EXECUTIVE SUMMARY

This Delaware County Multi-Jurisdictional All Hazard Mitigation Plan was prepared in response to the Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 requires states and local governments to prepare hazard mitigation plans in order to remain eligible to receive pre-disaster mitigation funds that are made available in the wake of federally-declared disasters. **To restate, by not participating in this process and adopting the resulting plan, municipalities will not be eligible to receive future pre-disaster mitigation funding.** It is also important to remember that pre-disaster mitigation funds are separate and distinct from those federal and state funds used in direct post-disaster relief. The availability of those funds remains unchanged; if there is a federally-declared disaster in Delaware County, the affected municipalities will still receive immediate recovery assistance regardless of their participation in this plan.

Hazard Mitigation is any sustained action taken to reduce or eliminate the long-term risk and effects that can result from specific hazards.

FEMA defines a *Hazard Mitigation Plan* as the documentation of a state or local government's evaluation of natural hazards and the strategy to mitigate such hazards.

However, DMA 2000 effectively improves the disaster planning process by increasing hazard mitigation planning requirements for hazard events and requiring participating municipalities to document their hazard mitigation planning process and identify hazards, potential losses, and mitigation needs, goals, and strategies.

Delaware County Multi-Jurisdictional Planning Process

DMA 2000 requires states to submit comprehensive all hazard mitigation plans to the Federal Emergency Management Agency (FEMA) to be eligible for future pre-disaster mitigation funding. Local entities must also develop plans. To comply, Delaware County and all municipalities in the county have developed and adopted this Multi-Jurisdictional All Hazard Mitigation Plan (see the text box below for the municipalities in the Plan). Once the mitigation plan is completed and approved, the jurisdictions will begin to work collaboratively to address data gaps and implement complementary mitigation actions.

Town of Andes	Town of Kortright	Village of Delhi
Town of Bovina	Town of Masonville	Village of Fleischmanns
Town of Colchester	Town of Meredith	Village of Hancock
Town of Davenport	Town of Middletown	Village of Hobart
Town of Delhi	Town of Roxbury	Village of Margaretville
Town of Deposit	Town of Sidney	Village of Sidney
Town of Franklin	Town of Stamford	Village of Stamford
Town of Hamden	Town of Tompkins	Village of Walton
Town of Hancock	Town of Walton	Village of Deposit
Town of Harpersfield	Delaware County	Village of Franklin

To support the planning process for this all hazard mitigation plan, Delaware County and the participating jurisdictions accomplished the following:

- Developed a planning group (Steering Committee);
- Identified hazards of concern;
- Profiled and prioritized these hazards;
- Estimated inventory at risk and potential losses associated with these hazards;
- Developed mitigation strategies and goals that address the hazards that impact the area; and

- Developed mitigation plan maintenance procedures to be executed upon conditional approval of the plan from the New York State Emergency Management Office (NYSEMO) and FEMA.

As required by DMA 2000, the participating jurisdictions and Delaware County have informed the public about these efforts and provided opportunities for public comment and input on the planning process. In addition, numerous agencies and stakeholders have participated as core or support members to provide input and expertise to the planning process. This All Hazard Mitigation Plan documents the process and outcomes of the jurisdictions' mitigation planning efforts.

Delaware County and the participating jurisdictions intend to incorporate mitigation planning as an integral component of daily government operations through existing processes and programs. A notice regarding the existence of the plan and the location of copies of the mitigation plan has been publicized in the *Delaware County Times* and the plan will be posted on the Delaware County web site and made available for review at local libraries. Updates to the plan will be similarly announced after annual plan reviews and 5-year updates. The Hazard Mitigation Coordinator at the Delaware County Planning Department will be responsible for receiving, tracking, and filing public comments regarding this plan.

