

**Environmental Assessment  
Bridge Street Bridge over the Bush Kill  
Village of Fleischmanns, Delaware County, New York**

**PW-07990**

**4020-DR-NY**

*December 2015*

# **Appendix D**

## **Environmental Consultations and Studies**

**Resolution/Bridge 101P**

At the Village Board Meeting  
Of the Village of Fleischmanns, New York  
Held at the Skene Memorial Library on  
Monday, May 13, 2013 and

Upon motion made by Benjamin Fenton and seconded by David Yates, the following resolution was duly adopted:

**Whereas**, the Public Works Committee of the Board of Supervisors is doing its utmost to contain costs and develop and infrastructure inventory that the residents of Delaware County can afford to maintain on a sustainable basis, and;

**Whereas**, the flood of August 28, 2011 (Irene) destroyed the Lake Switzerland pedestrian bridge over Vly Creek and the Bridge Street Bridge over the Bushkill, and;

**Whereas**, the Public Works Committee of the Board of Supervisors decided that it would not replace either of these structures because there are reasonable alternate routes around these structures and the reconstruction of the subject structures would result in continued constrictions to flood flows, and

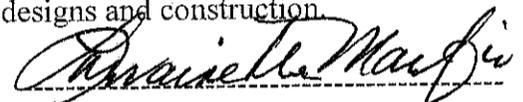
**Whereas**, the Committee decided to use the FEMA money appropriated for the replacement of these structures for alternate projects in the Village that would improve other County infrastructure and make it more flood resilient for the protection of the Village, and;

**Whereas**, the Village of Fleischmanns has decided that the replacement of pedestrian structure at Lake Switzerland and the construction of a pedestrian bridge to replace the Bridge Street Bridge are both critical to the economic sustainability of the Village and to the implementation of the Villages master plan.

**Now Therefore Be It Resolved** that the Village Board herewith commits to assuming complete ownership and maintenance responsibilities for both structures after the County reconstructs the two structures, and

**Be It Further Resolved** that the Village will hold the County harmless of any future costs associated with the future ownership and maintenance of the structures, and

**Be It Further Resolved** that the Village Board will provide a liaison to the Delaware County Department of Public works to attend all design meetings and make decisions required for the timely advancement of the project designs and construction.



Lorraine DeMarfio, Village Clerk  
Village of Fleischmanns

Dated: May 13, 2013

State of New York )  
  )ss:  
County of Delaware )

I, Lorraine DeMarfio, Village Clerk of the Village of Fleischmanns, New York, do hereby certify that the foregoing is a true and correct transcript of a resolution adopted by the Board of Trustees of the Village of Fleischmanns, New York on May 13, 2013 and the whole thereof.



Lorraine DeMarfio, Village Clerk  
Village of Fleischmanns

**ATTACHMENT B**  
**SCOPE OF SERVICES**  
**LOCAL FLOOD HAZARD MITIGATION ANALYSIS (LFHMA)**  
**AND**  
**FEASIBILITY ANALYSIS FOR INUNDATION-RELATED FLOOD HAZARD**  
**MITIGATION PLANNING**

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**PHASE I – FLOOD ENGINEERING ANALYSIS**

***Task 1 – Project Management, Coordination, and Meetings***

In this Phase, the Village of Fleischmanns and The East Branch Flood Commission will better understand the nature of flooding, what significant factors exacerbate flooding, consider options for reducing losses, model potential projects to mitigate flooding, document community opinions about these options, and decide whether to proceed to Phase 2 for a subset of projects that stand out as potentially effective and feasible based on Phase 1.

- 1.1 Throughout the course of the project, the consultant will coordinate tasks; perform project-related managerial tasks; maintain project records, technical data, drawings, and reports; maintain financial records; and coordinate with the Village Board, the East Branch Flood Commission, and/or their appointed designees.
- 1.2 **Project Initiation:** The Village of Fleischmanns is a member of the established East Branch Flood Commission. The consultant will meet and collaborate with the Village Board and the East Branch Flood Commission. The consultant will engage and communicate with these project stakeholders in support of the overall process, which will include explaining the engineering analysis and its results. The consultant will solicit input from project stakeholders relative to the identification of flooding threats and potential mitigation strategies to be included as part of the analysis, as well as prioritizing recommendations based upon the results of the LFHMA. Where possible, the process should be integrated with similar or ongoing efforts, such as the creation of All Hazard Mitigation Plans.
- 1.3 **Educational Materials:** The consultant will prepare general and technical educational materials, as well as participate and contribute to ongoing education and outreach efforts regarding the LFHMA.
- 1.4 **Public Meetings:** Prepare for and attend a minimum of two (2) public information meetings. The purpose of these meetings will be to gather information from property owners about specific flooding issues and to communicate the project analysis and results. The purpose of the first meeting will be to describe the scope of the local flood hazard mitigation analysis (LFHMA) and solicit input relative to historic flooding and property damage. The purpose of the final meeting will be to present the preliminary findings of the analysis and invite participants to weigh in on the mitigation alternatives.

- 1.5 **Planning Meetings:** Prepare for and attend a minimum of four (4) Village Board meetings and (at the option of the Village Board) four (4) East Branch Flood Commission meetings.
- 1.6 Throughout the project duration, coordinate with Village Board, the Flood Commission, and/or their designees, to provide monthly written and verbal project updates and technical information.
- 1.7 Provide additional educational support activities and materials as determined by the Village Board, the East Branch Flood Commission, and/or their designees.

### **Task 1 Deliverables**

- Preparation for and attendance at two (2) public meetings;
- Preparation for and attendance at four (4) Village Board meetings and four (4) East Branch Flood Commission meetings;
- Meeting minutes;
- Periodic project updates to the client;
- Educational support materials;
- Complete set of all records including any digital copies of any model files, maps, datasets, GIS map layouts, survey records, AutoCAD files produced for this project; and
- Record of time spent on each task in an invoicing format consistent with the LFHMA grant funding agreement.

