues
- Progress traffic calming treatments

The Town of Erwin will provide support and assistance as needed to implement these transportation safety recommendations.

Maintain communication with NYS Department of Transportation and County Highway Department: Communication and coordination with the NYS Department of Transportation (DOT) has been extremely productive in the scheduling and design of the upgraded I-86/Route 15 interchange. This project is the highest priority recommendation of Erwin’s Project Impact Committee and began construction in 2003. Throughout the implementation of this project and all future DOT projects in Erwin (including upgrading 6 miles of Route 15 to Interstate Highway standards), Town staff will actively seek to maintain good lines of communication with DOT. Town staff will also continue to work closely with the County Highway Department on County projects (such as the recently completed Mulholland Road Bridge replacement, which improved Tioga River hydraulics at this site). Town representatives and emergency response personnel will review draft plans to evaluate drainage, site access, and other conditions that might impact flooding, hazardous materials, or emergency response.

Provide municipal personnel with defensive driving training: Municipal staff who drive private or municipally owned vehicles as part of their jobs will periodically be provided the opportunity to attend defensive driving classes.

WATER SUPPLY CONTAMINATION

Enhance safety of the Route 417 water line extension: The Town of Erwin is undertaking a water line extension project along State Route 417 to the Erwin Industrial Park. The project involves extending water lines 18,800 linear feet to connect the Gang Mills service area with the Industrial Park. Implementation measures that will enhance the system’s safety include painting the inside of two water storage tanks and expanding the automated monitoring and operating control system (SCADA). The Town requires well closure procedures for demolitions and all new hookups to this system.

Enforce Aquifer Protection Overlay District regulations: The Town of Erwin Zoning includes special regulations applicable to three Aquifer Protection Overlay Districts that delineate
recharge areas for municipal water supply wells. The Town will continue to strictly enforce these regulations.

Encourage proper maintenance of onsite wastewater treatment systems: The Town of Erwin will obtain brochures about septic system maintenance to display in the Code Enforcement Office. Those desiring additional information will be referred to the NYS Department of Health. In addition, Town officials will investigate the potential options and expenses for an expanded Town role in the maintenance of privately owned septic systems.

SEVERE WEATHER

Provide brush pickup and drop-off services: The availability of a program for disposal of brush and tree branches encourages residents to conduct periodic maintenance, which can reduce damages from an ice storm or wind storm. The Town will continue to provide a brush pickup and drop-off service, which costs about $10,000 per month. In addition, the Town will provide residents with information about this service.

TERRORISM

Assess the vulnerability of the Erwin water system to a terrorist attack: The Town of Erwin Water System has prepared a vulnerability assessment, which included an evaluation of terrorist threats. All identified vulnerabilities are being addressed through operating procedures and emergency response planning. Both the vulnerability assessment and the emergency response plan will be reviewed and updated annually.
SECTION 7 – PROPOSED MITIGATION PROJECTS

The recommended mitigation actions presented in this plan are those that address the high priority hazards for the Town of Erwin (presented in Section 4) and contribute to achieving the goals and objectives in Section 5 of this plan. Alternative mitigation actions were evaluated and prioritized by the Project Impact Executive Committee based on the criteria presented in Section 6 (social, technical, administrative, political, legal, economic, and environmental). Those actions that satisfy all of these criteria are recommended as high priority actions and are presented in the previous section (Section 6). Those actions that require funding or other resources that are not currently available to the Town, but satisfy all of the other criteria, are also recommended as high priority actions and are presented in this section.

The high priority mitigation measures recommended by the Project Impact Committee (based on recommendations of the subcommittees) and the status of these efforts is summarized below:

0) Upgrade I-86/Route 15 interchange: DOT began construction late in 2003 and plans to complete the project in 2006 (much earlier than the previously planned 2013 completion date).
1) Update Erwin Emergency Response Plan: Updated plan was adopted May 2001; plan was reviewed and updated in 2003 and 2004.
2) Install NOAA Weather Radio transmission towers: Two NOAA Weather Radio broadcast towers were established in Steuben County in 2002.
3A) Educate all constituencies on emergency preparedness: Additional public education measures are recommended.
3B) Establish fixed site command post on the Gang Mills side of the rivers: Recommendation revised to a flexible site command post for greater cost effectiveness; portable equipment was purchased in 2002 and tested.
4) Increase capacity of Meads Creek Bridge near Exit 42: NYS Department of Transportation is reviewing upgrade possibilities.
5) Emergency generators for Erwin water supply systems: Permanent and portable generators were purchased for Town’s sewer and water systems in 2001; equipment is tested weekly and maintained routinely. Emergency generators were obtained for the water system booster pumps at Fox Lane and Overbrook Road in 2004.
6A) Hazardous material response team: Steuben County Emergency Management Office and the Erwin Fire Council are investigating alternatives; funding is not currently available.
6B) Local radio transmitters: Vendors have been contacted; cost is prohibiting implementation.
8) Flood stage forecast maps: This recommendation will be implemented in conjunction with modernization of Flood Insurance Rate Maps; Steuben County is not currently a high priority for FEMA funding.
9A) Gauges and flood stage information for Meads Creek: Two stream gauges have been installed by Environmental Emergency Services, Inc.
9B) Second bridge over Cohocton River connecting Canada Road to Victory Highway: Bridge was completed by the Town in 2002.

11A) Water retention in the Meads Creek Watershed: Funding is needed for hydrologic evaluation.

11B) Update In-Town Drainage Study for Gang Mills Area: Funding is not currently available.

In order to complete these recommendations and to meet the goals and objectives identified in the previous section, the Town of Erwin is seeking funding to enable implementation of the following actions. This action plan only includes the high priority projects that can be accomplished over the next several years by the Town of Erwin and the Steuben 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.

The Town of Erwin 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**

Install and maintain local radio transmitters: A priority mitigation recommendation of the Project Impact Committee is to establish a system of low power local radio stations for transmission of emergency information and advisories (Priority 6B). It is anticipated that a system of eight to ten stations targeting the major transportation routes would broadcast to most low-lying and densely populated areas in the Town. These stations would broadcast ‘endless loop messages’ with weather forecasts, flood warnings, flood watches, flood stages, travel advisories, evacuation notices, and other emergency information. Both travelers and residents could receive this information using standard radio equipment.

- Estimated cost: Approximately $50,000
- Potential funding sources: To be determined
- Project lead: Environmental Emergency Services
- Supporting partners: Steuben County Office of Emergency Services
- Estimated timetable: When funding is available

**Emergency Services**

Provide emergency response training for municipal officials: The Town Supervisor, Town Manager, key municipal staff, and first responders should receive periodic training in the Incident Command System and emergency operations procedures. The Steuben County Office of
Emergency Services will request that the NY State Emergency Management Office (SEMO) conduct Incident Command System training for the Town of Erwin 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.

- Estimated cost: About $500 for tabletop and $1,200 for a functional exercise
- Potential funding sources: To be determined
- Project lead: Steuben County Office of Emergency Services
- Supporting partners: State Emergency Management Office
- Estimated timetable: Biennially if funding and staff resources permit

**Install and maintain a radio repeater tower:** There are currently many dead spots throughout the Town, where the Highway Department personnel are unable to maintain radio communications. In order to insure effective communication during both routine and emergency conditions, a short repeater tower and base station are needed. If possible this project will be coordinated with neighboring towns that experience similar radio communication problems (Hornby, Campbell, Corning, Lindley, and Caton).

- Estimated cost: About $40,000 for tower and base station; unknown additional expense for property
- Potential funding sources: To be determined
- Project lead: Highway Superintendent
- Supporting partners: Highway Superintendents of neighboring Towns
- Estimated timetable: When funding is available

**Preventive Measures**

**Expand Geographic Information System (GIS) capability:** Although the Town of Erwin currently has limited GIS capabilities, system improvements are needed to enhance the value of this tool. The Town would like to purchase a new computer, upgrade their GIS software, and obtain GIS training. This would enable Building Department staff, Highway Department staff, Planning Board members, and other municipal personnel to incorporate site-specific information about infrastructure and hazard areas into their decision-making processes. Access to digital map information could also enhance the Town’s ability to respond to emergency situations.

- Estimated cost: Approximately $45,000
- Potential funding sources: Municipal budget
- Project lead: Town Manager
- Supporting partners: 
- Estimated timetable: When funding is available
FLOOD/FLASH FLOOD

Public Information

Provide site-specific packets of flood information (“flood audits”): The Project Impact Flood/Flash Flood Committee recommend that the Town of Erwin provide the owners of flood-prone properties with packets of detailed, site-specific information about the history of flooding, the meaning of river gauge levels, evacuation procedures, evacuation routes, etc. (flood audits). This can only be done where flood stage forecast mapping is available to enable correlation of gauge heights with anticipated water levels at each property.

- Estimated cost: To be determined
- Potential funding sources: To be determined
- Project lead: Steuben County Office of Emergency Services
- Supporting partners: Environmental Emergency Services, Inc.
- Estimated timetable: After Flood Insurance Rate Maps are modernized and updated flood stage information is available

Emergency Services

Provide swiftwater rescue training for fire departments: The Bath Volunteer Fire Department has a swiftwater rescue team that may be available to assist with rescues in Erwin, if needed. However, operations level swiftwater rescue training of local fire departments would facilitate local response to a swiftwater incident.

- Estimated cost: $50 per person for team of 10 to 15 fire fighters
- Potential funding sources: To be determined
- Project lead: Erwin Fire Council
- Supporting partners: Steuben County Office of Emergency Services
- Estimated timetable: Annually if possible

Provide swiftwater rescue training for Town Highway Department: Highway Department staff that respond to drainage and flooding problems should have a basic knowledge of swiftwater safety procedures. A local instructor can provide awareness level training.

- Estimated cost: About $300
- Potential funding sources: To be determined
- Project lead: Erwin Fire Council
- Supporting partners: Steuben County Office of Emergency Services
- Estimated timetable: Annually if possible

Prepare flood stage forecast maps for Canisteo River: A priority mitigation recommendation of the Project Impact Committee was to prepare flood stage forecast maps (Priority 8). These maps delineate the areas inundated by specified river levels and are valuable for emergency planning and emergency response. In order to prepare flood stage maps, it is necessary to have an appropriately sited stream level gauge, flood stage profile lines for the water surface, and accurate topographic data. Flood stage forecast maps for the Canisteo River Valley in Erwin can
be developed based on river levels measured upstream at the West Cameron gauge. Updated hydraulic information and high-resolution topographic data will be available when updated Flood Insurance Rate Maps are developed (as part of FEMA’s map modernization program).

| Estimated cost: | To be determined |
| Potential funding sources: | To be determined |
| Project lead: | Steuben County Office of Emergency Services |
| Supporting partners: | |
| Estimated timetable: | After Flood Insurance Rate Maps are modernized (to enable utilization of updated hydraulic and topographic data) |

Prepare flood stage forecast maps for Meads Creek: High priority recommendations of the Project Impact Committee include preparation of flood stage forecast maps (Priority 8) and establishment of gauges and flood stage information for Meads Creek (Priority 9A). Flood stage forecast maps delineate the areas inundated by specified stream levels and are valuable for emergency planning and emergency response. Two real-time stream level gauges have been installed in Meads Creek by Environmental Emergency Services Inc. Flood stage forecast maps for the Meads Creek Valley in Erwin can be developed based on the stream levels measured upstream at the new Meads Creek Road stream gauge. Updated hydraulic information and high-resolution topographic data will be available when updated Flood Insurance Rate Maps are developed (as part of FEMA’s map modernization program).

| Estimated cost: | To be determined |
| Potential funding sources: | To be determined |
| Project lead: | Steuben County Office of Emergency Services |
| Supporting partners: | |
| Estimated timetable: | After Flood Insurance Rate Maps are modernized (to enable utilization of updated hydraulic and topographic data) |

**Preventive Measures**

Update in-town drainage study for Gang Mills area: A priority mitigation recommendation of the Project Impact Committee is to update the Interior Drainage Study for the Gang Mills area, which was prepared in 1976 (Priority 11B). Information in this study is used as a basis for evaluating drainage issues related to development. Because of the extensive development in the Gang Mills area in recent years, the Town is concerned that the hydrologic analyses in the study may no longer form a sound basis for designing stormwater management projects and drainage structures.

| Estimated cost: | $50-100,000 |
| Potential funding sources: | To be determined |
| Project lead: | Town Manager |
| Supporting partners: | |
| Estimated timetable: | When funding is available |

Map existing drainage easements: The Town of Erwin has begun to assemble a GIS database of all new drainage easements acquired by the Town. When staff resources are available, the Town
plans to add previous easements to this database and generate a map of all existing drainage easements throughout the Town. The Code Enforcement Officers and the Planning Board will reference this map when reviewing any adjacent development proposals. The owners of all property with deed restrictions will be informed of their responsibility for maintenance of swales and other drainage structures. The identification of ponds, drainage ways, and retention structures will be an important step toward insuring that all drainage facilities are adequately maintained.