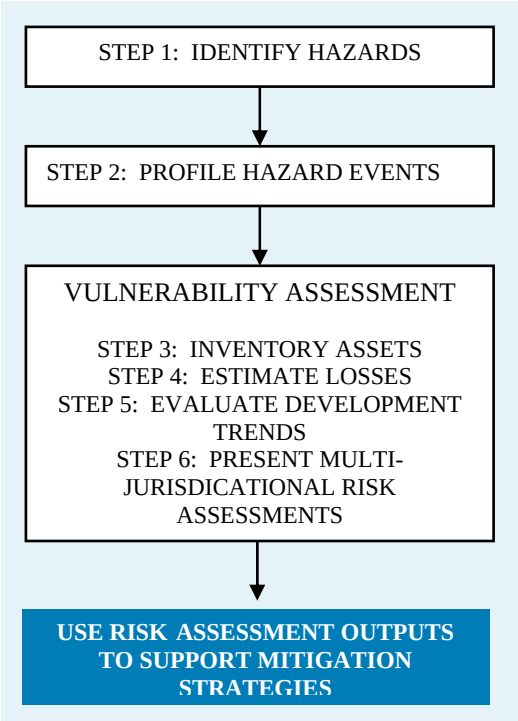
Delaware County Mitigation Plan Adoption

To obtain plan approval, specific prerequisites for plan approval have been met by the participating partners and Delaware County. This multi-jurisdictional mitigation plan will be reviewed and adopted by both Delaware County and each participating jurisdiction. The signatures of the appropriate representatives will be found on page 3-2 of this plan to document formal adoption. Copies of the resolutions regarding adoption of the plan will be included as Appendix A.

Delaware County Risk Assessment to Support Mitigation Plan

A key component of a mitigation plan is the accurate idenfication of risks posed by a hazard and the corresponding impacts to the community. The process of identifying hazards of concern, profiling hazard events, and conducting a vulnerability assessment is known as a risk assessment. The risk assessment portion of the mitigation planning process included the steps shown in Figure ES-1. Each of these steps is summarized below.

Figure ES-1. Risk Assessment Process



Step 1: Hazard Identification

The area considered as the study area for this risk asessment includes the entirety of Delaware County with the exception of the Village of Deposit which straddles the border of Delaware and Broome Counties. The risk assessment process was initiated by implementation of the Hazards New York (HAZNY) analysis, a qualitative ranking system developed by the American Red Cross (ARC) and NYSEMO. HAZNY is an automated interactive spreadsheet designed to evaluate hazards on a statewide basis. The program interface asks specific questions about potential hazards in a community and records and evaluates the responses to these questions. HAZNY also includes historical and expert data on selected hazards. HAZNY is designed specifically for group, rather than individual use.

A full range of natural hazards was considered by the Steering Committee. Initially, some hazards were screened out from consideration based on their low frequency of occurrence in this geographical area; for example, tsunamis and earthquakes were considered to be unlikely and of low potential impact in the area. The HAZNY screening process included consideration of 25 hazards. Delaware County recognized other hazards of concern beyond those included with HAZNY and considered the following initial pool of hazards, many of which are defaults in the HAZNY program: blight, civil unrest, dam failure, drought, earthquake, epidemic, explosion, extreme temperatures, fire, flood, food shortage, hazardous material (HazMat) (fixed site), HazMat (in transit), hurricane, ice jam, ice storm, landslide, mine collapse, severe storm, structural collapse, tornado, utility failure, water supply contamination, and winter storm (severe). All geographically relevant hazards were considered and a list of 12 hazards were selected from the initial pool of hazards. Hazards retained for further evaluation included those with HAZNY scores of at least moderately low severity based on the HAZNY scoring system (i.e., the hazard scored at least 161 points out of a possible 400 using the model).

The order and grouping of the 12 hazards was re-configured by the Steering Committee based on additional research and the professional judgment and evaluation of the planning group regarding the frequency, magnitude, geographic extent, possible direct and cascading effects, impacts to critical facilities and vulnerable populations, and historic costs associated with each hazard. The following list of 12 hazards of concern, in order of significance to the community, was selected for further evaluation in the mitigation plan:

1) Flood
2) Severe Storm (wind, including hurricanes and tornadoes)
3) Ice Jam
4) Severe Winter Storm (snow)
5) Extreme Temperature
6) Ice Storm
7) Infestation (agricultural and disease-carrying insects)
8) Wildfire
9) Drought
10) Epidemic (agricultural)
11) Dam Failure
12) Water Supply Contamination

Of the 12 analyzed hazards, only the flood hazard was ranked as high severity based on the initial HAZNY scoring system. The remaining 11 hazards are considered to present moderate risk.