### **Task 2 –Data Collection and Field Verification**

- 2.1 Gather, compile, and review existing available mapping and aerial photography of the river channel and floodplain as well as information regarding potentially flood-prone structures, infrastructure, and water quality threats located along the river corridor and within the floodplain. The following information (if available) will be provided by Delaware County for use in the analysis:
  - a. Available construction drawings of bridge crossings and structures;
  - b. Available aerial photogrammetry, topographic mapping, LiDAR based DEM and/or GIS data of the project area;
  - c. FEMA Flood Insurance Study, Flood Insurance Rate Maps (FIRMs), and HEC-RAS modeling;
  - d. Depth grids available from the FEMA Flood Insurance Studies, if available
  - e. Reports of flooding that have been compiled and documented by the local community or county;
  - f. Water quality reports that have been compiled and documented by the local community, the county, or NYCDEP;
  - g. Prior reports and analyses that may be available;
  - h. The community's all-hazard mitigation plan (including the county-wide all-hazard mitigation plan, other multi-jurisdiction plans, a community annex, or a single-jurisdiction plan if applicable);
  - i. Stream Management Plan, if available; and

- j. Stream Feature Inventory, if available.
- 2.2 Compile a list of resource material from Task 2.1 and submit an electronic copy of same. Periodically update the list as it is expanded.
- 2.3 Conduct a visual assessment of the river channel and floodplain in the project area. The assessment will include identification of low lying structures, bank and channel conditions, and vegetation along the stream corridor. Photo-document channel reaches. Identify significant storm drainage discharge points into the stream and locations of known or suspected inadequate road drainage conveyance.
- 2.4 Perform a “windshield survey” to observe the watershed and site conditions.
- 2.5 Identify potential sources of water quality impairment within the study area that could result from flood discharges, such as household contaminants, roadway contaminants, stream bank and bed erosion, fuel tanks, and other sources as appropriate to the project area. Document any known historic impacts to water quality that resulted from flooding.
- 2.6 Prepare a technical memorandum summarizing data, mapping, and information obtained in Tasks 2.1 through 2.5. Identify any constraints and/or deficiencies in the existing database, including known changes in the system that have occurred following data collection. Evaluate the vulnerability of the system under study to potentially undergo rapid changes.

### **Task 2 Deliverables**

- List of resource materials gathered; and
- Technical memorandum of existing conditions.

### **Task 3 – Hydraulic Modeling Baseline**

- 3.1 Obtain the most recent FEMA modeling (Effective Model) in digital format for use in evaluating possible mitigation measures. The model must be obtained either directly from FEMA or as provided by FEMA to the state, county or local community.
- 3.2 Import the FEMA model into HEC-RAS software to develop a "FEMA Duplicate Effective Model" model<sup>1</sup>. This is necessary to demonstrate the reproducibility of the model results obtained by FEMA on the consultant’s equipment/software. Compare output with published FEMA data and identify any discrepancies. This modeling effort will be conducted in accordance with FEMA requirements.

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<sup>1</sup> If HEC RAS is not used, the consultant must use another FEMA approved modeling software and provide justification why HEC RAS is not appropriate for the analysis (attach list).

- 3.3 Review the FEMA model cross sections; Manning's 'n' coefficients, site conditions, and expansion/contraction coefficients to ensure that the information in the Effective FEMA model and the FEMA Duplicate Effective Model accurately reflect site conditions. If warranted, prepare a "Corrected Effective Model" to modify the Duplicate Effective Model. This modeling effort will be conducted in accordance with FEMA requirements. Acquisition of additional survey or topographic information is not permitted.
- 3.4 Run the model for the 2-, 10-, 25-, 50-, 100-, and 500-year flow conditions utilizing FEMA published flows. Undefined flow conditions (i.e. 2-year and 25-year) shall use USGS regression analysis.
- 3.5 Import floodplain shape files from available GIS and FEMA data and present the existing floodplains on available LIDAR based DEM or GIS mapping of the stream channel corridor on the most recent available aerial imagery.
- 3.6 Identify and map flood-prone properties and infrastructure (i.e. roads, bridges, utilities, etc.).
- 3.7 Prepare a technical memorandum summarizing Tasks 3.1 through 3.7.

### **Task 3 Deliverables**

- Electronic versions in HEC-RAS of all model input and output (presentation of analysis to be provided in Task 6);
- Technical memorandum;
- Inundation mapping; and
- Flood-prone property mapping.

### **Task 4 – Evaluate Mitigation Alternatives**

- 4.1 Working with the Village Board and the East Branch Flood Commission, and consulting the existing Delaware County Multi-Jurisdictional All-Hazard Mitigation Plan (2013), identify flood mitigation goals and objectives, and develop potential actions for the following categories of flood hazard mitigation:
  - a. Property Protection – Actions that reduce potential damage to buildings, infrastructure and other kinds of physical property (including property acquisition/relocation, elevation or flood proofing of buildings).
  - b. Flood Damage Prevention and Planning - Actions that lower flood water elevations or prevent future losses (such as channel and floodplain modifications, floodplain reclamation, and adoption or amendment of land use regulations, building codes or flood damage prevention regulations).

- c. Natural Resource Protection - Actions that minimize hazard loss and preserve or restore the function of natural systems (such as soil stabilization measures such as bank protection and stabilization or landslide stabilization, attenuation of peak flows through detention and enhanced storage, debris management).
- d. Structural Projects - Actions that use or modify structures to mitigate a hazard (such as replacement or retrofit of bridges and culverts, protection of critical utilities and infrastructure).
- e. Emergency Services – Actions that protect people and property during and immediately following a flood.
- f. Community Pollution Prevention – Actions at the community scale that reduce pollution during a flood event (such as securing oil and propane tanks).
- g. Public Education and Information– Education efforts centered on the benefits of general best management practices, to code enforcement officers, realtors, contractors, municipal officials and property owners about how to protect themselves and the community from flood disasters and associated losses.

4.2 Using the modeling from Task 3, develop, analyze and evaluate potential structural flood mitigation in an attempt to decrease or alleviate flooding and flood related damage in populated areas using technically and economically justifiable alternatives. Such evaluation may include the following:

- Replacement or retrofits of bridges or culverts;
- Removal or relocation of structures, buildings, or channel encroachments;
- Channel and floodplain modifications;
- Floodplain improvements or reclamation; and
- Assess the statistical flood events that such mitigation alternatives protect against.