- Estimated cost: To be determined
- Potential funding sources: To be determined
- Project lead: Town Manager
- Supporting partners: 
- Estimated timetable: When funding is available

**Natural Resource Protection**

Implement stream and road ditch stabilization projects: The Town of Erwin and Steuben County Soil and Water Conservation District will continue to implement stream and road ditch stabilization projects that are needed to protect roads, bridges, and developed areas. Some projects can be funded by the County stream program, which provides cost sharing for private property owners. Grant funding will be procured for other projects. Funding will be sought to complete stabilization efforts in the Meads Creek watershed, focusing on the high priority stream reaches and road ditches. The streambank erosion inventory and road ditch assessments that were conducted throughout the watershed will be used to select high priority project locations. Another high priority location is Erwin Hollow Creek, where streambank erosion problems are developing beyond the limits of existing rock riprap. In addition to projects within the Town of Erwin, the Town may also provide in-kind support for stream stabilization projects located upstream in neighboring municipalities.

- Estimated cost: Costs for the high priority projects are under review
- Potential funding sources: Steuben County, Town of Erwin, property owners, grants
- Project lead: Steuben County Soil and Water Conservation District, Erwin Highway Department
- Supporting partners: Upper Susquehanna Coalition
- Estimated timetable: When funding is available

**Property Protection**

Buyout properties on Mill Street Extension: Although the Town of Erwin would like to remove the riverfront houses on Mill Street Extension in Coopers Plains, the owners of these homes are not presently interested in selling their properties. The Town of Erwin will contact these property owners about a property buyout project following any future flood events that cause damage in this area. If any are interested in selling their property, funding will be sought for acquisition and demolition of these flood-prone structures (including one National Flood Insurance Program “repetitive loss property”).

- Estimated cost: To be determined
Structural Solutions

Conduct hydrologic evaluation of the Meads Creek Watershed: A priority mitigation recommendation of the Erwin Project Impact Committee is to design and construct flood control dams in the Meads Creek watershed in order to reduce the peak discharges (Priority 11A). However, sufficient data do not yet exist for siting or design of appropriate projects. Erwin will work cooperatively with the Town of Campbell, Town of Orange, Steuben County, and Schuyler County to jointly seek funding for a hydrologic evaluation of the water retention needs in the Meads Creek watershed. They will evaluate the possibility of applying to the USDA sponsored Small Watershed Restoration Program or Public Law (PL) 566 (administered by the Natural Resources Conservation Service).

- Estimated cost: To be determined
- Potential funding sources: Natural Resources Conservation Service
- Project lead: To be determined
- Supporting partners: 
- Estimated timetable: When funding is available

HAZARDOUS MATERIALS

Establish a radon testing and education program: The Steuben and Chemung County Cooperative Extensions have recommended a shared service arrangement in which the existing Chemung County radon testing program is expanded to include Steuben County. This program currently includes radon education and the distribution of radon test kits to the public at a discounted price. Test results obtained through this program are maintained in a database linked to map locations. In order to reduce the potential health risks associated with residential radon contamination, Chemung County is seeking funding to supplement the existing radon testing 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: Cooperative Extension of Steuben County
- 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. Although this training would probably be held in Chemung County, it would be open to participants from Steuben County as well.

**Estimated cost:** To be determined

**Potential funding sources:** To be determined

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

**Supporting partners:** Cooperative Extension of Steuben County

**Estimated timetable:** When funding is available

### TRANSPORTATION SAFETY

**Procure portable travel advisory signs:** The Project Impact Transportation Committee recommended that three portable travel advisory signs be purchased and placed along the major transportation routes into the Town (I-86 eastbound, I-86 westbound, and Route 15 northbound). These signs would provide motorists with real-time traffic and weather advisories. The messages on the signs are addressable via telephone, enabling remote programming of the messages. The signs would supplement those currently utilized by NYS Department of Transportation and could be moved to other locations when appropriate.

- **Estimated cost:** $75-90,000 for three signs
- **Potential funding sources:** To be determined
- **Project lead:** To be determined
- **Supporting partners:**
- **Estimated timetable:** When funding is available

### WATER SUPPLY CONTAMINATION

**Provide sewer and water service to Long Acres (Victory Highway/Pioneer Drive area):** The Town of Erwin will continue to seek funding for the extension of sewer and water services into flood-prone areas in Long Acres, where water supply contamination has been an ongoing problem. Previous requests and applications to various state and federal programs have so far been unsuccessful. As part of the Town’s continued commitment to bringing this project to fruition, it contracted with the NYS Department of Transportation (DOT) to incorporate the installation of the sleeves necessary to carry sewer and water pipes under Route 415 into DOT’s road widening project. This stage of the project will be funded by the Town’s Capital Project Fund for implementation of the Town’s Comprehensive Development Plan.

- **Estimated cost:** To be determined
- **Potential funding sources:** Under review
- **Project lead:** Town Manager
- **Supporting partners:**
- **Estimated timetable:** When funding is available

**Provide sewer and water service to Coopers Plains:** The Town of Erwin will continue to seek funding for the extension of sewer and water services into the hamlet of Coopers Plains, where
water supply contamination has been an ongoing problem. As part of the Town’s continued commitment to bringing this project to fruition, it contracted with the NYS Department of Transportation (DOT) to incorporate the installation of the sleeves necessary to carry sewer and water pipes under Route 415 into DOT’s road widening project. This stage of the project will be funded by the Town’s Capital Project Fund for implementation of the Town’s Comprehensive Development Plan.

- **Estimated cost:** To be determined
- **Potential funding sources:** To be determined
- **Project lead:** Town Manager
- **Supporting partners:**
- **Estimated timetable:** When funding is available

**Expand the wellhead/aquifer protection program:** The Project Impact Water Source and Supply Committee recommended implementation of an aquifer protection program to prevent contamination of municipal wells and the Corning Area Aquifer. The proposed program targets proper closure of abandoned wells in areas with municipal water, eliminating these pathways for contaminants to reach the aquifer. The components of the recommended program are:

- **Review and enforce the local Aquifer Protection District (1999).** This would identify the requirements within the region identified as tributary to the water supply for the Town. Planning Board involvement and coordination with Corning Incorporated would strengthen this plan.
- **Extend the Town’s wellhead closure program** (which has been established in the Aquifer Protection Overlay Districts #2 and 3) to other areas as service by public utilities is created. The existing program requires proper closure of existing wells (based on NYS Department of Health procedures) as a condition for any new connection to the municipal water system or any demolition. Additional abandoned wells within the recharge areas will be identified, incorporated into a graphic database, and targeted for proper closure.
- **Coordinate the spill prevention plan of Corning Incorporated Sullivan Park with the Town’s plan,** engaging a consultant to ensure that all bases are covered.
- **Develop a fund or access to funds allowing the Town to financially aid owners with closing a well and/or funds to close wells targeted in various areas.**
- **Engage a grant writer to probe for funding of the above program.**
- **Educate the Planning Board, Town Board, and general public about the risk of aquifer contamination.**
- **Analyze the need for well site improvements to reduce the risk of contamination due to vandalism and flooding.**

- **Estimated cost:** $50,000, with additional funds needed for closure of unused wells
- **Potential funding sources:** To be determined
- **Project lead:** Town Manager
- **Supporting partners:** Project Impact Executive Committee
- **Estimated timetable:** When funding is available
UTILITY FAILURE

**Purchase emergency generators for sewer lift stations:** Permanent and portable generators were purchased for Town’s sewer and water systems in 2001 and for the water system booster pumps at Fox Lane and Overbrook Lane in 2004. A remaining vulnerability in the Town’s utility service is the lack of backup power for two sewer lift stations, located on Route 417 (serving Erwin Industrial Park) and at Chatfield Place (serving a major portion of Gang Mills). The Town proposes to purchase generators to supply backup power for these stations.

- Estimated cost: About $10,000 each
- Potential funding sources: To be determined
- Project lead: Town Manager
- Supporting partners: Town Sewer System Operator
- Estimated timetable: When funding is available

**Implement recommendations of the Chemung River Valley Water Study:** The Town of Erwin is among the five Chemung Valley municipalities that participated in a study to determine the best way to provide water to customers in the Chemung River Valley. The municipalities have decided to pursue implementation of the following study recommendations:

- A further engineering study, with collection of the requisite data, to determine the safe yield of the aquifer
- Pursue the implementation of a Water Authority
- Develop a Drought Management Plan and legislation to be adopted by each municipality

- Estimated cost: To be determined
- Potential funding sources: To be determined
- Project lead: Chemung River Valley Water Study Committee
- Supporting partners: Erwin Town Manager
- Estimated timetable: When funding is available
SECTION 8 – PLAN MAINTENANCE

As an officially designated Project Impact Community, the Town of Erwin has made a long-term commitment to mitigating the impacts of disasters. The Town of Erwin Hazard Mitigation Action Plan is a tool that will enable the Town to become progressively more “disaster-resistant.” This plan is an active document that will be periodically reviewed, updated, and revised. The Project Impact Executive Committee, which is comprised of public and private sector members, is responsible for overseeing both implementation and maintenance of this plan. The members of this committee are:

- Town Supervisor, Co-chair
- Corning Incorporated representative, Co-chair
- Town Manager
- Project Impact Coordinator/Code Enforcement Officer
- Administrative Assistant
- Steuben County Director of Emergency Services
- Steuben County Deputy Director of Emergency Services
- NY State Emergency Management Office Regional Coordinator
- President of Hunt Engineers and Architects
- Forest View/Gang Mills Fire Chief
- Town resident

Implementation of this plan involves an ongoing commitment to continue enforcement and implementation of many existing regulations and programs. In addition, the Town plans to continue or initiate the implementation measures identified in Section 6 of this document (Implementation through Existing Programs). Included in this section are specific issues that will be evaluated when comprehensive planning, emergency planning, and land use regulations are revised. The Town will also pursue funding for implementation of the measures identified in Section 7 (Proposed Mitigation Projects). Although many individuals will be responsible for implementing portions of this plan, the process will be overseen by the Project Impact Executive Committee.

The Project Impact Executive Committee will review and update relevant sections of this Hazard Mitigation Action Plan annually. This annual review will focus on those sections of the plan that involve implementation through existing programs (Section 6) and proposed mitigation projects (Section 7). At the time of this annual review, the Executive Committee will evaluate the need for a more comprehensive revision of the Plan. (In order to maintain eligibility for state and federal grant funds, the hazard mitigation plan must be updated at least every five years.)