Step 2: Hazard Event Profiles

As shown above, some hazards initially considered were consolidated with, or separated from, other hazards to avoid redundancy and to facilitate conceptualization of the hazards. The hazards are grouped by their root causes: natural (flood, severe storm, ice jam, severe winter storm, extreme temperature, ice storm, infestation, wildfire and drought); technological (dam failure); and human-caused (water supply contamination). Profiles of these hazards are grouped by these categories in Section 4 and are addressed in order according to the priority of each hazard. Water supply contamination is categorized as human-caused because potential contamination within the Delaware County Multi-Jurisdictional Study Area, particularly within the New York City Watershed, would result from either HazMat impacts or impacts from human-managed agricultural sources.

For each hazard listed above, a hazard event profile presents following information:

1) Background and local conditions
2) Historic frequency and probability of occurrence
3) Severity
4) Historic losses and impacts
5) Designated hazard areas

Other factors considered in the profiling process include the potential impact, onset, frequency, hazard duration, cascading effects and recovery time for each hazard. For this mitigation plan, considerable research was conducted to complete the profiles for the 12 hazards of interest. Where applicable, the source(s) of information and data and maps showing vulnerable areas, relevant community components, and Geographic Information Systems (GIS) coverage also are provided. Table ES-1 summarizes the hazards identified for the Delaware County Multi-Jurisdictional Study Area and those that impact particular jurisdictions. Input from each town and village, the public and local agencies and hazard experts were used to identify specific jurisdictions identified as being more vulnerable to certain hazards.

Table ES-1. Summary of Multi and Single Jurisdiction Risk Assessment Outcomes – Risks of Particular Concern

Hazard	County-wide	Jurisdictions Particularly Vulnerable
Natural Hazards		
Flood	✓	Villages and hamlets along East and West Branches of the Delaware River; Village of Sidney along the Susquehanna River
Severe Storm (wind, including hurricane and tornado)	✓	All
Ice Jam	✓	All
Severe Winter Storm (snow)	✓	All
Extreme Temperature	✓	All
Ice Storm	✓	All
Infestation (agricultural and disease-carrying insects)	✓	All
Wildfire	✓	All
Epidemic (agricultural)	✓	Walton (annual County fair)
Drought	✓	All
Technological Hazards		
Dam Failure	✓	Towns of Colchester, Deposit and Sidney
Man-Made Hazards		
Water Supply Contamination	✓	All Villages and hamlets with public water supplies; NYC watershed

For each hazard, the Steering Committee provided a preliminary overall assessment of the relative risk of that hazard as part of the profile. The overall assessment of each hazard ranges from no concern to severe concern. The Hazard Risk Gauge presented with each profile summarizes the preliminary ranking assigned to each hazard.

Vulnerability Assessment

The vulnerability assessment is summarized below.

Step 3: Inventory of Assets

After a prioritized ranking of hazards of concern was developed, a GIS-based risk assessment methodology called Hazards U.S.-Multi-Hazard (HAZUS-MH) was used to prepare and display the inventory of assets for the multi-jurisdictional study area. The inventory of assets considers the range of resources that could be lost or damaged if a hazardous event occurs. Local data supplemented the HAZUS-MH provided data. Specific assets evaluated for this risk assessment include: population, general building stock (residential and commercial), critical facilities (including, hospitals, schools, police and fire stations), and infrastructure (transportation systems and utility systems).

Step 4: Loss Estimates

Quantitative loss estimates were obtained for the flood and severe storm (hurricane) hazards. Qualitative evaluations were performed for those hazards with limited past event and total loss data. All of the hazards of interest were analyzed using the best available data and FEMA tools and methodologies.

Where quantifiable loss estimates are not yet feasible, comparative evaluations present the types of impacts that could occur, current knowledge of the study area relative to each hazard, and a qualitative assessment of each hazard. For these hazards, future efforts will include the development of additional data so that in the long term, quantitative loss estimates may be feasible.

For this portion of the risk assessment, available data, methodologies, and assumptions were used to select and apply a risk assessment methodology for each hazard. Table ES-2 shows the risk assessment methodologies selected for each hazard.