#### 4.2.1 Project Limits:

- The main stem of the Bush Kill from the NYS 28 Bridge (east of the intersection of NYS 28 and Old Route 28) east to its beginning (the confluence of Vly Creek and Emory Brook).
- Vly Creek from its confluence with Emory Brook northeast to Bridge 37-1 on Delaware County Route 37.
- Emory Brook from its confluence with Vly creek southeast to the Main Street bridge at the Fleischmanns village line.
- Little Red Kill from its confluence with the Bush Kill north to the Fleischmanns village line (between Snyder Avenue and Paradise Camp Road).
- Big Red Kill from its confluence with the Bush Kill east to approximately ¼ mile west of the Fleischmanns village line (behind the area of Kissimmee Road).

### **Task 5 –Flood Engineering Analysis and Report**

- 5.1 Prepare a draft local flood mitigation plan that documents the results of Tasks 1 through 4. It is anticipated that the plan will include the information and analysis contained in the numerous technical memoranda developed in previous tasks. Specifically, the plan will include the following:
- Summary of public outreach process and results;
  - Narrative and mapping to present existing conditions, including results of field assessment;
  - Mapping of inundation areas and flood-prone;
  - Alternatives analysis, including feasibility;
  - Narrative and mapping of hydraulic modeling, including a summary of model output relative to forecast reductions in flood inundation areas, depth of flooding, and water surface elevations;
  - Inundation mapping and flood profiles (for all relevant existing and proposed flood conditions including the 100-year event);
  - Recommended mitigation actions;
  - Preliminary benefit cost analysis;
  - Implementation plan and prioritization of mitigation actions;
  - Recommendations for future analysis; and
  - List of reference and resource materials.
- 5.2 Provide paper and electronic (pdf) copies of the draft plan for review by the Village Board, the East Branch Flood Commission, and/or their appointed designees and funding agencies.
- 5.3 Meet with the Village Board, the East Branch Flood Commission, and/or their designees, to present draft findings and implementation plan and recommendations for review, revision, and approval for certain projects to proceed to Phase 2.
- 5.4 Modify and revise the flood mitigation plan based on review comments and provide the final plan in paper and electronic (pdf) format.

### **Task 5 Deliverables**

- Draft Flood Engineering Analysis Report;
- Preparation and attendance at Village Board meetings and the East Branch Flood Commission meetings; and
- Final Flood Engineering Analysis Report.

### **PHASE 2 – FEASIBILITY ANALYSIS**

In this Phase, the consultant will explore in detail the costs, benefits and feasibility of each option deemed in Phase 1 as having a flood inundation reduction or water quality benefit and as

acceptable to the Village Board and the East Branch Flood Commission. Phase 2 will culminate with a plan for implementing the projects which are deemed by the community to be viable.

**Task 6 – Local Flood Hazard Mitigation Feasibility Analysis and Plan**

- 6.1 Working with Village Board and their designees, review municipal regulations concerning zoning, subdivision of land, and flood damage prevention to verify compatibility with NFIP regulations and determine where modifications may be feasible.
- 6.2 Using the FEMA BCA toolkit, determine the benefit cost ratio (BCR). Where site-specific information is available (i.e. cost of response or repairs, such as damage to flooded structures and the contents of such structures; the lost functions of roads, utilities, and services; and the time and costs incurred to clean up from flooding and repair facilities and infrastructure), the damage frequency assessment module will be used. Otherwise, the flood module will be used, with default values.
- 6.3 Identify potential water quality benefits and give general enumeration of scale of benefits for each feasible option defined in Tasks option. The reservoir basin, its status with respect to various pollutants, and the specific pollutants mitigated will be taken into consideration. The following is an example of the enumeration:
  - Number of residential structures mitigated;
  - Number of commercial structures mitigated; and
  - Number of tons of sediment from erosion mitigated.
- 6.4 Identify likely funding sources for the feasible mitigation alternatives.

For recommendations with a potential benefit-cost ratio of greater than 1.0 using the FEMA BCA toolkit, identify funding sources for mitigation actions such as FEMA’s Pre-Disaster Mitigation (PDM), Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA), Repetitive Flood Claims (RFC), Severe Repetitive Loss (SRL), Stream Management Implementation Program, and CWC Flood Hazard Mitigation Implementation Program; and determine which programs are most appropriate based on the type of recommendation and the funding available from each program at the time of analysis.

For recommendations benefit-cost ratios less than 1.0, identify relevant funding sources including, for example the following programs administered by the U.S. Army Corps of Engineers: Small Flood Damage Reduction Projects (Section 205 of Flood Control Act), Emergency Stream bank and Shoreline Protection (Section 14), and Clearing and Snagging Projects (Section 208), Stream Management Implementation Program, and CWC Flood Hazard Mitigation Implementation Program. Also identify recommendations that may fit the “5% Initiative Project” class under HMGP (projects that are difficult to conduct a benefit-cost analysis but meet the goals and objectives of local hazard mitigation plans).

- 6.5 Update of the implementation plan and prioritization of mitigation actions based on 6.1-6.4. Present update to the Village Board and the East Branch Flood Commission.
- 6.6 In close coordination with the Village Board, the East Branch Flood Commission, and their designees, prepare a Local Flood Hazard Mitigation Plan that includes and documents the results of Tasks 6.1 through 6.5. Specifically, the plan will include the following:
- Assessment of local regulations currently in force and their adequacy relative to flood prevention and protection;
  - Discussion of known historic and potential sources of water quality impairment within the study area;
  - Mapping of inundation areas and flood-prone and flood-damaged properties;
  - Assessment of available funding;
  - Implementation plan and prioritization of mitigation actions;
  - Recommendations for future analysis, including hydrologic assessment and/or two-dimensional hydraulic modeling; and
  - List of reference and resource materials.

#### Task 6 Deliverables

- Final Local Flood Hazard Mitigation Plan delivered to the Village Boards, the East Branch Flood Commission, and/or their designees and funding agencies.

## POTENTIAL SUPPLEMENTAL TASKS

The following tasks may be requested to supplement the initial assessment and can be added with approval from the Village Board and the DCSWCD.

- P2.1 Identify and map flood-damaged properties and infrastructure (i.e. roads, bridges, utilities, etc.), including those located outside of special flood hazard areas, repetitive loss properties (RLPs), and severe repetitive loss properties.
- P2.2 Working with the local floodplain administrator, characterize and categorize flood-prone and flood-damaged properties into groups based on types of damage suffered, use (i.e. residential vs. non-residential), building or structure type (basement, crawlspace, slab on grade, number of stories, etc.), types of accessory structures on the properties, and location of building utilities relative to basements and first floors. If known, determine whether damage resulted from flood inundation, avulsion, or slope failure. Develop a database of such properties by address.
- P2.3 Working with the local floodplain administrator, and to the extent that data is available, determine which flood-prone and flood-damaged properties are insured under the National Flood Insurance Program (NFIP) and which are not insured.
- P2.4 Utilize HAZUS to evaluate cost-effectiveness.
- P2.5 Prepare information to estimate the social and economic impacts of select options identified during the analysis and planning phases. Such information might include identification of potential impacts to business community, residents, property values or the local tax base.
- P2.6 Prepare SEQR documents to enable the municipality to adopt the plan if desired by the municipality.