Additional input for updating the plan will be solicited from the following committees, individuals, and organizations, as appropriate:

- Project Impact Steering Committee
- Project Impact Flood/Flash Flood Committee
• Project Impact Transportation Committee
• Project Impact Severe Weather Committee
• Project Impact Emergency Services Committee
• Project Impact Water Source and Supply Committee
• Project Impact Public Education Committee
• Town Councilpersons
• Highway Superintendent
• Planning Board members
• Residents and businesses
• Steuben County Hazard Mitigation Coordinator (Steuben County Planning Director)
• Steuben County Soil and Water Conservation District
• Regional Flood Mitigation Specialist (Southern Tier Central Regional Planning and Development Board)

The Town 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, 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 Erwin Planning Board will be asked to review each revision of the **Town of Erwin 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 Erwin 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 Erwin Assets
- Table: Age of Residential Structures
- Table: Critical Facilities and Operations Serving the Town of Erwin
- Map: Critical Facilities
- Map: Transportation Infrastructure
- Map: Vulnerable Sites
- Map: Flood Hazards and Problems
- Table: Summary of Flooding Problems (Erwin and Campbell)
- Table: Public/Private Organizations Involved in Hazard Mitigation and Response
Town of Erwin
Current Land Use

Land Use Classification
- Agriculture
- Residential
- Vacant
- Commercial
- Recreation and Entertainment
- Community Services
- Industrial
- Public Services
- State and Forrested Lands
- Streams

0 0.5 1 Miles
## LAND USE
### TOWN OF ERWIN

<table>
<thead>
<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>6,211</td>
<td>26.8%</td>
</tr>
<tr>
<td>Residential (200's)</td>
<td>2,429</td>
<td>10.5%</td>
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<tr>
<td>Vacant Land (300's)</td>
<td>3,767</td>
<td>16.3%</td>
</tr>
<tr>
<td>Commercial (400's)</td>
<td>139</td>
<td>0.6%</td>
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<tr>
<td>Recreation &amp; Entertainment (500's)</td>
<td>414</td>
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<tr>
<td>Community Services (600's)</td>
<td>79</td>
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<tr>
<td>Industrial (700's)</td>
<td>731</td>
<td>3.2%</td>
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<tr>
<td>Public Services (800's)</td>
<td>361</td>
<td>1.6%</td>
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<tr>
<td>Wild, Forested, Conservation Lands &amp; Public Parks (900's)*</td>
<td>9,008</td>
<td>38.9%</td>
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<tr>
<td>Unknown</td>
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<tr>
<td><strong>Total Acres</strong></td>
<td><strong>23,141</strong></td>
<td><strong>100.0%</strong></td>
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</table>

*Includes 4,109 acres of State Land

Source: 2001 Real Property Data  
_Town of Erwin Comprehensive Plan 2010 Update_
## TOWN OF ERWIN 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>
</tr>
<tr>
<td>Agricultural (100's)</td>
<td>39</td>
<td>$2,066,500</td>
<td>$1,319,600</td>
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<tr>
<td>Residential (200's)</td>
<td>1,656</td>
<td>$44,369,425</td>
<td>$173,499,375</td>
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<td>Vacant Land (300's)</td>
<td>414</td>
<td>$11,988,900</td>
<td>$623,875</td>
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<td>Commercial (400's)</td>
<td>93</td>
<td>$8,733,900</td>
<td>$45,951,025</td>
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<td>Recreation &amp; Entertainment (500's)</td>
<td>5</td>
<td>$393,100</td>
<td>$2,253,700</td>
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<td>22</td>
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<td>10</td>
<td>$3,713,800</td>
<td>$48,536,400</td>
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<td>Public Services (800's)</td>
<td>29</td>
<td>$1,013,100</td>
<td>$13,199,565</td>
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<td>Wild, Forested, Conservation Lands &amp; Public Parks (900's)</td>
<td>65</td>
<td>$4,189,450</td>
<td>$171,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,333</strong></td>
<td><strong>$77,909,875</strong></td>
<td><strong>$298,915,840</strong></td>
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</table>

* building assessment is total assessment minus land assessment

Source: 2003 Steuben County real property tax records
AGE OF RESIDENTIAL STRUCTURES
TOWN OF ERWIN

<table>
<thead>
<tr>
<th>Year Built</th>
<th>Number of Residences</th>
<th>Percent</th>
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<tbody>
<tr>
<td>2000-2003</td>
<td>120</td>
<td>7.4%</td>
</tr>
<tr>
<td>1990-1999</td>
<td>262</td>
<td>16.1%</td>
</tr>
<tr>
<td>1980-1989</td>
<td>158</td>
<td>9.7%</td>
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<tr>
<td>1970-1979</td>
<td>293</td>
<td>18.0%</td>
</tr>
<tr>
<td>1960-1969</td>
<td>244</td>
<td>15.0%</td>
</tr>
<tr>
<td>1950-1959</td>
<td>285</td>
<td>17.5%</td>
</tr>
<tr>
<td>1940-1949</td>
<td>105</td>
<td>6.5%</td>
</tr>
<tr>
<td>1930-1939</td>
<td>42</td>
<td>2.6%</td>
</tr>
<tr>
<td>1920-1929</td>
<td>23</td>
<td>1.4%</td>
</tr>
<tr>
<td>1910-1919</td>
<td>13</td>
<td>0.8%</td>
</tr>
<tr>
<td>1900-1909</td>
<td>13</td>
<td>0.8%</td>
</tr>
<tr>
<td>Before 1900</td>
<td>69</td>
<td>4.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,627</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

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

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: New York State Police Zone 3 Substation (located off of Meads Creek Road in the Town of Campbell), Forest View/Gang Mills Fire Department, Coopers Plains/Long Acres Fire Department

Fire Departments: Forest View/Gang Mills Fire Department, Coopers Plains/Long Acres Fire Department, Village of Painted Post Fire Department, mutual aid from neighboring fire departments

Police Departments: Steuben County Sheriff’s Department (stationed in the Village of Bath), New York State Police (Troop E substation located on Meads Creek Road in the Town of Campbell), New York State Police Office of Convenience (at Town Highway Garage on South Hamilton Street)

Steuben County Emergency Management Office (located in the Town of Bath)

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

Dispatch centers: Rural Metro Ambulance Service (in the City of Corning), New York State Police (in the Town of Bath), Steuben County Sheriff’s Department (in the Village of Bath)

Emergency medical and ambulance services: Rural Metro Ambulance Service (based in the City of Corning), Coopers Plains/Long Acres Fire Department

Hospital: Corning Hospital (located in the City of Corning)

Highway Departments: Town of Erwin Highway Garage, Steuben County Department of Public Works (nearest shop is located on Route 415 in the Town of Campbell), NYS Department of Transportation (Regional Office in the City of Hornell; nearest maintenance garage is on Meads Creek Road in the Town of Campbell)
Public schools/shelters:  Erwin Valley Elementary School, Frank Pierce Head Start Center (located in the Town of Campbell), Corning-Painted Post West High School (located in the Village of Painted Post)

Utilities:  4 municipal wells, 4 water storage tanks, wastewater treatment plant, electric transmission system, telephone system, natural gas transmission system

Corning Chapter of the American Red Cross (headquarters located in the City of Corning)

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)

Major transportation routes:  Interstate 86, U.S. Highway 15, State Route 415, State Route 417, Norfolk Southern railroad line, Norfolk Southern railroad switching yard, B&H Rail line, Corning-Painted Post Airport

Facilities with significant amounts of hazardous materials:  Nine facilities in the Town of Erwin have hazardous material inventories that meet the reporting requirements for SARA Title III
Town of Erwin
Transportation Infrastructure

Legend

- 1996-1998 Accidents

- ABANDONED
- LOCAL
- COUNTY
- STATE
- US ROUTE
- PROPOSED

Streams
Railroads

0 0.5 1 Miles
<table>
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<tr>
<th></th>
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<tr>
<td>1</td>
<td>Canisteo River</td>
<td>Near Addison Town Line</td>
<td>Erwin</td>
<td>0</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Canisteo River</td>
<td>Along State Route 417</td>
<td>Erwin</td>
<td>5</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Canisteo River</td>
<td>Inidian Hills Road</td>
<td>Erwin</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Canisteo River</td>
<td>Addison Road</td>
<td>Erwin</td>
<td>2</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Beeman Hollow Creek</td>
<td>Upper Beeman Hollow Road Bridge</td>
<td>Erwin</td>
<td>0</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Beeman Hollow Creek</td>
<td>Beeman Hollow Rd. at unnamed tributary</td>
<td>Erwin</td>
<td>0</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
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<td>7</td>
<td>Beeman Hollow Creek</td>
<td>Troy Road</td>
<td>Erwin</td>
<td>0</td>
<td>x x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Beeman Hollow Creek</td>
<td>State Route 417</td>
<td>Erwin</td>
<td>0</td>
<td>x x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Cole Creek</td>
<td>Troy Road</td>
<td>Erwin</td>
<td>0</td>
<td>x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Tioga River</td>
<td>Golf Course</td>
<td>Erwin</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Tioga River</td>
<td>Indian Hills Road</td>
<td>Erwin</td>
<td>6</td>
<td>x x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
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<tr>
<td>12</td>
<td>Tioga River</td>
<td>Rafferty Road</td>
<td>Erwin</td>
<td>0</td>
<td>x x</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>13</td>
<td>Tioga River</td>
<td>Dam Failure</td>
<td>Erwin</td>
<td></td>
<td>x x</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>14</td>
<td>Mulholland Creek</td>
<td>Unamed tributary along Mulholland Road</td>
<td>Erwin</td>
<td></td>
<td>0 x x</td>
<td></td>
<td></td>
<td>x</td>
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<td></td>
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<tr>
<td>15</td>
<td>Mulholland Creek</td>
<td>Scott Road</td>
<td>Erwin</td>
<td>2</td>
<td>x x</td>
<td></td>
<td></td>
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<td>16</td>
<td>Weaver Hollow Creek</td>
<td>Beartown Road at southern tributary</td>
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<td>1</td>
<td>x x</td>
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<td></td>
<td></td>
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<td>17</td>
<td>Weaver Hollow Creek</td>
<td>Brook Road</td>
<td>Erwin</td>
<td>4</td>
<td>x</td>
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<td>Weaver Hollow Creek</td>
<td>Fox Lane Flume</td>
<td>Erwin</td>
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<tr>
<td>19</td>
<td>Cohocton River</td>
<td>Sedimentation</td>
<td>Campbel/Erwin</td>
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<td>Ice Jams</td>
<td>Campbel/Erwin</td>
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<td>Savona Campbell Rd. near intersection with Green Hill Road</td>
<td>Campbel</td>
<td></td>
<td>0 x x</td>
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<td>Cohocton River</td>
<td>Wood Road Bridge</td>
<td>Campbel</td>
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**DRAINAGE PROBLEMS**

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*same as problem #37
### SUMMARY OF FLOODING PROBLEMS
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<td>All</td>
<td>Flash Flooding</td>
<td>Campbell/Erwin</td>
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</tr>
<tr>
<td>90</td>
<td>Meads Creek/other tributaries</td>
<td>Stream Gauges</td>
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<tr>
<td>91</td>
<td>All</td>
<td>Rain Gauges</td>
<td>Campbell/Erwin</td>
<td>x x x</td>
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<tr>
<td>92</td>
<td>Canisteo River/Meads Creek</td>
<td>Flood Stage Maps</td>
<td>Campbell/Erwin</td>
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<tr>
<td>93</td>
<td>Cohocton River</td>
<td>Campbell River Gauge</td>
<td>Campbell</td>
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### DEVELOPMENT TRENDS

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<th>Municipality</th>
<th>Flooded Areas</th>
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<td>Stormwater Management</td>
<td>Campbell/Erwin</td>
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<td>All</td>
<td>Timber Harvesting</td>
<td>Campbell/Erwin</td>
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<td>Many areas</td>
<td>Shallow Water Table</td>
<td>Campbell/Erwin</td>
<td>x</td>
</tr>
<tr>
<td>97</td>
<td>Many areas</td>
<td>Flood Insurance Rate Maps</td>
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<tr>
<td>98</td>
<td>Canisteo River</td>
<td>Erwin Industrial Park</td>
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<td>x</td>
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<td>Frog Hollow Creek</td>
<td>Area between Frog Hollow Road and Scott Road</td>
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<td>Hamm Road</td>
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### HAZARDOUS MATERIAL SPILLS

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<td>State and Federal Highways</td>
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<td>Railroad</td>
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<td>104</td>
<td>All</td>
<td>Stationary Hazardous Material Sites</td>
<td>Campbell/Erwin</td>
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PUBLIC/PRIVATE ORGANIZATIONS INVOLVED IN HAZARD MITIGATION AND RESPONSE

American Red Cross, Corning 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.”

Steuben County Local Emergency Planning Committee (LEPC): A state-mandated committee of public and private sector representatives that is charged with developing and maintaining the Hazardous Material Emergency Response Plan for the County of Steuben and its included municipalities. The committee also assists local industry with the development of hazardous material response plans, receives Tier II reports from local industry (regarding hazardous chemicals stored or transported within Steuben County), and acts as a resource to local emergency responders during hazardous material incidents. The committee meets bi-monthly to plan for the successful handling of accidental chemical releases within Steuben County.

Steuben County Human Needs Task Force: A task force coordinated by the Steuben County Office of Emergency Services, which includes the Greater Steuben Chapter of the American Red Cross and many human service agencies. During a disaster the task force would be the lead group to handle the human aspects of disaster operations, including coordinated assistance to residents in shelters and mass care facilities. The task force has developed a registry of residents with special needs.