Table ES-2. Summary of Risk Assessment Methodology Selection

<table>
<tr><th>Hazard</th><th>Comments</th><th>Output</th></tr>
<tr><td colspan="3">HAZUS-MH Methodology</td></tr>
<tr><td>Flood</td><td rowspan="2">HAZUS-MH-provided data were used and supplemented with local data for critical facilities. The HAZUS-MH models were used to obtain exposure and loss estimates.</td><td rowspan="2">HAZUS-MH Exposure and Loss Estimate Maps, Tables and Text</td></tr>
<tr><td>Hurricane (Part of Severe Storm)</td></tr>
<tr><td colspan="3">HAZUS-MH Supported Methodology</td></tr>
<tr><td>Severe Storm (Non-Hurricane Portion)</td><td rowspan="11">Sufficient historic data were not available to forecast the probability of future hazard events. However, available historic and professional expertise regarding areas at risk for each hazard was compiled from a variety of sources. Professional judgment and available data were then used to evaluate past and potential events, and assess risks in a qualitative manner. HAZUS-MH was used to support inventory evaluations and graphical presentations of areas at risk.</td><td rowspan="11">HAZUS-MH Supported Exposure Estimates and Input to Data Needs Portion of Mitigation Strategy (Section 5)</td></tr>
<tr><td>Ice Jam</td></tr>
<tr><td>Severe Winter Storm (Snow)</td></tr>
<tr><td>Extreme Temperature</td></tr>
<tr><td>Ice Storm</td></tr>
<tr><td>Infestation (Agricultural and Disease-Carrying Insects)</td></tr>
<tr><td>Wildfire</td></tr>
<tr><td>Drought</td></tr>
<tr><td>Dam Failure</td></tr>
<tr><td>Water Supply Contamination</td></tr>
</table>

Table ES-3 present the total exposure value for buildings in the flood zone considered "at risk" for both the 100-year and 500-year MRP flood events.

Table ES-3. Estimated Exposure Values for General Building Stock from Floods in Delaware County Study Area

Occupancy Class	100-year Flood		500-year Flood	
	Dollar Value	Building Count	Dollar Value	Building Count
Residential Exposure (Single and Multi-Family Dwellings)	396	$89.9M	422	$99.9M
Commercial Exposure At-Risk	3	$6.8M	4	$11.2M
Industrial Exposure At-Risk	0	NA	0	$0.6M
Educational (Universities)	0	NA	0	NA
TOTAL AT-RISK	399	$96.7M	426	$111.7M

Note: TBD indicates to be determined. NE indicates not evaluated. Dollars rounded to the nearest hundred thousand.

For this risk assessment, loss estimates and exposure calculations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the inventory, or built, environment. Therefore, potential exposure and loss estimates are approximate and do not predict precise results but rather are used to characterize risk and assign priorities for mitigation efforts.

Step 5: Evaluation of Population and Land Use Trends

Development increases population and structures and therefore, can increase the impact of hazards on a community. For example, heavy development planned for a flood-prone area would likely increase the impact of the flood event as time progresses.

Delaware County, located in the Southern Tier region of eastern New York, is situated on the western flanks of the Catskill Mountains and contains a mixture of rural and village landscapes, dramatic terrain and natural features (including portions of the New York City water supply system), and agriculturally productive areas. The Study Area is located between Albany and Binghamton, approximately 100 miles northwest of New York City. The County occupies 1,460 square miles and is home to 48,055 people. (Delaware County and 2000 Census). Since its initial settlement over 200 years ago, Delaware County has remained little changed largely due to its topographic and soil limitations.

This mitigation plan provides a general overview of current and anticipated population and land use within the study area. This information provides a basis for making decisions regarding the type of mitigation approaches to consider and the locations in which these approaches should be applied. This information can also be used to support decisions regarding future development in vulnerable areas. For potential increases in vulnerability, the municipalities can then plan ahead to mitigate those vulnerabilities early in the development process or can direct development to areas of lower risk. The Steering Committee will revisit the mitigation plan regularly to ensure that mitigation strategies support sustainability in order to minimize increased risk and to support the implementation and targeting of specific mitigation actions to address the potential impacts of development over time.