## 9.21 VILLAGE OF FLEISCHMANN'S

This section presents the jurisdictional annex for the Village of Fleischmann's.

### A.) HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact	Alternate Point of Contact
Carl Patrick Davis, CEO/ZEO 42339 State Route 28, Margaretville, NY 12455 845.586.2344 <a href="mailto:middbldgzon@catskill.net">middbldgzon@catskill.net</a>	Lorraine DeMarfio, Village Clerk 1017 Main Street, Fleischmann's, NY 12430 845.254.5514 <a href="mailto:village39@catskill.net">village39@catskill.net</a>

### B.) VILLAGE PROFILE

The Village of Fleischmann's is located in eastern Delaware County, within the Town of Middletown. Vly Creek and Emory Brook join in the Village to form the Bush Kill. The Little Red Kill flows into the Village from the north and into the Bush Kill just downstream of the Vly Creek/Emory Brook confluence. The Bush Kill is a tributary of the East Branch of the Delaware River.

The Village is governed by a mayor and four member Village Board. The Village of Fleischmann's has a total land area of 0.68 square miles. Of this area, 0.67 square miles is comprised of land and 0.1 square miles are lands under water.

According to the U.S. Census, the 2010 population for the Village was 351<sup>1</sup>. State Route 28, the major east-west transportation artery through the County, runs through the Village.

The range of elevation in the Village is approximately 460 feet. The lowest point is 1,480 feet above **mean sea level (msl)** in the vicinity of Depot Street along Emory Brook. The highest point is 1,940 feet above msl in the vicinity of Fleischmann Heights. Within the Village, elevation is what separates those areas that lie within the floodplain and those that are not in the floodplain. Steep slopes are located along the edge of Emory Brook<sup>2</sup>.

### Hazard Vulnerabilities in the Village

The following section discusses the hazard vulnerabilities within the Village of Fleischmann's. Complete profiles of all hazards of concern are included in Section 5 of this Plan. Potential losses from Flood and Severe Storm were modeled using FEMA's **Hazards United States-Multi-Hazard (HAZUS-MH)** software. HAZUS-MH uses Geographic Information Systems technology to estimate physical, economic, and social impacts of disasters<sup>3</sup>. For details regarding the methodology used for the vulnerability assessment, the Village's vulnerability to each of the hazards assessed and for further explanation of the tables included below, please refer to the appropriate hazard profiles in Section 5.4 of this Plan. For details regarding specific disaster events that have impacted the Village, please see Section C of this document, "Documented Losses to Natural Hazard Events Specific to the Community".

<sup>1</sup> U.S. Census, 2010

<sup>2</sup> Village of Fleischmann's Comprehensive Plan

<sup>3</sup> <http://www.fema.gov/hazus>

## ***Flood***

### Flood-prone areas

Of the Village's total land area, 0.1 square miles are located within a FEMA-defined 1% annual chance (100-year) flood boundary.

It is important to note that not all flood hazard areas within Delaware County are identified in the Delaware County **Flood Insurance Study (FIS)** or on the **Flood Insurance Rate Map (FIRM)**. Identified flood hazard areas vary in the level of accuracy with which they've been delineated, and flood hazards change over time. Consequently all development and infrastructure on floodplains and other areas where water may accumulate within the Village of Fleischmann's are potentially vulnerable to the flood hazard, regardless of inclusion in the FIS/FIRM.

In general, an "approximate" study determines the horizontal extent of the flood hazard only, based on the best available data. Flood hazard areas studied by approximate methods are shown as "A" zones on the Delaware County FIRM. A "detailed" study is more accurate than an approximate study and provides additional information about the flood hazard, such as water surface elevation during a flood of a given magnitude. Flood hazard areas studied by detailed methods are shown as "AE" zones on the Delaware County FIRM<sup>4</sup>.

No stream reaches within the Village were studied by detailed methods. Emory Brook, Vly Creek, Little Red Kill, and the Bushkill within the Village of Fleischmann's were studied using approximate methods.

### Floodplain population and the National Flood Insurance Program

The Village of Fleischmann's has a total of 330 parcels and of those parcels, 128 (38.8%) intersect the FEMA-defined 1% annual chance (100-year) flood boundary<sup>5</sup>. It is estimated that in the Village of Fleischmann's, 82 residents live within the 1% annual chance (100-year) floodplain<sup>6</sup>.

As of January 2012 FEMA reports 18 flood insurance policies under the **National Flood Insurance Program (NFIP)** in the Village of Fleischmann's. There were 3 **Repetitive Loss**<sup>7</sup> properties in the Village of Fleischmann's at that time<sup>8</sup>.

### HAZUS results

HAZUS-MH estimates that for a 1% annual chance event, 75 people may be displaced and 19 people may seek short-term sheltering, representing 24.4% and 62% of the Village's population, respectively. For the .02% annual chance event, it is estimated that 84 people may be displaced and 29 people may seek short-term sheltering, representing 27.3% and 9.4% percent of the Village's population, respectively<sup>9</sup>.

As summarized in Table 9.21-1 below, there is \$19,796,400 of total assessed property (structure and land) exposed to the 1% annual chance flood in the Village of Fleischmann's. For the .02% annual chance flood, it is estimated that there is \$19,796,400 of total assessed property exposed in the Village.