Steuben County Water Quality Coordinating Committee: Representatives from municipalities, agencies, and organizations with involvement in water quality in Steuben County who meet quarterly to coordinate and enhance the efforts of the respective groups. Hazard-related topics that have been addressed by the committee include flooding, streambank erosion, and water supply contamination.
ATTACHMENT B

PLANNING PROCESS DOCUMENTATION

The attached materials include the following:

- Article in the Steuben County Soil & Water Conservation District newsletter describing the flood mitigation planning effort in the Towns of Erwin and Campbell
- Newspaper clippings and flier announcing the public information meeting for the draft *Flood Mitigation Action Plan, Town of Erwin and Town of Campbell* that was held on January 26, 1999
- Handout summarizing the *Flood Mitigation Action Plan, Town of Erwin and Town of Campbell* that was distributed at the public information meeting
- Press coverage of the January 26, 1999 public information meeting
- Certification of the Town of Erwin resolution adopting the *Flood Mitigation Action Plan, Town of Erwin and Town of Campbell*
- Article in *STC Region Today* newsletter describing the Town of Erwin Project Impact program
- Hazard mitigation planning information sheet that was posted in municipal offices during the hazard mitigation planning process
- Newspaper clipping and flier announcing the public information meeting for the draft *Town of Erwin Hazard Mitigation Action Plan* that was held on October 30, 2003
- Town of Erwin resolutions adopting the *Town of Erwin Hazard Mitigation Action Plan* and all subsequent revisions
SOLUTIONS TO FLOODING PROBLEMS IN ERWIN AND CAMPBELL
BY: JANET THIGPEN

The Towns of Erwin and Campbell have prepared a Draft Flood Mitigation Action Plan encompassing the two towns. This plan includes descriptions of the numerous flooding problems throughout both municipalities, long-term goals for addressing these problems, and short-term action items needed to achieve these goals.

As part of the planning process, participation from the two (2) towns evaluated a variety of potential solutions and identified those most applicable to the local circumstances. The goals presented in the plan emphasize the need to prevent additional flooding problems, while implementing measures that protect property currently at risk. The proposed action items are realistic measures that can be undertaken by the Towns, with assistance and funding from other agencies. The plan is intended to be updated annually to incorporate subsequent steps for implementing the flood damage reduction goals.

This plan provides Erwin and Campbell with a framework for coordinated implementation of solutions to flooding problems. It also enables the Towns to qualify for project grants from the recently established Flood Mitigation Assistance Program.

The planning process was facilitated by the Regional Flood Specialist with Southern Tier Central Regional Planning & Development Board and funded by a grant from the State Emergency Management Office. For more information about flood mitigation planning, contact Janet Thigpen at 737-2096.
COOPERS PLAINS

Public meeting will focus on flood mitigation plan

A public meeting on a draft flood mitigation plan for Erwin and Campbell will be held today from 6:30 to 8 p.m., at the Frank Pierce Early Childhood Center on Meads Creek Road.

Sponsored by the Southern Tier Central Regional Planning and Development Board, tonight's meeting will include discussion of flood hazards and problems, projects designed to correct those problems, programs needed to prevent additional flooding and available funding.

The Leader 1/20/99

Tuesday

- Flood Mitigation Action Plan public meeting, Campbell and Erwin Town, 6:30 p.m., Frank Pierce School gymnasium.
You are cordially invited to
A PUBLIC MEETING
on the
DRAFT
FLOOD MITIGATION PLAN
for the
TOWN OF CAMPBELL
and
TOWN OF ERWIN

TUESDAY, JANUARY 26, 1999
6:30 P.M. TO 8:00 P.M.
FRANK PIERCE SCHOOL GYMNASIUM

Learn about:
› Specific locations of flood hazards and problems
  › Projects designed to correct these problems
› Programs needed to prevent additional flooding
› Funding available to help Erwin and Campbell
Flood Mitigation Planning

Town of Erwin & Town of Campbell

The Erwin/Campbell Flood Mitigation Planning Committee has evaluated the communities’ flooding problems and a variety of potential solutions in order to prepare a program of activities that the Towns 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 104 flooding problems or potential flooding problems in the Towns of Erwin and Campbell. This documentation includes problems that have been addressed by the municipalities 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 Towns of Erwin and Campbell were proposed. These goals emphasize the need to implement measures that will prevent additional flooding problems, while protecting the property that is currently at risk.

ASSESS POSSIBLE MITIGATION MEASURES
Committee members reviewed a comprehensive list of possible measures for resolving flooding problems. They identified those solutions that are most applicable to the flooding problems and community needs in the Towns of Erwin and Campbell.

DEVELOP AN ACTION PLAN
The committee prepared an Action Plan, which describes 28 activities that the Towns 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 communities’ 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 Erwin Town Board and the Campbell Town Board for adoption. Adoption of this plan will enable the Towns to qualify for Flood Mitigation Assistance grant funding.
Erwin, Campbell flood action plan set for review

By Patrick Buchnowski
Staff writer

Coopers Plains — The committee evaluating flooding problems in the Towns of Erwin and Campbell is ready to send its report to the government for review.

The Erwin/Campbell Flood Mitigation Planning Committee targeted 104 key areas along creeks and rivers as problems or potential problems in its proposed action plan. The municipalities sought public comment at a meeting Tuesday at Frank F. Pierce School, but other than a dozen representatives from the towns, no members of the public appeared.

The flood mitigation plan was undertaken to increase the chances of the towns winning state and federal monies for flood maintenance projects, most notably along the Concho River and Meads Creek, said Janet L. Thigpen of the Southern Tier Central Regional Planning and Development Board, who helped prepare the plan.

After being reviewed by the state Emergency Management Office and Federal Emergency Management Agency, the towns are expected to adopt the plan this spring, she said.
CERTIFICATE OF TOWN CLERK

STATE OF NEW YORK,  )
COUNTY OF STEUBEN,  )
TOWN OF ERWIN      )

I, RUTH E. CREELEY, TOWN CLERK OF THE TOWN OF ERWIN, NEW
YORK, HEREBY CERTIFY THAT I HAVE COMPARED THE FOREGOING
COPY WITH THE ORIGINAL ON FILE OF THE SAME NOW REMAINING
IN MY OFFICE, AND THAT IT IS A CORRECT TRANSCRIPT
THEREFROM, AND OF THE WHOLE OF SAID ORIGINAL.

RESOLUTION TO ADOPT THE FLOOD MITIGATION ACTION
PLAN FOR THE TOWN OF ERWIN AND TOWN OF CAMPBELL.

IN TESTIMONY WHEREOF, I HAVE HEREUNTO SET MY HAND AND THE
SEAL OF THE TOWN OF ERWIN, NEW YORK, THIS 4TH DAY OF
NOVEMBER, 1999.

[Signature]
RUTH E. CREELEY, TOWN CLERK

[Seal]
The Town of Erwin is building partnerships to address flooding and other hazards through the Project Impact process. Project Impact is a nationwide initiative of the Federal Emergency Management Agency (FEMA) to reduce the threat of natural and man-made disasters. Project Impact is based on three simple principles: (1) preventive actions must be decided at the local level, (2) private sector participation is vital, and (3) long-term investments in preventive measures are essential. The goal is to build "disaster resistant communities" that are able to bounce back from a disaster with far less damage and lost production.

The STC Flood Mitigation Specialist serves on the Town of Erwin Project Impact Steering Committee and chairs the Flood/Flash Flood Subcommittee. The Town of Erwin is particularly vulnerable to flooding, which impacts residents, businesses, and the regional transportation system. Of the 2,500 dwellings in the Town, it is estimated that 200 are in the special flood hazard area. The Project Impact Steering Committee ranked four flood hazards among the nine high priority hazards for the Town.

In order to protect Erwin from future disasters, committees of public and private partners are currently identifying and prioritizing public information and damage prevention projects. Once priorities are established, the community will be faced with the challenge of funding and implementing the recommended mitigation measures. FEMA provides technical expertise and limited funding to implement Project Impact initiatives. Additional monies will be sought from a variety of other sources.

For information about how to be a Project Impact community, contact your county Emergency Management Office or Janet Thigpen, STC Flood Mitigation Specialist (607-737-2096).
Hazard Mitigation Planning for the Town of Erwin

WHAT IS HAZARD MITIGATION PLANNING?

The Town of Erwin 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 Erwin 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. Although the plan will build on the information and recommendations previously assembled for Project Impact, additional input is welcome. Please talk to your municipal officials or call Janet Thigpen at 737-2096.
REGIONAL NEWS

CORNING

Taxpayers group to discuss school debt

The Corning Area United Taxpayers Association will meet at 7 p.m. today at the Corning Natural Gas Corp. conference room on West William Street.

Guest speakers Thomas O'Brien, Megan O'Neil-Haught and Kim Clark of the Corning-Painted Post school board will discuss the state proposition to raise the debt limit for small-city school districts from 5 percent to 10 percent. The proposition will be on the Nov. 4 general election ballot.

A question-and-answer period will follow.

PAINTED POST

Erwin to review disaster plan

A meeting on the town of Erwin's hazard mitigation action plan will be at 7 p.m. today at the Erwin Town Hall, 117 W. Water St.

The town has reviewed suggestions for ways to mitigate damage from 29 hazards that it evaluated and prioritized. The highest priority hazards that pose the greatest threats in the town are flooding, hazardous material in transit and water supply contamination, officials said.

The plan will serve as a basis for decision-making and funding requests, town officials said.
PUBLIC INFORMATION MEETING

TOWN OF ERWIN

HAZARD MITIGATION ACTION PLAN

The Town of Erwin is sponsoring a public information meeting to solicit input on the draft *Town of Erwin 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, October 30, 7:00 p.m.**
Erwin Town Hall
117 W. Water Street, Painted Post

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
CERTIFICATE OF TOWN CLERK

STATE OF NEW YORK,
COUNTY OF STEUBEN,
TOWN OF ERWIN

I, RUTH E. CREELEY, TOWN CLERK OF THE TOWN OF ERWIN, NEW YORK, HEREBY CERTIFY THAT I HAVE COMPARED THE RESOLUTION SET FORTH BELOW WITH THE ORIGINAL OF THE SAME Duly ENACTED ON JANUARY 11, 2005 NOW REMAINING ON FILE IN MY OFFICE, AND THAT IT IS A CORRECT TRANSCRIPT THEREFROM, AND OF THE WHOLE OF SAID ORIGINAL.

RESOLUTION TO ADOPT THE TOWN OF ERWIN HAZARD MITIGATION ACTION PLAN.


RUTH E. CREELEY
RUTH E. CREELEY, TOWN CLERK

Seal
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 Erwin. The hazards are presented in order of priority, followed by a list of the hazards that are not applicable to the Town of Erwin.

#14. 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: One day
- Incident stabilization: More than two weeks of overtime emergency operations
- Potential impact: Serious injury or death is likely 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.

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.

A number of earth fill dams are located in the Town of Erwin. Three of these dams are large enough to require dam safety permits from New York State. The Sullivan Park Detention Dam (owned by Corning Incorporated) is classified as a high hazard dam due to the residential development below this structure. The Corning Industrial Detention Pond (owned by the Town
of Erwin) is classified as a low hazard dam because the damage resulting from failure is not expected to impact developed land. The Erwin Pond Dam (owned by the NYS Department of Environmental Conservation) is currently classified as a low hazard dam; however the Town has requested a reevaluation of this classification in light of the homes and bridge located downstream of the dam on Beartown Road. Inadequate design and maintenance of these man-made structures can result in seepage or overtopping, which may cause dam failure. Other dams exist because of natural phenomena, such as landslides or the work of beavers.

Upstream of Erwin, 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 low hazard dam, the area of inundation could include roads and infrastructure, but no buildings would be at risk. Because these small dams are located in rural areas, they do not constitute a serious threat. 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 Erwin. Arrival times would be about 8 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 Sullivan Park Detention Dam is located upstream of the Fox Lane area of Gang Mills. No inundation map (delineating the area that could be inundated if the dam fails) is available for this structure. The potential inundation area resulting from a worst-case failure of the Tioga, Hammond, or Cowanesque Dam could encompass significant portions of the Tioga and Chemung River valleys, including Erwins, low-lying areas of Gang Mills, and Painted Post.