Step 6: Multi-Jurisdictional Risk Assessment

Because Delaware County has prepared a multi-jurisdictional risk assessment, the risk assessment section also summarizes any particular risks faced by individual municipalities adopting the plan. See Table ES-1 for the results of the multi-jurisdictional risk assessment. Losses for each municipality for particular hazards are included in the vulnerability assessment for those hazards, as appropriate in Section 4.4 and are summarized in Section 4.5.

Delaware County Mitigation Strategies

The mitigation strategy portion of the plan includes:

- A summary of past and current mitigation efforts
- Local hazard mitigation goals and objectives
- Identification and analysis of mitigation measures and projects being considered
- Multi-Jurisdictional mitigation strategy (goals and objectives)
- Mitigation action plan (summary of specific activities)

The outcomes of the risk assessment, supplemented by community input, provided a basis to review past mitigation actions, future goals, and appropriate countywide and municipality-specific mitigation strategies. Delaware County identified the following four over-arching mitigation goals or general guidelines that summarize the hazard reduction outcomes that the county wants to achieve:

1. Protect life and property
2. Increase public awareness
3. Encourage partnerships
4. Provide for emergency services

The county developed several corresponding objectives for each goal that further define the specific strategies or implementation steps that will be needed to attain the identified goals. The goals, along with their corresponding objectives, then guided the development and evaluation of specific mitigation activities. The text below summarizes mitigation activity identification, analysis, and implementation.

Identification

Outputs of the risk assessment combined with significant partner, planning group, and public input helped to identify potential mitigation activities. Potential activities were submitted Steering Committee members during the brainstorming sessions such as the meeting of the group on June 22, 2005. Many of the mitigation objectives and action items were identified based on current programs and activities in Delaware County. The mitigation activities developed for this plan are grouped by hazard and presented in a series of tables in Section 5 of this plan.

Analysis

Throughout the mitigation planning process, the mitigation activities were evaluated at the various Steering Committee meetings. At various intervals, members of the planning group met and communicated via email and telephone to analyze mitigation activities for the hazards identified in this plan based on the criteria listed above, current programs and policies, public considerations, and results of the risk and exposure assessments. Each alternative mitigation activity was evaluated qualitatively using several evaluation criteria, including the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) opportunities and constraints of implementation.

Particular attention was given to those mitigation activities that addressed existing and new buildings and infrastructure. Few mitigation activities were removed from consideration based on the concept that it is best not to rule out any activity that may help make the communities more disaster resistant (even if funding was not currently available or an action was a lower priority at present). As a result, only infeasible options were ruled out, including those mitigation actions that were considered to present prohibitive costs, low benefit/cost analysis ratios, or other concerns based on community priorities and needs.

Implementation

Mitigation priority determination considered “the extent to which benefits are maximized according to a cost benefit review” as required by DMA 2000. Priority was also focused to maximize the benefit that

the jurisdictions will gain from the activity. This will help ensure that the funds allocated to these mitigation projects are being spent efficiently. For example, many mitigation activities focus on public awareness and education programs or integrating the mitigation plan into current programs. These types of mitigation measures are more affordable and achievable and have an immediate benefit. The Steering Committee also identified specific projects that will prevent direct future losses. Neither the County nor municipalities have unlimited resources to take on new responsibilities or projects; therefore, mitigation activities that can be implemented through existing programs were considered a high priority. The implementation of new and/or additional mitigation activities is dependent on approval of the local elected governing body as well as obtaining funding from outside sources if funding has not already been secured.

Delaware County Plan Maintenance Procedures

Hazard mitigation planning is an ongoing process. Section 6 of this plan presents procedures for plan maintenance and updates. Therefore, the Steering Committee will continue ongoing mitigation efforts to implement the mitigation plan and revise and update the plan as necessary.

To monitor implementation of the mitigation plan, the planning group members will meet annually to discuss the status of plan implementation and will prepare a summary report of the plan status and any needed updates. The mitigation evaluation will address changes as new hazard events occur, as the area develops, and as more is learned about hazards and their impacts. The evaluation will include an assessment of whether the planning process and actions have been effective, whether development or other issues warrant changes to the plan or its priorities, if the communities' goals are being reached, and whether changes are warranted. In addition, the mitigation plan will be updated at a minimum within the 5-year cycle specified by DMA 2000.

POINT OF CONTACT

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