<sup>4</sup> For more information on FEMA Flood Insurance Studies and Flood Insurance Rate Maps, please see Section 5.4.3

<sup>5</sup> Delaware County DFIRM (FEMA, 2012); Village of Fleischmann's Tax Parcels (Delaware County Real Property, 2011)

<sup>6</sup> Please see Section 5.4.3 for a full description of the methods used to determine exposure to the flood hazard

<sup>7</sup> Repetitive Loss properties have received two flood insurance payouts of over \$1000 within a ten-year period

<sup>8</sup> FEMA, 2012

<sup>9</sup> HAZUS-MH 2.0

Table 9.21-1. Estimated Assessed Value (Building and Land) Located in the 1% annual chance (100-year) and .02% annual chance (500-year) floodplains

1% annual chance (100-year)			.02% annual chance (500-year)		
Land AV	Building AV	Total AV	Land AV	Building AV	Total AV
\$2,266,400	\$17,530,000	\$19,796,400	\$2,266,400	\$17,530,000	\$19,796,400

Source: Real Property Data (July 2011) provided by Delaware County

Note: AV = Assessed Value

HAZUS-MH calculates the estimated potential damage to the general building stock inventory associated with the 1% annual chance and .02% annual chance flood events. HAZUS-MH estimates approximately \$4.5 million and approximately \$5.2 million of potential general building stock loss as a result of the 1% annual chance and .02% annual chance flood events. Table 9.21-2 summarizes the potential loss estimates by occupancy class.

Table 9.21-2. Estimated Potential General Building Stock Loss (Structure and Contents) by the 1% annual chance (100-year) and .02% annual chance (500-year) Flood Events

Total Buildings (All Occupancies)		Percentage of Total Building Value		Residential Buildings		Commercial Buildings		Industrial Buildings	
1% annual chance (100-year)	.02% annual chance (500-year)	1% annual chance (100-year)	.02% annual chance (500-year)	1% annual chance (100-year)	.02% annual chance (500-year)	1% annual chance (100-year)	.02% annual chance (500-year)	1% annual chance (100-year)	.02% annual chance (500-year)
\$4,507,000	\$5,244,000	6.7	7.8	\$2,118,000	\$2,728,000	\$1,998,000	\$2,096,000	\$0	\$0

Agriculture Buildings		Religious Buildings		Government Buildings		Education Buildings	
1% annual chance (100-year)	.02% annual chance (500-year)	1% annual chance (100-year)	.02% annual chance (500-year)	1% annual chance (100-year)	.02% annual chance (500-year)	1% annual chance (100-year)	.02% annual chance (500-year)
\$30,000	\$33,000	\$361,000	\$386,000	\$0	\$1,000	\$0	\$0

Source: HAZUS-MH 2.0

There are two critical facilities and two utilities located within the 1% annual chance and .02% annual chance flood boundaries. Table 9.21-3 and 9.21-4 summarizes the potential loss estimates to the Village's inventory as calculated by HAZUS-MH.

Table 9.21-3. Critical Facilities Located in the Preliminary DFIRM Flood Boundaries and Estimated Potential Damage from the 1% annual chance and .02% annual chance flood events

Name	Type	Exposure		Potential Loss			
		1% Annual	.02% Annual	1% Annual Structure Damage %	1% Annual Content Damage %	.02% Annual Structure Damage %	.02% Annual Content Damage %
Fleischmann's VFD	Fire	x	x	12.3	56.4	16.5	78.0
School Building	School			5.6	30.2	8.6	50.1

Source: FEMA, 2011; HAZUS-MH 2.0

Notes:

- (1) 'X' indicates the facility location as provided by Delaware County is located in the preliminary DFIRM flood zone.
- (2) HAZUS did not calculate potential loss estimates for some facilities located in the preliminary DFIRM flood zone. This is because these facilities are located outside of the flood depth grid generated by HAZUS. The difference between the flood depth grid generated by HAZUS and the preliminary DFIRM flood zones is most likely due to the

resolution of the elevation model used (1/3 Arc Second or 10 meters) which differed from the elevation data used to generate the DFIRM itself.

- (3) In some cases, HAZUS calculated potential flood loss to structures outside the preliminary FEMA DFIRM. These facilities are located inside the HAZUS flood depth grid.
- (4) Loss estimate calculations for electric facilities are not supported in HAZUS-MH 2.0.

Table 9.21-4 Utilities Located in the Preliminary DFIRM Flood Boundaries and Estimated Potential Damage from the 1% annual chance and .02% annual chance flood events

Name	Type	Exposure		Potential Loss	
		1% Annual	.02% Annual	1% Annual Damage %	.02% Annual Damage %
Park Wells	Potable Water Well	x	x	35.7	3.4
Religious School and Children's Camp	WWTF			9.2	9.2

Source: FEMA, 2011; HAZUS-MH 2.0

Notes:

- (1) 'X' indicates the facility location as provided by Delaware County is located in the preliminary DFIRM flood zone.
- (2) Loss estimate calculations for electric and communication facilities are not supported in HAZUS-MH 2.0.
- (3) HAZUS did not calculate potential loss estimates for some facilities located in the preliminary DFIRM flood zone. This is because these facilities are located outside of the flood depth grid generated by HAZUS. The difference between the flood depth grid generated by HAZUS and the preliminary DFIRM flood zones is most likely due to the resolution of the elevation model used (1/3 Arc Second or 10 meters) which differed from the elevation data used to generate the DFIRM itself.
- (4) In some cases, HAZUS calculated potential flood loss to structures outside the preliminary FEMA DFIRM. These facilities are located inside the HAZUS flood depth grid.

### Severe Storm

The entire Village is exposed and thus vulnerable to a severe storm event. HAZUS-MH estimates the 100-year **mean return period (MRP)** wind speeds for Delaware County to be 35 to 60 miles per hour (mph). This equates to a Tropical Depression to a Tropical Storm. For the 100-year MRP event, HAZUS-MH 2.0 estimates \$2,531 in building damages to the general building stock (structure) or less than one-percent of the Village of Fleischmann's building inventory. For the 500-year MRP wind event, HAZUS-MH estimates wind speeds to range from 63 to 77 mph across the County. This equates to a Tropical Storm to a Category One hurricane. HAZUS-MH estimates \$6,682 in damages to the general building stock (structure) or less than one-percent of the Village's building inventory. The residential buildings are estimated to experience the majority of the damage (wood and masonry).

HAZUS-MH estimates the probability that critical facilities (i.e., medical facilities, fire/EMS, police, EOC, schools, and user-defined facilities such as shelters and municipal buildings) may sustain damage as a result of 100-year and 500-year MRP wind-only events. Additionally, HAZUS-MH estimates the loss of use for each facility in number of days. At this time, HAZUS-MH does not estimate losses to transportation lifelines and utilities as part of the hurricane model.