Estimate of potential losses: The failure of one of the Corps of Engineers dams in the Tioga River Watershed (Tioga, Hammond, or Cowanesque Dam) could cause billions of dollars in damage within the Tioga River Valley in Erwin.

#15. 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: Although there have been recorded earthquakes in Steuben County, the impacts have been minimal.
• In February 2001, the Avoca area of Steuben County was 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 Steuben 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 Steuben County, but would be a rare event.

Potential impact: The Project Impact Severe Weather Committee identified the following potential impacts of an earthquake in the Town of Erwin:
• Public safety and health issues
• Loss of utilities (electric/gas/water/wells)
• Fuel depletions
• Loss/reduction of transportation services
• Structural collapses
• Civil unrest
• Large scale event could strain limited resources
• Fire risk
• Loss/reduction in communication
• Loss of employment
• Loss of business — general economic losses

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 Steuben 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 Erwin 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 Erwin, damages could be as high as $160,000 (based on per capita damages of $30).

#16. 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: This hazard was not assessed during the 2003 HAZNY assessment for Corning area municipalities. The following information is based instead on the 2003 assessment conducted for Steuben County.

- Scope: Large region is vulnerable
- Cascade effects: 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 in large numbers
  Moderate physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: National Weather Service records indicate that Steuben County has experienced two tornadoes 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.

• The two confirmed tornadoes to have impacted Steuben County were associated with separate storm events in the early 1990’s. Both tornadoes touched down in the Town of Prattsburgh. One of these tornadoes destroyed a mobile home, a barn, and several out buildings. Debris from the damaged structures was found more than a mile away.

• A tornado touched down in the Town of Chemung in Chemung County 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. 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. At least one tornado was sighted over Steuben County, but did not touch down in the County. 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).

• Severe thunderstorms with high winds impacted Steuben County in July 2003. Three confirmed tornadoes associated with this storm system occurred in Pennsylvania, one of which was rated at F3 strength (a potentially devastating storm with wind speeds of 158 to 206 mph).

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, Steuben County is expected to experience a tornado an average of once every 10 years. Because these events are localized, the frequency of occurrence in the Town of Erwin would be less.
Potential impact: The Project Impact Severe Weather Committee reported that, “Because the Town of Erwin has several population centers, it would be significantly impacted if it were hit by a tornado or high winds.” They provided the following list of potential impacts:

- Limited warning time
- Structural damage
- Electrical power outage
- Loss/reduction of transportation services
- Loss/reduction of emergency response services
- Loss of communication systems
- Loss of home/business heating systems
- Fuel depletions
- Loss of employment
- Public safety concerns
- Loss of business – general economic losses
- Electrocutions
- Debris clearance
- Loss of refrigeration

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: How-to Guide #2: Understanding Your Risks: Identifying Hazards and Estimating Losses, FEMA No. 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 fare 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. The locations of the Town’s mobile home parks are shown on the Vulnerable Sites map in Attachment A. 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, religious institutions, and gathering places 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 Erwin, 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 Chemung County 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 Erwin is thus estimated to be $11 million.
#17. 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:** 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:** 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:** National Weather Service records for Steuben County indicate that heavy snow occurred 35 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 Steuben 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.
- In the mid-1990’s, a storm involving about 30 inches of snowfall in the Corning area disrupted transportation. County Highway Department crews assisted municipalities with road clearing. Scattered power outages left some people without electricity for several days.
- The Project Impact Severe Weather Committee reported that thaw events have “occurred in the Town of Erwin a number of times over the past several years and thanks only to ‘Mother Nature’ a major disaster was narrowly avoided each time.”

**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, Steuben County experienced heavy snow an average of 3.5 times per year. These events have typically lasted for one to two days.
addition, the Project Impact Severe Weather Committee considers the potential for a thaw event with a major impact on the Town to be “very high.”

Potential impact: The Project Impact Severe Weather Committee identified the following potential impacts of a severe snowstorm in the Town of Erwin:
- Electrical power outage
- Loss of communications
- Loss/reduction of transportation services
- Radio communications interference
- Snow removal
- Loss of business – general economic losses
- Loss of employment
- Fuel depletions
- Loss/reduction of emergency response services
- Public safety
- Roof collapses

Wet, heavy snow could have additional impacts similar to those resulting from an ice storm:
- Loss of home/business heating systems
- Home/business freeze-ups
- Electrocutions
- Debris clearance
- Loss of refrigeration
- Structural damage

The committee identified the following potential impacts of a thaw event:
- Ice jams on rivers and streams
- Flash flooding
- Water ponding and re-freezing
- Loss/reduction of transportation services
- Loss/reduction of emergency response services
- Fuel depletions
- Public safety

Although the Town of Erwin is accustomed to dealing with winter weather, heavy snowfall or blizzards can exceed the normal capacity of highway departments and emergency crews. The most serious incidents generally result from residents who do not heed warnings and attempt to travel. 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 workplaces, 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 Erwin, these impacts, and the associated costs, are considered
to be “normal.”

#18. **DROUGHT**

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

**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:** More than two weeks 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:**

- 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 – December1897)
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
November – December 1949
November – December 1964
September – November 1991

- In recent years, New York State has issued the following drought declarations for Steuben 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. The public water supply systems in the Town of Corning and Village of Addison experienced problems.
- 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. Public water in the Town of Erwin is provided by the Morningside Heights Water District, which relies on water supply wells in the Chemung River Aquifer. This is a reliable and abundant water supply even during dry periods. Drought conditions severe enough to impair the Town of Erwin’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.

#19. 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: Some potential to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- 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 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: National Weather Service records for Steuben County indicate that extreme cold (minimum temperature –10 degrees F or below) occurred 16 times in the twenty years from 1983 to 2002 and extreme heat (maximum temperature 100 degrees F or above) occurred 1 time 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 Steuben County, occurring an average of about once per year and lasting 1 to 7 days. Extreme heat occurs
an average of once every twenty years and lasts 1 to 7 days. These extreme temperature conditions generally impact only a few isolated individuals and do not necessitate emergency response. 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: The Project Impact Severe Weather Committee identified the following potential impacts of extreme cold in the Town of Erwin:

- Public safety and health
- Home/business freeze-ups
- Strain on energy supplies
- Water supply system freeze-ups
- Fire fighting limitations

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.

The Project Impact Severe Weather Committee identified the following potential impacts of extreme heat in the Town of Erwin:

- Drought
- Loss/reduction of water supplies/wells
- Public health issues
- Loss/reduction of electrical power – brownouts/blackouts
- Forest/brush fire risk

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, who may be unable to adequately heat their homes, are concentrated in the mobile home parks indicated on the Vulnerable Sites map in Attachment A. Other 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.

#20. 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:** 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:** 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
  Little or no structural damage to community infrastructure

Past hazard events: A number of explosions have occurred in Steuben County.
- Most explosive events in Steuben County have resulted from natural gas leaks. These events usually result in severe damage to the property involved and trigger fires.
- There have been instances in Steuben 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. Some farmers have old dynamite, which becomes unstable when it crystallizes.
- The southern tier of New York has a high concentration of identified methamphetamine labs. 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, neither is common in the Town of Erwin.

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 $26 million (excluding the land assessment). A major explosion at this industrial facility could cause damages exceeding a million dollars.

### #21. 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:** Some potential to trigger another hazard
- **Frequency:** Rare event (occurs less than once every fifty years)
- **Onset:** No warning
- **Hazard duration:** Two to three days
- **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:** Steuben County has not experienced serious air contamination problems. Ozone alerts were issued during a hot spell during the summer of 2002, but are not common.

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

**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 Erwin are not expected to be severe or prolonged, it is anticipated that the medical consequences will be limited to a small number of people.

### #22. **STRUCTURAL COLLAPSE**

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

**HAZNY analysis:** This hazard was not assessed during the 2003 HAZNY assessment for Corning area municipalities. The following information is based instead on the 2003 assessment conducted for Steuben County.

- **Scope:** Large region is vulnerable
- **Cascade effects:** Some potential to trigger another hazard
- **Frequency:** Rare event (occurs less than once every fifty years)
- **Onset:** No warning
- **Hazard duration:** Four days to one week
- **Incident stabilization:** Three days to one week 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:** Steuben 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.
- Bridges have also collapsed due to erosion damage during flood events or due to improper maintenance.

**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 Erwin 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 and old bridges.

Estimate of potential losses: The credible worst-case building collapse in the Town of Erwin 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.

#23. 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:** Unlikely to trigger another hazard
- **Frequency:** Rare event (occurs less than once every fifty years)
- **Onset:** Several days warning
- **Hazard duration:** More than one week
- **Incident stabilization:** One to two weeks of overtime emergency operations
- **Potential impact:** Serious injury or death is likely in extremely large numbers
  - Moderate physical and/or economic damage to private property
  - Little or no structural damage to community infrastructure

Past hazard events: Influenza outbreaks occur in Steuben County every year, with most of the deaths occurring in the elderly population. For this assessment, these routine flu outbreaks are not classified as epidemics. Additional disease outbreaks that have not reached epidemic proportions include rabies and Hepatitis B. West Nile virus was first detected in dead birds in Steuben 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 epidemics 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 identified 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, Steuben 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: In order to identify an epidemic as quickly as possible, the Steuben County Public Health Nursing Department currently contacts each hospital in the county daily regarding changes in disease populations. 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 Steuben 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 well being of Erwin 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 Erwin (population of 5,385, excluding the Village of Painted Post), this worst-case pandemic could have the following consequences:

- Up to 3,800 persons may be infected (71% of the population);
- Between 750 and 1,900 persons may become clinically ill (14 to 36% of the population);
- Between 320 and 860 persons may require outpatient care (6 to 16% of the population);
- Between 5 and 16 persons may be hospitalized (0.1 to 0.3% of the population);
- Between 2 and 6 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 Erwin, the economic losses that could result from a similar incident could exceed $300,000 in the Town of Erwin.

### #24. 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:** Some potential to trigger another hazard
- **Frequency:** Rare event (occurs less than once every fifty years)
- **Onset:** No warning
- **Hazard duration:** 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:
- A traffic accident involving a motor vehicle carrying low level radioactive material occurred in Chemung County. The integrity of the container was maintained and no release occurred.
- Radioactive material was detected in scrap metal that had been delivered to the Steuben County transfer station in Erwin. The source of this material is not known. The County paid $17,000 to dispose of two barrels of contaminated material.

Probability of future events: A transportation accident involving radiological material could result in the release of radioactive substances. Trains carrying material to and from nuclear power plants may transport radioactive fuels or waste through Erwin. In addition, 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. The probability of that radiological material will be released in the Town of Erwin 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 Erwin, 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 most vulnerable area for a transportation accident involving radioactive materials is the railroad track and switching station. This and other transportation routes through the Town 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 Erwin would be a traffic accident involving a train or vehicle transporting radioactive material. If a train accident involves radioactive materials, the costs associated with testing and decontamination would be the responsibility of the carrier. The disposal cost for the radioactive material left at the Erwin Transfer Station was $17,000.

#25. 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: Rare event (occurs less than once every fifty years)
• Onset: No warning
• Hazard duration: 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
  Moderate structural damage to community infrastructure

Past hazard events: Most labor disputes and public protests in Steuben County occur peacefully.
• Bomb threats have been made to area schools.
• Labor disputes and strikes frequently necessitate increased police scrutiny, but violent incidents have not occurred.

Probability of future events: Civil unrest can be triggered by political protests, labor disputes, 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 Erwin 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 workplaces, schools, 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, religious meeting places, and a movie theater.

Estimate of potential losses: If a riot develops in the Town of Erwin, 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.

#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: Some potential to trigger another hazard
• Frequency: Rare event (occurs less than once every fifty years)
• Onset: More than one week 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
  Moderate structural damage to community infrastructure

**Past hazard events:** There have been no fuel shortages in Steuben County since the OPEC oil crisis in the 1970’s. Temporary problems have developed during prolonged power outages, due to the inability of gas stations without electricity to pump gas, which has resulted in lines at gas stations with electric power.

**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 Erwin Project Impact Coordinator estimates that the business losses resulting from a fuel shortage could reach millions of dollars.