HAZUS-MH does not estimate any damage or loss of use for critical facilities as a result of a 100-year MRP event. Table 9.21-5 lists the estimated loss of use in days for each critical facility and the probability of sustaining the damage category as defined by the column heading, for the 500-year wind-only events.

Table 9.21-5. Estimated Impacts to Critical Facilities by the 500-Year MRP Hurricane Event (Wind Only)

500-Year Event						
Name	Type	(Days)	Percent Probability of Sustaining Damage			
		Loss Of Use	Minor	Moderate	Severe	Complete
Fleischmanns VFD	Fire	0	0	0	0	0
School Building	Schools	0	0	0	0	0
Village Hall and Library	Municipal	0	0	0	0	0
DPW Garage	Municipal	0	0	0	0	0

Source: HAZUS-MH 2.0

### *Severe Winter Storm*

Table 9.21-6 summarizes percent damages that could result from severe winter storm conditions for the Village's total building stock (structure only). Given professional knowledge and information available, the potential losses for this hazard are considered to be overestimated; hence, conservative estimates for losses associated with severe winter storm events.

Table 9.21-6. General Building Stock (Structure Only) Exposure and Estimated Losses from Severe Winter Storm Events

Total (All Occupancies) RV	1% Damage Loss Estimate	5% Damage Loss Estimate	10% Damage Loss Estimate
\$40,650,000	\$406,500	\$2,032,500	\$4,065,000

Source: HAZUS-MH 2.0

RV = Replacement Cost Value.

## Wildfire

**Wildland Urban Interface (WUI)** areas are located throughout the County. See Figure 5.4.5-2 in Section 5.4.5 (Wildfire) for an illustration of the WUI in Delaware County. The Village of Fleischmann's is located completely within the WUI. It is estimated that 308 people<sup>10</sup> in the Village are exposed to the WUI, or 100% of the Village's total population<sup>11</sup>.

Buildings constructed from wood or vinyl siding are generally more likely to be impacted by the wildfire hazard than buildings constructed of brick or concrete. According to HAZUS-MH's default general building stock database, approximately 67% of the buildings in the County are constructed of wood.

In the Village of Fleischmann's, 100% of the Village's total building stock is exposed and thus vulnerable to the wildfire hazard (replacement value \$67,135,000)<sup>12</sup>.

It is recognized that a number of critical facilities, transportation and utility assets are located in the wildfire hazard area, and are also vulnerable to the threat of wildfire. Many of these facilities are the locations for vulnerable populations (i.e., schools) and responding agencies to wildfire events (i.e., fire, police). Table 9.21-5 summarizes critical facilities identified by the Planning Committee that are critical to the Village and are vulnerable to the wildfire hazard.

Table 9.21-5. Facilities in WUI

Type	Name
Municipal	Village Hall and Library
Fire	Fleischmann's VFD
School	School Building
Municipal	DPW Garage

Source: GeoMAC, 2012

## Growth/Development Trends

No known or anticipated new development has been identified in the Village of Fleischmann's at this time.

<sup>10</sup> U.S. Census, 2000

<sup>11</sup> HAZUS-MH 2.0; GeoMAC, 2012

<sup>12</sup> Ibid

## C.) NATURAL HAZARD EVENT HISTORY SPECIFIC TO THE VILLAGE

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Local Damages and Losses
April 20, 2002	Earthquake 5.1	DR-1415	No	Largest earthquake to hit New York State in 20 years. A state of emergency was declared in Essex and Clinton Counties. In Delaware County, the Towns of Delhi, Deposit, Hamden, Middletown, and Walton and the Village of Fleischmann's all reported having felt the earthquake.
April 2-4, 2005	Severe Storms and Flooding	DR-1589 (IA and PA)	Yes	Infrastructure Damage: Emory Brook, Lake Street, and Ellsworth Avenue
February 23-26, 2010	Winter Storm	N/A	N/A	\$30,000 estimated cleanup costs
August 25 – September 5, 2011	Hurricane Irene	EM-3328 / DR-4020 (PA and IA)	Yes	Major flooding was reported in the Villages of Margaretville and Fleischmann's, where over 200 people were evacuated. In the Village of Fleischmann's, homes were washed off their foundations. One fatality was reported from the flood-damaged Valkyrian Motel. Total damage amounts TBD.
September 7 -10, 2011	Remnants of Tropical Storm Lee	EM-3341 / DR-4031 (PA and IA)	Yes	Total damage amounts TBD.

**D.) NATURAL HAZARD RISK/VULNERABILITY RISK RANKING**

Rank #	Hazard Type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard <sup>a,c</sup>	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking <sup>b</sup>
1	Flood	1% Annual Chance (100-yr): \$13,070,000 .02% Annual Chance (500-yr): \$15,156,000	Frequent	54	High <sup>c,e</sup>
2	Wildfire	Not available	Frequent	45	High <sup>c,d</sup>
3	Severe Storm	100-Year MRP: \$3,331 500-Year MRP: \$9,834 Annualized Loss: \$558	Frequent	39	High <sup>c,d</sup>
3	Severe Winter Storm	1%: \$536,240 5%: \$2,681,200	Frequent	39	High <sup>d</sup>
4	Drought	Not available	Frequent	21	Medium <sup>c,e</sup>
5	Earthquake	500-Year MRP: \$155,235 2,500-Year MRP: \$2,051,848 Annualized Loss: \$1,952	Occasional	20	Low <sup>e,f</sup>
6	Extreme Temp	Not available	Frequent	18	Low
6	Infestation	Not available	Frequent	18	Low
6	Landslide	Not available	Occasional	18	Low

- a. Building damage ratio estimates based on FEMA 386-2 (August 2001)
- b. High = Total hazard priority risk ranking score of 39 and above  
Medium = Total hazard priority risk ranking of 21-38  
Low = Total hazard risk ranking 20 or below
- c. The valuation of general building stock and loss estimates was based on the default general building stock database provided in HAZUS-MH 2.0 (RSMeans 2006).
- d. Loss estimates are structural values only; does not include the value of contents.
- e. Loss estimates represent both structure and contents.
- f. "The HAZUS-MH earthquake model results are reported by Census Tract. In some cases, there is more than one municipality per Census Tract. Therefore, these results include the Town of Middletown and Villages of Fleischmann's and Margaretville."

Notes: MRP = Mean Return Period; WUI - Wildland Urban Interface.

**E.) CAPABILITY ASSESSMENT**

This section identifies the following capabilities of the local jurisdiction:

- Legal and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification.

**E.1) Legal and Regulatory Capability**

Regulatory Tools (Codes, Ordinances, Plans)	Do you have this? (Y or N)	Code Citation (Section, Paragraph, Page Number, Date of adoption)
Building Code	Y	New York State
Zoning Ordinance	Y	2011
Subdivision Ordinance	N	
NFIP Flood Damage Prevention Ordinance	Y	1987. Adoption of 2012 Flood Damage Prevention Ordinance/DFIRM in progress
Cumulative Substantial Damages	N	
Freeboard	Y	2' above BFE as per NYS Building Code
Stormwater Management Plan/Ordinance	Y	Additional regulations as per 1997 NYC Watershed Rules and Regulations
Comprehensive Plan / Master Plan/ General Plan	Y	November 2009
Capital Improvements Plan	N	
Site Plan Review Requirements	Y	2011 (Zoning)
Open Space Plan	N	
Stream Corridor Management Plan	Y	East Branch Delaware River SCMP – Dec. 2007
Economic Development Plan	N	
Comprehensive Emergency Management Plan	Y	County-wide – 2004
Emergency Response Plan	Y	Local ERP in process, to cover Middletown, Margaretville, Fleischmanns, Hardenburgh, Halcott
Post Disaster Recovery Plan	Y	In progress - Awarded NYSDOS Long-Term Community Recovery Strategy Grant, Feb. 2012
Source Water Protection Plan	Y	2005
Post Disaster Recovery Ordinance	N	
Real Estate Disclosure Requirement	Y	New York State Land Use Laws
Other [Special Purpose Ordinances (i.e., critical or sensitive areas)]	N	

**E.2) Administrative and Technical Capability**

Staff/ Personnel Resources	Available (Y or N)	Department/ Agency/ Position
Planner(s) or Engineer(s) with knowledge of land development and land management practices	Y	Delaware County Planning Department Town Planning Advisory Service, Delaware County Stream Corridor Management Program
Engineer(s) or Professional(s) trained in construction practices related to buildings and/or infrastructure	Y	Delaware County Department of Public Works; Delaware County Soil and Water Conservation District; Delaware County Planning Department Town Planning Advisory Service; also Contracted
Planners or engineers with an understanding of natural hazards	Y	Delaware County Planning Department Town Planning Advisory Service, Delaware County Stream Corridor Management Program
NFIP Floodplain Administrator	Y	Code Enforcement Officer/Building Inspector
Surveyor(s)	N	
Personnel skilled or trained in "GIS" applications	Y	Delaware County Planning Department Town Planning Advisory Service
Scientist familiar with natural hazards	Y	Delaware County Soil & Water Conservation District
Emergency Manager	Y	Delaware County Department of Emergency Services
Grant Writer(s)	Y	MARK Project / Delaware County Planning Department Town Planning Advisory Service
Staff with expertise or training in benefit/cost analysis	N	

**E.3) Fiscal Capability**

The table below identifies common funding mechanisms the Village could consider for the implementation of mitigation initiatives. For each funding mechanism, the table shows if it has been used by the Village to fund projects in the past; what projects it was used for (if applicable); and possible limitations on its use for future projects.

A full description of fiscal tools and funding mechanisms is provided in Volume I, Section 6 - Mitigation Strategy, of this plan. It is assumed that the Hazard Mitigation Grant Program and the Pre-Disaster Mitigation Grant program will be pursued, so they are not listed here.

Financial Resources	Used for past projects? Which ones?	Limitations on future use?
Community Development Block Grants (CDBG)	Yes (Through MARK Project)	None
Capital Improvements Project Funding	Yes (Water Grant, WWTP)	None
Authority to Levy Taxes for specific purposes	Yes	Potentially contentious/public opposition
User fees for water, sewer, gas or electric	Yes	None

Financial Resources	Used for past projects? Which ones?	Limitations on future use?
service		
Impact Fees for homebuyers or developers of new development/homes	No	?
Incur debt through general obligation bonds	Yes	?
Incur debt through special tax bonds	Yes	?
Incur debt through private activity bonds	No	?
Withhold public expenditures in hazard-prone areas	No	Unlikely the Village would choose to do this
Federal (FEMA, ACOE, NRCS, etc.)	Yes- Ongoing EWP projects (NRCS)	none
State mitigation grant programs (e.g. NYSOEM, NYSDEC, NYSDOS)	Yes- Ongoing LTRC (NYSDOS)	none
Catskill Watershed Corporation grant programs	Yes	none
Delaware County Stream Corridor Management Program	Yes- Ongoing Village-wide SCMP	none
Other		

#### E.4) Community Classifications

Program	Classification	Date Classified
Community Rating System (CRS)	NP	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	4 (Residential); 3 (Commercial/Industrial)	1/1/2010
Public Protection	TBD	TBD
Storm Ready	County	TBD
Firewise	NP	N/A

N/A = Not applicable. NP = Not participating. - = Unavailable. TBD = To Be Determined

The classifications listed above relate to the community's effectiveness in providing services that may impact its vulnerability to the natural hazards identified. These classifications can be viewed as a gauge of the community's capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual:  
<http://www.fema.gov/library/viewRecord.do?id=2434>
- The Building Code Effectiveness Grading Schedule:  
<http://www.isomitigation.com/bcegs/0000/bcegs0001.html>
- The ISO Mitigation online ISO's Public Protection website:  
<http://www.isomitigation.com/ppc/0000/ppc0001.html>

- The National Weather Service Storm Ready website:  
<http://www.weather.gov/stormready/howto.htm>
- The National Firewise Communities website:  
<http://firewise.org/>

### **F.1) COMPLETED MITIGATION ACTIVITY/EFFORTS**

According to the Village of Fleischmann's, the following have been identified as mitigation projects/activities that have been completed:

#### **Education and Awareness:**

- Village Staff:
  - Code Enforcement Officer/Floodplain Administrator
    - Passed Certified Floodplain Manager exam 4/2010
    - Completed FEMA E-278, "The Community Rating System" 9/2010
    - Senior member, Delaware County Floodplain Management Advisory Committee
- Public
  - Village-wide mailing to owners of property within the 1% annual chance (100-year) floodplain according to 8/2009 Preliminary DFIRM. Address list was generated based on parcel boundaries, not building footprints. Mailing advised property owners of the flood hazard and the availability of flood insurance.
  - As part of this planning process and to meet the requirements of HMGP 1957-1993-4020-4031, Town of Middletown held a public meeting to inform property owners about mitigation options. This meeting was advertised in the local newspapers and radio, and direct mailings were sent to:
    - Owners of properties substantially damaged during Hurricane Irene/Tropical Storm Lee;
    - Owners of Repetitive Loss and Severe Repetitive Loss properties in the Town of Middletown and the Villages of Margaretville and Fleischmann's;
    - All those who had expressed interest in mitigation to Town or Village officials and/or the Delaware County Planning Department.