### #27. 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:** Some potential to trigger another hazard
- **Frequency:** Rare event (occurs less than once every fifty 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
  Little or no physical and/or economic damage to private property
  Little or no structural damage to community infrastructure
Past hazard events: The only food shortages to have occurred in Steuben County have been relatively minor events triggered by weather events. Following Tropical Storm Agnes in 1972, food and other emergency supplies were brought into the Erwin/Corning area, but no serious food shortage problems developed.

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 Erwin 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: Based on $300,000 in weekly business for a single grocery store, it is estimated that the economic loss caused by a one week disruption in the food supply could be about a half million dollars.

#28. AVALANCHE

Definition: 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.

HAZNY analysis:
- Scope: Single location is vulnerable
- Cascade effects: Some potential 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: 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: There have been no known avalanche events in the Town of Erwin. In March 1994, heavy snow from a steep slope in the Town of Rathbone buried approximately 1500 feet of County Route 119 under 8 to 9 feet of snow.
Probability of future events: An avalanche is unlikely to occur in the Town of Erwin.

Potential impact: Because of the steep slope construction standards in the Town of Erwin, it is unlikely that any buildings are at risk of avalanche damage. Potential impacts include road closure and damage to above-ground utilities.

Vulnerable areas: The risk of an avalanche is limited to steep slope areas, most of which are undeveloped. There are no areas in the Town of Erwin known to be vulnerable.

Estimate of potential losses: The impacts of an avalanche would be somewhat greater than the heavy snow event that triggered it.

#29. RADIOLOGICAL RELEASE FROM A FIXED SITE

Definition: A release or threat of release of radioactive material from a nuclear power generating station, or research reactor, or other stationary source of radioactivity.

HAZNY analysis:
- Scope: Several individual locations are vulnerable
- Cascade effects: Some potential 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: There have been no known incidents of radiation releases from facilities in Steuben County that utilize radioactive materials.
- Radioactive material was detected in scrap metal that had been delivered to the Steuben County transfer station in Erwin. The source of this material is not known. The County paid $17,000 to dispose of two barrels of contaminated material.

Probability of future events: Erwin 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. No medical or industrial facilities in or near the Town of Erwin utilize radioactive materials in sufficient quantities to require reporting to emergency personnel. 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 Steuben County are unlikely to have access to radioactive materials. The
most significant risk of a fixed site radiological release in the Town of Erwin is posed by unauthorized use of radioactive materials, such as that which led to the illegal disposal of radioactive materials at the Steuben County transfer station.

**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 Erwin, 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:** There are no sites in the Town of Erwin where significant amounts of radioactive material are used or stored.

**Estimate of potential losses:** The disposal cost for the radioactive materials found at the Steuben County transfer station was about $17,000.

**HAZARDS NOT APPLICABLE**

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

- **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 Erwin 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. Steuben 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 Erwin. This hazard is considered above with flooding and flash flooding.

- **Infestation:** Infestation is 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. Although high populations of gypsy moths, mosquitoes, deer, and other animals can cause problems in the Town of Erwin, the risk of an infestation of a magnitude sufficient to require activation of emergency response personnel is considered to be minimal.
• **Landslide**: A landslide is 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. The Town of Erwin 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). Although areas prone to landslides are located in other parts of Steuben County, no landslide prone areas have been identified in the Town of Erwin.

• **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 Erwin.

• **Mine Collapse**: There are no mining activities in the Town of Erwin that involve the excavation of an underground cavity.

• **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 Erwin: riverine flooding, overland flooding and ponding, groundwater flooding, erosion of streambanks, and hazardous material spills in flood-prone areas. Flooding problems can arise from heavy rainfall, rapid snow melt, and ice jams. Flash flooding is common.

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.

Hazardous material spills were addressed as part of the flood mitigation plan because flooding can increase both the probability and the severity of hazardous material releases. The areas with the highest risk for hazardous material spills are along the transportation routes (highways and railroad tracks) and at industrial facilities.

Flood problems occur when development is adversely impacted by flood hazards. Numerous flood problem areas have been identified throughout the Town of Erwin. 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 Erwin.

The most severe flooding problems in the Town of Erwin are from the Cohocton River and Meads Creek. The Cohocton River occupies a broad, flat valley with concentrated residential populations in Coopers Plains and Long Acres. Meads Creek is a northern tributary to the Cohocton River, which has caused repeated flooding problems in the Long Acres area of Erwin. Additional flooding problems occur along the Canisteo River, the Tioga River and numerous tributary streams. Additional water problems result from erosion of stream- and riverbanks, inadequacies of local drainage, and shallow groundwater.

The Town of Erwin has a long history of repeated flood events. The most severe flooding on the Cohocton River and Meads Creek occurred during the “Finger Lakes Flood” in July 1935. This event was the flood of record for both the Cohocton River gauge near Campbell and the Canisteo
River gauge at Arkport. It is estimated that 12 inches of rain fell in the upper Meads Creek watershed in 9 hours. Severe flooding in May 1946 (intense rainfall on previously saturated ground) was considered a 100-year flooding event on the Tioga and Chemung Rivers. Another devastating flood occurred in June 1972 (Hurricane Agnes Flood), resulting in severe damages in the Gang Mills area of Ervin and downstream in Painted Post and Corning. The 1972 event is the flood of record for the Tioga River gauge near Erwin's and was considered greater than a 500-year flooding event on the Tioga and Chemung Rivers. Subsequent flooding has occurred in the Towns of Erwin and Campbell in September 1975 (Hurricane Eloise), June 1976 (“Fathers’ Day Flood”), March 1978, June 1984, April 1993 (“Blizzard of ‘93” snowmelt), August 1994 (Hurricane Beryl), January 1996 (snowmelt and heavy rain), November 1996 (heavy rain), and July 1998 (thunderstorms with heavy rain in Campbell). Ice jams have contributed to additional flooding in 1976 (Gang Mills) and 1979 (Meads Creek Ervin). In addition to these flood events, many additional heavy rainfall events have caused localized drainage problems, ponding, streambank erosion and other difficulties.

The following information excludes descriptions of flood hazards and problems in the Town of Campbell that were included in the Flood Mitigation Action Plan, Town of Erwin and Town of Campbell. This has resulted in omissions in the numbering sequence for the identified flood problem areas.

**RIVERINE FLOODING AND STREAMBANK EROSION**

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 Flood Insurance Rate Maps (FIRMs) for the Town of Erwin identify the areas expected to be inundated by the 100-year and the 500-year flood on the major rivers and 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.

The potential for riverine flooding from some of the Town’s small streams was not evaluated when the Flood Insurance Study and Flood Insurance Rate Maps were prepared. Yet these streams have floodplains and pose 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 Erwin. 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.

**Canisteo River**

The Canisteo River flows eastward through the Town of Erwin to the Tioga River. Flood protection along the Canisteo is provided by two upstream dam projects in Steuben County: the Arkport Dam on the Canisteo River and the Almond Dam on Canacadea Creek. Most of the Canisteo River floodplain in the Town of Erwin is agricultural or undeveloped land. However, old and recent development along State Route 417 is located within the 100-year floodplain of the Canisteo River. Future floodplain development in the Erwin Industrial Park is anticipated.

*Flood Problem #1. Bank erosion:* Extensive river bank erosion occurred on the north bank of the Canisteo River near the Addison Town line. This site was stabilized with willows prior to the 1996 floods.

*Flood Problem #2. State Route 417:* Existing development along State Route 417 that is located within the 100-year floodplain of the Canisteo River includes: 1 industrial facility, 1 municipal well house, 1 farm, and about 5 houses. At least one house has experienced basement flooding in recent years. The well house has been protected with sand bags to prevent flood damages. Additional floodplain development is anticipated in the Erwin Industrial Park (Problem #98).

*Flood Problem #3. Indian Hills Road:* Indian Hills Road has been closed due to flooding by the Canisteo River. The only residential damages in recent years have been to one garage. Water was very close to flooding a mobile home park, located in the 500-year floodplain.

*Flood Problem #4. Addison Road:* Two houses on the south side of Addison Road are located within the 100-year floodplain of the Canisteo River. Several additional homes are located within the 500-year floodplain.

**Beeman Hollow Creek**

Beeman Hollow Creek flows south near the Erwin-Addison Town line into the Canisteo River.
The floodplain is not designated on the FIRM.

**Flood Problem #5. Upper Beeman Hollow Road bridge:** Beeman Hollow Creek washed over the Beeman Hollow Road in 1996, when this road was used as a detour for traffic on Highway 17/15 and Route 415 (both of which were closed at Meads Creek). Detoured traffic drove through the water. When the water receded, it was discovered that parts of the road surface had been washed out. Fortunately, no injuries were sustained.

**Flood Problem #6. Beeman Hollow Road at unnamed tributary:** The box culvert that conveys an unnamed tributary under Beeman Hollow Road requires regular cleaning to remove accumulated sediment and debris. The culvert must be cleaned by hand because it is too small to access with equipment. This maintenance was performed three times in recent years in order to protect the road.

**Flood Problem #7. Troy Road:** Troy Road had to be closed following the November 1996 flood because the culvert at Beeman Hollow Creek was washed out. The culvert has since been replaced.

**Flood Problem #8. State Route 417:** During the November 1996 flood, Beeman Hollow Creek flooded State Route 417 and adjacent agricultural land. It was necessary to restore the creek to its channel so that it would flow under the route 417 bridge. The farmland washed out by this event was subsequently restored.

**Cole Creek**

Cole Creek is a northern tributary to the Canisteo River with a largely undeveloped valley.

**Flood Problem #9. Troy Road:** The culvert that carries Cole Creek under Troy Road has washed out and been replaced.

**Tioga River**

The Tioga River flows northward through the Town of Erwin to its confluence with the Cohocton River (to form the Chemung River). Flood protection along the Tioga River is provided by two upstream dam projects in Tioga County, Pennsylvania: the Tioga-Hammond Dam Project on the Tioga River and Crooked Creek and the Cowanesque Dam on the Cowanesque River. These structures reduce peak flows during flood events and prolong the period in which the river is bank full following each event. About 3 miles of flood control levee on the west side of the Tioga River protect development in the Gang Mills area of Erwin. The Town maintains this levee.

**Flood Problem #10. Golf course:** The golf course on Indian Hills Road experiences repeated flooding from the Tioga River. Although a couple of the buildings are located within the 100-year floodplain, but were not damaged by recent flood events.

**Flood Problem #11. Indian Hills Road:** Indian Hills Road and about ½ dozen houses are located in the 100-year floodplain of the Tioga River. The only recent flood damage has been to a home located right on the bank of the river. About half of the back yard has been lost
due to riverbank erosion. The septic system, well and house are threatened.

**Flood Problem #12. Rafferty Road**: An unnamed eastern tributary to the Tioga River has caused erosion damage near the culvert under Rafferty Road. Two yards have been damaged and the culvert has been replaced.

**Flood Problem #13. 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 Erwin, with arrival times of 10 or more hours. Although the possibility of such an occurrence is considered to be extremely remote, the potential damages could be quite severe.

**Mulholland Creek**

Mulholland Creek is an eastern tributary to the Tioga River, flowing through a sparsely developed rural valley. Bank erosion is an ongoing problem along a southern tributary. The floodplain is not delineated on the FIRM.

**Flood Problem #14. Unnamed tributary along Mulholland Road**: A tributary to Mulholland Creek experiences bank erosion that has washed out Mulholland Road at numerous sites. The culvert under Rodman Road has been damaged. Although the damages have been repaired, the road remains at risk of additional damage.

**Flood Problem #15. Scott Road**: Debris has caught under the railroad bridge over Mulholland Creek and flooded two houses on Scott Road. Scott Road washed out and had to be closed.

**Weaver Creek (also called Beartown Creek)**

Weaver Creek is a western tributary to the Tioga River. The upstream reach of the creek is within a State Game Management Area. The downstream areas are developed along Beartown Road and through Gang Mills. Flood protection in the Gang Mills area is provided by an 8,200-foot channel diversion (Beartown Diversion) and a 7,200-foot earthen levee. These structures are maintained by the Town of Erwin. No 100-year and 500-year floodplains have been delineated.

**Flood Problem #16. Beartown Road at southern tributary**: An unnamed southern tributary to Weaver Creek is carried under Beartown Road in an old, undersized galvanized pipe that is rusting and has begun to collapse. Two federally declared flood disasters in 1996 accelerated the deterioration of this structure. This damage has reduced the culvert’s capacity to pass floodwater and is threatening the integrity of the overlying road. A road ditch that enters the stream at this site experienced serious erosion during these floods and now threatens the road. If failure or blockage of this culvert obstructs stream flow, it is likely to flood at least one home and cause severe damage to Beartown Road.

**Flood Problem #17. Brook Road**: An unnamed northern tributary to Weaver Creek floods 1-4 houses along Brook Road. The channel upstream of this site and the culvert under Fox Lane do not have sufficient capacity to convey a 25-year discharge. The construction of 6
additional houses along this stream has been proposed. The drainage requirements for this new development and the access bridge are under review by the Town.

**Flood Problem #18. Fox Lane Flume:** An unnamed tributary to Weaver Creek is carried underground by a corrugated metal pipe beneath the residential development on Fox Lane, Weston Lane and Chatfield Place. The existing drainage capacity of this system is inadequate (less than the 5-year stormwater flow) and its internal condition is unknown. Turbulence and debris accumulation at the structure entrance reduce the inlet capacity of the flume. The Town removes debris from the trash rack during all heavy rainfall events (about five times each year). Despite these efforts, the flume has a history of overflowing a couple of times each year, flooding or threatening houses near the entrance structure on Fox Lane. The road surface, shoulder, road ditch, and lawns have been damaged. Closure of Fox Lane has eliminated access to 13 houses. One house floods regularly; ten houses are potentially threatened. A debris barrier and four grade stabilization sills were installed upstream of the flume in 1998. However, the flume entrance continues to flood due to the limited capacity of the flume.

**Cohocton River**

The Cohocton River flows southeastward through a broad flat valley in the Town of Erwin. This valley is intensively farmed and contains concentrated residential populations in the hamlets of Coopers Plains and Long Acres. A major highway (State Route 17/US Highway 15) follows the valley. There are no flood control dams in the Cohocton River basin and most of the floodplain development in Erwin is not protected by any flood control structures. A flood control levee on the southwest side of the river in Erwin protects development along Canada Road north of Gang Mills) and the Erwin Sewage Treatment Plant (located at the confluence of the Cohocton and Tioga Rivers). On the northeast side of the river, a levee protects the Village of Painted Post and Highway 17/15 as far west as Erwin Hollow Creek. These levees are maintained by the Town of Erwin and NY State Department of Environmental Conservation. Riverine wetlands upstream in the Towns of Cohocton and Avoca provide some natural flood protection by retarding the flow of water through these areas.

Development in Coopers Plains and Long Acres has repeatedly experienced flooding from the Cohocton River. In most developed areas, the floodwaters tend to be shallow and of low velocity. The flood of record for the Cohocton River at Campbell occurred in July 1935, during the “Finger Lakes Flood.” Flooding from Tropical Storm Agnes (June 1972) also inundated a wide area of residential, commercial, and agricultural land (with soil erosion and crop loss accounting for a major portion of the damage). This section of the Cohocton River has experienced numerous ice jams, many of which have caused flooding of developed areas.

The most recent serious flooding of the Cohocton River occurred during the January 1996 snowmelt. During this flood, the Mill Street extension in Coopers Plains was evacuated. An ice jam developed in the Town of Campbell, upstream of Erwin. Restricted at the Wood Road Bridge in the Town of Campbell diverted water from the channel and away from the Campbell river gauge, which is used for flood warning and evacuation planning. This gauge did not
accurately indicate the severity of flooding during this disaster, and thus impaired the effectiveness of emergency operations. The recurrence interval of the discharge recorded at this gauge was about 20 years. Despite inaccurate data at this gauge, the January 1996 flood was much less severe than the predicted 100-year flood event.

Flood Problem #19. Sedimentation: Sediment buildup within the channel poses problems for the entire length of the Cohocton River in Erwin. Sediment accumulation has led to progressive widening of the river in many locations and the formation of islands. This limits the river’s capacity to carry floodwater and increases the risk of flooding. The shallow channel and islands also inhibit the flow of ice and thus contribute to the formation of ice dams.

Flood Problem #20. Ice jams: Ice jams have formed repeatedly at several sites on the Cohocton River. In 1972, 1981, and 1982, ice jams were removed with explosives. The most frequent sites for formation of ice jams are bridges, where the channel width is decreased and flow is obstructed by bridge supports. Ice jams also develop at bends in the river, islands, and gravel bars.

Flood Problem #35. Coopers Plains More than 100 homes, 2 commercial buildings, and 1 farm in Coopers Plains are located within the 100-year floodplain of the Cohocton River. With the exception of Mill Street (below), Coopers Plains has not flooded since 1972. However, the expected impact of a 100-year flood would be significant. Gravel accumulation at the Coopers Plains railroad bridge has repeatedly reduced the capacity of the channel at this site, necessitating removal by the Town. Following the January 1996 flood, 20,000 cubic yards of gravel were removed.

Flood Problem #36. Mill Street Extension: Eight homes on the Mill Street Extension in Coopers Plains are located right on the Cohocton River in the regulatory floodway. This is the first place in the town to flood. High water necessitates closing this road almost every year. Erosion of the riverbank threatens yards. Although the houses are elevated, some have experienced repeated flood damage. One property on Mill Street Extension has had repeated flood insurance claims and is classified by the National Flood Insurance Program as a “repetitive loss property.” These insurance claims occurred in January 1979 (ice jam) and October 1981. During the January 1996 flood, floating ice knocked loose a stilt supporting one house.

Flood Problem #37. Victory Highway (State Route 415) and Long Acres: The community of Long Acres is located in the combined floodplain of the Chemung River and Meads Creek. Development within the 100-year floodplain includes approximately 250 homes, 9 businesses, and a railroad track. Recent flooding of this area has been attributed primarily to Meads Creek, but flooding from the Cohocton River has been a problem in the past.

Flood Problem #38. Canada Road: The northwest end of Canada Road extends beyond the area protected by a flood control levee. A house at the end of the street is located within the 100-year floodplain and has experienced erosion of land. The Town park is repeatedly flooded, necessitating repairs to the nature trail and ball field.
Meads Creek

Meads Creek flows southward from Schuyler County, through the Towns of Campbell and Erwin to the Cohocton River. In Erwin, the Meads Creek valley is primarily residential. There are no flood control structures in the Meads Creek watershed.

Flood damage from Meads Creek has been an ongoing problem in the Town of Erwin. The most severe flooding in this valley occurred in 1935, when an estimated 12 inches of rain fell in the upper Meads Creek watershed in 9 hours. Meads Creek has caused flood damage to homes, property, and businesses in 1935, 1956, 1972, 1975, 1976, 1980, 1984, 1993, 1995, and 1996. Flood damage was prevented by sand bagging during the Hurricane Beryl flood in August of 1994. On numerous other occasions, water has been over the banks, threatening buildings and damaging property. Deposition and ice or debris jams at bridges have produced backwater effects of greater severity than is predicted on the Town’s Flood Insurance Rate Maps.

Two severe floods on Meads Creek in 1996 (January and November) resulted in flooding of numerous homes and businesses and the closure of major transportation routes. The total documented flood damages from the two floods in the Town of Erwin is approximately $6.7 million.

Meads Creek has been plagued by excessive streambank erosion and the resulting accumulation of sediment and debris within the channel. Reduced channel capacity resulting from this deposition has contributed to repeated flooding problems. The Towns Erwin and Campbell have repeatedly removed gravel from the channel. A gravel bar near the Colonial Coach Mobile Home Park in Erwin was removed seven times between 1988 and 1998, with approximately 500 cubic yards of material removed each time. During both of the 1996 floods, water was diverted from the channel by accumulated sediment and debris in the area north of State Route 17/US Highway 15. Following these events, the channel was reported to have been completely filled with gravel at several locations, causing additional flooding of homes with as little as ½ inch of rain. Gravel and debris have subsequently been removed from the channel and the streambanks stabilized at many sites. Funding for additional stabilization is being sought.

**Flood Problem #51. Streambank erosion:** Channel instability poses serious problems for the entire length of Meads Creek in the Towns of Campbell and Erwin. The resulting erosion threatens development at numerous sites (yards, roads, bridges, buildings, etc.). Streambank erosion also leads to deposition of large volumes of sediment, trees, and debris within the creek channel, seriously limiting its carrying capacity and increasing the risk of flooding.

**Flood Problem #62. BOCES (located in Campbell, but contributes to flooding in the Town of Erwin):** An extremely unstable section of Meads Creek is located on the campus of the BOCES Coopers Education Center (immediately upstream of the Highway 17/15 bridge). Erosion of high banks on the outside of bends in the stream is depositing large volumes of sediment and mature trees into the channel. Gravel is accumulating within the channel and on the inside edges of the bends. The stream is quite wide and lacks a well-defined
low flow channel. During both 1996 floods, water was diverted from Meads Creek at this site due to obstruction of the channel by sediment and debris. This diverted flow flooded downstream areas of Highway 17/15 and Victory Highway. Because water was diverted from the Meads Creek channel, some of the areas flooded were located beyond the predicted limits of the 100-year and 500-year flood. Gravel and trees have been removed from the channel at the BOCES site. In 1997, a section of streambank was planted with willows, but they washed out before becoming established. A project is planned to stabilize the channel at this site and install two debris basins for routine removal of sediment and debris.

Flood Problem #63. State Route 17/US Highway 15 (located in the Town of Campbell): Meads Creek flooding necessitated the closure of State Route 17/US Highway 15 two times during 1996. During both events, floodwaters backed up on the north side of Route 17 and flowed across the divided highway at several locations (near the Meads Creek bridge and farther east). This divided highway handles both east-west (Hwy. 17) and north-south (Hwy. 15) traffic through the area. Closure of this highway, combined with closure of State Route 415 downstream, stranded motorists and hampered emergency operations. Vehicles lined up on the highways for many hours and were unable to go anywhere. The only available alternate route was a secondary gravel road, which also flooded (see Problem #5 above).

Flood Problem #64. Coopers Plains: One home in Coopers Plains has repeatedly experienced first floor flooding from Meads Creek. Interior living space flooded two times in 1996. Two natural gas pipeline facilities in this area are elevated and have not experienced damage.

Flood Problem #65. Victory Highway (State Route 415) and Long Acres (Erwin: Flooding and bank erosion along Meads Creek have caused repeated problems to residential and commercial development along Victory Highway and residential development in Long Acres. The 100-year floodplain includes approximately 70 single family homes, three mobile home parks with a total of 173 units, and 9 businesses. Two additional businesses located out of the 100-year floodplain also experienced flooding in 1996 and 12 stores were unable to operate due to limited access and use of the parking lot for emergency operations. Inventory located outside of the 100-year floodplain (but within the 500-year floodplain) sustained extensive damage at an auto dealership and two mobile home sales sites.

Erwin Hollow Creek

Erwin Hollow Creek is a state classified trout stream that flows south through the Town of Hornby, Town of Campbell, Town of Erwin, and Village of Painted Post into the Cohocton River. It flows through state forestland in the Town of Hornby and Town of Erwin. Erwin Hollow Creek is a flashy stream with extensive bank erosion and a high sediment load. The floodplains are not delineated on the Town of Erwin FIRM. However, upstream in the Town of Hornby, a narrow 100-year floodplain was designated along Erwin Hollow Creek and two unnamed tributaries.
Flood Problem #72. **Erwin Hollow Road**: A high sediment load in Erwin Hollow Creek in the Town of Erwin is attributed, in part, to severe erosion of Manning Ridge Road upstream in the Town of Campbell (Problem #83). Channel and bank instability resulted in damage to Erwin Hollow Road in August 1994, January 1996, and November 1996. Sediment was cleaned from the channel following each of these events, but has accumulated again in 1998. Bank stabilization efforts have included at least three major rip-rap projects on state forest land in the Town of Erwin.

**Monkey Run**

Monkey Run is a Chemung River tributary that flows eastward from Town of Erwin into the Town of Corning. The 100-year floodplain has not been delineated for this stream.

**Flood Problem #73.** **Dibble Road**: A culvert that carries Monkey Run under Dibble Road in the Town of Corning is too small and installed at an inappropriate angle. Water backs up at this site about once a year, causing the road to wash out upstream in the Town of Erwin.

**DRAINAGE PROBLEMS**

Overland flooding 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. The alteration of natural drainage patterns has contributed to sedimentation and flooding problems at several locations in the Town of Erwin.

**Flood Problem #74.** **Beartown Road**: A small wetland in the Weaver Creek drainage area frequently floods the back yards and outbuildings of about 10 houses on Beartown Road. The houses themselves are located above the high water levels.

**Flood Problem #82.** **State Route 415 at Sugar Creek Store**: A drainage swale that carries water from the north side of Route 415 south to the Cohocton River has backed up due to debris accumulation within the drainage way. The resulting ponding necessitated closure of an adjacent business. The debris was removed from this site in 1996, but no provisions have been made to insure long-term maintenance of this drainage swale.

**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 Erwin. 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.

**Flood Problem #84.** **Jacob Drive area of Gang Mills**: Groundwater flooding of basements in the
hamlet of Gang Mills affects houses located near the former channel of Weaver Creek on Jacob Drive (26 houses), Forest View Drive, Field View Drive, and Deerland Avenue (one house has two sump pumps).

**Flood Problem #85.** Beartown Estates in Gang Mills: The Beartown Estates development was constructed from 1991 to 1998 adjacent to a state designated wetland. Each of the 80 new houses in this subdivision has experienced groundwater flooding of the basement. Sump pumps were installed after buyers experienced high water.

**Flood Problem #88.** Coopers Plains, Victory Highway (State Route 415) and Long Acres: In addition to the flood threats from the Cohocton River (Problems #35, #36, and #37) and Meads Creek (Problems #64 and #65), houses in the low-lying areas of Coopers Plains, Victory Highway, and Long Acres areas experience basement flooding from an elevated groundwater table. There are many shallow, hand dug wells in this area and the average depth of all wells is thought to be about 20 feet. Groundwater flooding tends to occur in the spring and fall, with one resident reporting as much as three feet of water in the cellar. Some basements are pumped almost every year. Most of the single family homes in this area have basements and all development relies on septic systems.

**FLOOD WARNING**

Flood warnings in the Town Erwin are provided by the Steuben 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.

Flood warnings for the Canisteo, Tioga, and Cohocton Rivers are based on a network of rainfall and river level gauges. The travel time of peak flows from upstream river gauges to locations in the Erwin area are:

**Canisteo River:**
- Hornell to Painted Post -- 17 hours
- West Cameron to Painted Post -- 13 hours

**Tioga River:**
- Tioga Dam to Erwins -- 8 hours
- Tioga Dam to Painted Post -- 10 hours
- Tioga Junction to Erwins -- 4 ½ to 6 hours
- Tioga Junction to Painted Post -- 6 ½ to 8 hours
- Lindley to Erwins -- 2 to 3 hours
- Lindley to Painted Post -- 4 to 5 hours
- Erwins to Painted Post -- 2 hours

**Cohocton River:**
- Avoca to Campbell -- 5 hours
- Avoca to Painted Post -- 9 ½ hours
- Bath to Campbell -- 2 to 3 hours
Greater warning times can be provided based on a network of rainfall gauges throughout the basin and rainfall forecasts.

The areas expected to be inundated by various flood stages on the Cohocton River are shown on Flood Stage Forecast Maps. These maps are used to identify areas requiring evacuation and to designate evacuation routes. Flood Stage Forecast Maps have been prepared for the Cohocton River throughout the Town of Erwin.

Flood warnings for tributary streams are based on rain gauge data and rainfall forecasts by the National Weather Service. Automated climate stations at Cowanesque Dam and Corning Community College and automated rain gauges in Tuscarora, Urbana, and Big Flats 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 and to the National Weather Service for use in preparing flood forecasts. Additional information is provided by volunteer rain gauge readers who report high rainfall observations to the Steuben County Emergency Management Office.

Flood Problem #89. Flash flooding: The streams in Erwin are highly susceptible to flash flooding, which can occur suddenly with little or no lead time.

Flood Problem #90. Stream gauges: There are no stream gauges or stream monitoring locations on most of the tributary streams that flow through Erwin. The Flood Warning Service has recently installed two stream level gauges on Meads Creek in the Town of Campbell, but these gauges have not yet been calibrated.

Flood Problem #91. Rain gauges: There are no automated rain gauges in the watersheds of any of the streams in Campbell and Erwin. The Flood Warning Service has procured funding for automated precipitation gauges in the Meads Creek watershed, but they have not yet been installed.

Flood Problem #92. Flood stage maps: Flood Stage Forecast Maps are not available for the Canisteo River in the Town of Erwin or for Meads Creek. Both of these areas contain extensive floodplain development that is not protected by levees. Emergency operations would be significantly enhanced by maps delineating the areas inundated by specified stream and river levels.

Flood Problem #93. Campbell River gauge: The Campbell gauge on the Cohocton River is located immediately downstream of the Wood Road Bridge. During the January 1996 flood, water backed up behind this bridge and was diverted around the gauge. The high water mark upstream of the bridge was later surveyed at 1.5 feet higher than the highest level recorded by the river gauge. Steuben County has since installed culverts under the approach to the bridge in order to facilitate floodplain flow through this site and alleviate this problem.
DEVELOPMENT TRENDS

Land uses in the Town and of Erwin are indicated on the Current Land Use map in Attachment A. Extensive residential and industrial development has occurred in the Town of Erwin in recent years. Additional new development is expected to occur in the floodplains, because that is where many of the prime building areas are located. In addition, many owners of floodplain property wish to construct garages and outbuildings. Three proposed development sites in the Meads Creek watershed in the Town of Campbell could compound existing drainage problems and increase flows in Meads Creek.

The Town of Erwin has the most restrictive stormwater management requirements of any municipality in Steuben County. These standards are specified in the *Town of Erwin, Steuben County, New York, Drainage Standards for Land Development*, prepared in 1992.

*Flood Problem #95. Timber harvesting:* Numerous flooding and washout problems have occurred when timber harvesting debris has washed offsite, contributing to plugging of culverts and other drainage problems. The Town of Erwin has enacted timber harvesting regulations in order to insure that appropriate stormwater management practices are implemented during logging operations.

*Flood Problem #96. Shallow water table:* The building code does not protect against the construction of basements below the seasonal high water table levels. Although requirements in the Town of Erwin zoning law attempt to address this issue, the data documenting water table levels at undeveloped sites do not exist.

*Flood Problem #97. Flood Insurance Rate Maps:* Inaccuracies in the Flood Insurance Rate Maps result in the inclusion of some elevated properties in the 100-year floodplain and exclusion of lower flood-prone areas. These inconsistencies diminish public support for floodplain management based on these maps.

*Flood Problem #98. Erwin Industrial Park:* An industrial park on State Route 417 in the Town of Erwin includes sites for industrial development in the 100-year floodplain of the Canisteo River.

HAZARDOUS MATERIAL SPILLS

Floodplain areas in the Town of Erwin are at risk of a hazardous material spill. Dangerous spills are most likely along the transportation routes and at industrial facilities.

*Flood Problem #102. State and federal highways:* State Route 417 passes through the 100-year floodplain of the Canisteo River in the Town of Erwin. Interstate 86/US Highway 15 and State Route 415 pass through the floodplains of the Cohocton River and Meads Creek. Both of these highways were closed due to flooding two times in 1996 and in 2003. The truck traffic is particularly heavy on Interstate 86/US Highway 15, which carries both east-west and north-south traffic through this area. The risk of flooding of these highways increases both the likelihood of a hazardous material spill and the potential
dispersion of contaminants.

Flood Problem #103. Railroad: Railroad tracks in the Canisteo, Tioga, and Cohocton River Valleys all are at risk of flooding and/or erosion damage to the tracks. A flood-related train derailment on any of these tracks could result in the release and dispersal of hazardous materials. Many of the railroad bridges have a history of debris accumulation and/or ice jams: Mulholland Creek (Problem #15), Beartown Diversion of Weaver Creek, Cohocton River in the hamlet of Campbell (upstream of Erwin), Cohocton River in the hamlet of Coopers Plains (Problem #35), and Sugar Creek swale (Problem #82). Fortunately, none of these incidents have resulted in a rail accident at these sites. The Gang Mills Train Yard (located outside of the Tioga River floodplain in an area protected by a dike) had hazardous material spills in 1988 and 1989.

Flood Problem #104. Stationary hazardous material sites: Sites at which hazardous materials are used or stored in flood-prone areas include: Corning Inc. Industrial Die Manufacturing (IDM) facility on State Route 417 (located within the 100-year floodplain of the Canisteo River, Problem Area #2) and the Painted Post Car Mart (has a history of flooding, located near the 100-year floodplain of the Cohocton River and Meads Creek, Problem Areas #37 and #65).
ATTACHMENT E

INFORMATION SOURCES

The following information sources were reviewed and utilized in the preparation of this plan:

PLANS AND STUDIES

Town of Erwin Comprehensive Plan 2010, adopted 1993

Town of Erwin Corridor Management Plan, adopted June 2000 (updates a portion of the Town of Erwin Comprehensive Plan 2010)


Steuben County Comprehensive Emergency Management Plan

Flood Mitigation Action Plan, Town of Erwin and Town of Campbell, Steuben County New York, August 1999

Town of Erwin Revisions to Flood Mitigation Action Plan, Town of Erwin and Town of Campbell, September 2001

Town of Erwin Revisions to Flood Mitigation Action Plan, Town of Erwin and Town of Campbell, February 2002

Draft New York State All Hazard Mitigation Plan, prepared by Mitigation Section, New York State Emergency Management Office, April 2003

Schuyler-Steuben Rural Transportation Needs Study, October 4, 2002

Chemung River Valley Water Study, Town of Erwin, Town of Corning, City of Corning, Village of Painted Post, and Village of Riverside, New York, April 2003

TOWN CODES AND STANDARDS

The Code of the Town of Erwin, Chapter 69, Flood Damage Prevention Law, most recently
updated 2002

_The Code of the Town of Erwin, Chapter 130, Zoning_, most recently revised December 2003 to implement recommendations of the _Town of Erwin Comprehensive Plan 2010 Update_

_The Code of the Town of Erwin, Chapter 112, Subdivision_

_The Code of the Town of Erwin, Chapter 125, Water_

_The Code of the Town of Erwin, Chapter 101, Sewers_ (most recently revised in November 2003)

_Town of Erwin, Steuben County, New York, Drainage Standards for Land Development_, March 1992

**HAZARD INFORMATION**

_How-to Guide #2: Understanding Your Risks; Identifying Hazards and Estimating Losses_, FEMA No. 386-2, August 2001

_How-to Guide #7: Integrating Human-Caused Hazards Into Mitigation Planning_, FEMA No. 386-7, September 2002

_Flood Insurance Rate Map, Town of Erwin, New York, Steuben County_, effective date July 21, 1980

_Flood Hazard and Floodway Map, Town of Erwin, New York, Steuben County_, effective date July 21, 1980

_Flood Insurance Study, Town of Erwin, New York, Steuben County_, 1980

“Hazard Expert” information for the NY State Emergency Management Office HAZNY program

_Town of Erwin Project Impact: minutes of the Town of Erwin Project Impact Steering Committee meetings, Executive Committee meetings, and subcommittee meetings_

_Hazards New York Analysis—Weather Hazards Information for Steuben County, New York_, severe weather statistics assembled by the National Weather Service, January 2003

_Course notes from the Hazardous Weather and Flooding Preparedness Course, prepared by the NY State Emergency Management Office and the National Weather Service, September 2000_

HAZARD MITIGATION INFORMATION

How-to Guide #3: Developing the Mitigation Plan; Identifying Mitigation Actions and Implementing Strategies, FEMA No. 386-3, April 2003

Possible Mitigation Measures by Hazard, information sheet prepared by the NY State Emergency Management Office, January 16, 2003

Town of Erwin Project Impact: reports and meeting minutes for the Town of Erwin Project Impact Steering Committee, Executive Committee, Flood/Flash Flood Subcommittee, Transportation Subcommittee, Severe Weather Subcommittee, Emergency Services Subcommittee, Water Source and Supply Subcommittee, and Education Subcommittee

CRS Coordinator’s Manual and supplements, prepared by the National Flood Insurance Program for the Community Rating System

No Adverse Impact, A Toolkit for Common Sense Floodplain Management, prepared by the Association of State Floodplain Managers, October 16, 2002 Draft

Flood Damage Reduction Measures, Steuben County, NY, HARRP-2000, prepared by NY State Emergency Management Office

Schuyler-Steuben Rural Transportation Needs Study, October 4, 2002