#### **Property Protection:**

- Ellsworth Avenue retaining wall rebuilt, drainage fixed.
- Schnieder Avenue box culvert rebuilt with catch basin grading, etc.
- Streambank stabilization/Lake Street road surface paving to prevent erosion.

#### **Natural Resource Protection:**

- Adopted East Branch Delaware River Stream Corridor Management Plan (2009)
  - The Village has adopted the East Branch Delaware River Stream Corridor Management Plan and appointed representatives to the Stream Corridor Management Program's Project Advisory Committee (PAC). The Village FPA serves on the PAC's Floodplain Management Advisory Committee.
- Stormwater project (Delaware Engineering)

## F.2) HAZARD VULNERABILITIES IDENTIFIED

According to the Village of Fleischmann's, the following hazards and problem areas have been identified within the community:

### Critical Facilities:

- **DPW garage and Fire House located in floodplain.**  
Both sustained damage from Hurricane Irene, and were unusable during the response. The structures were damaged during flood events in 1986, 1996, 2006, 2008 and 2011. More importantly, the loss of service of these facilities during flood events has a debilitating effect on the Village and its residents as it pertains to safety and emergency response.
- **Water supply wells in floodplain**
- **Sewage pump station in floodplain.**  
Electrical system was damaged during Hurricane Irene.

### Undersized stream crossings:

- Bush Kill/Main Street bridge (damaged by flooding from Hurricane Irene)
- Bush Kill/Depot Street bridge (damaged by flooding from Hurricane Irene)
- Bush Kill/Bridge Street bridge (destroyed by flooding from Hurricane Irene)
- Mill Street Bridge (damage/undermining of bank armoring)
- Little Redkill/Main Street crossing
  - Proximity of adjacent structures limits the area available to use for an upgrade to the crossing.

### Stream issues:

- Stream bank retaining walls failed on Mill Street, in Ballpark, and several other locations. Widespread stream bank instability from Mill Street to Village Line.
- Large sediment supply upstream from Lake Switzerland impoundment

### Stormwater/Drainage:

- Excessive drainage off of private driveway into road regularly causes icing on the road (Breezy Hill off of Old Halcott road).

### F.3) PROPOSED HAZARD MITIGATION INITIATIVES

Note some of the identified mitigation initiatives in Table F are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities.

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority
<b>Structure/Infrastructure protection</b>										
1	15 Sites Village-wide approved through Emergency Watershed Protection program	Existing	Flood	1-1 1-6 1-9 3-1 4-4	SCMPPr	High	2,038,169	EWP, NYCDEP	Ongoing	High
2	Relocate DPW and Firehouse out of the flood plain	Existing	Flood	1-1 1-2 3-1 3-2 4-1 4-2 4-4	Village of Fleischmanns with support from East Branch Flood Commission, DCPD	High	1,500,000	Municipal budget, FEMA HMA	DOF	High
3	Acquire land for flood protection within the village (for relocating structures and reclaiming floodplains)	New	Flood		Village of Fleischmanns with support from East Branch Flood Commission, DCPD, SCMPPr	High	High	Municipal Budget, NYCDEP, FEMA HMA	DOF	

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority
4	<b>Support Delaware County's application to Hazard Mitigation Grants Program for structure elevations/acquisitions (DR- 1957-1993-4020-4031)</b> <ul style="list-style-type: none"> <li>Provide support to eligible property owners within the Town seeking to elevate or sell their structure for demolition/conversion to open space through the Delaware County-administered 2012 HMGP (DR-4020).</li> <li>Further, provide support to property owners who wish to stay within the municipality, including but not limited to helping them to find appropriate housing outside of the flood hazard area.</li> </ul>									
		Existing	Flood	1-1 1-2 1-7 2-1 2-2 3-2	DCPD, DCDPW with support from Village of Fleischmann's, East Branch Flood Commission	High	High	HMGP, Delaware County, NYCDEP	Ongoing	High
5	<b>Retrofit structures located in hazard-prone areas to protect structures from future damage:</b> <ul style="list-style-type: none"> <li>Repetitive loss and severe repetitive loss properties as priority.</li> <li>Phase 1: Identify appropriate candidates for retrofitting based on cost-effectiveness versus relocation.</li> <li>Phase 2: Where retrofitting is determined to be a viable option, work with property owners toward implementation of that action based on available funding from FEMA and local match availability.</li> </ul>									
		Existing	Flood	1-1 1-2 1-3 1-5 1-6 1-9 2-1 2-2 3-1 3-2 4-1	Village of Fleischmann's with support from East Branch Flood Commission, DCPD, DCDPW, NYSDEC, NYSOEM, FEMA	High	High	FEMA Mitigation Grant Programs, NYCDEP, CDBG, ICC	Long-term DOF	

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority
6	<b>Acquire and demolish or relocate structures located in hazard-prone areas to protect structures from future damage:</b>									
	<ul style="list-style-type: none"> <li>• Repetitive loss and severe repetitive loss properties as priority.</li> <li>• Phase 1: Identify appropriate candidates for relocation based on cost-effectiveness versus retrofitting.</li> <li>• Phase 2: Where relocation is determined to be a viable option, work with property owners toward implementation of that action based on available funding from FEMA and local match availability.</li> <li>• Phase 3: Where relocation will not be cost-beneficial but acquisition/demolition is a possibility, work with property owners toward implementation of that action based on available funding from FEMA and local match availability. Work with the owners of acquired properties to find appropriate housing within the community, if they desire.</li> </ul>									
		Existing	Flood, Severe Storm, Earthquake	1-1 1-2 1-5 1-6 1-9 2-1 2-2 3-1 3-2 4-1	Village of Fleischmann's with support from East Branch Flood Commission, DCPD, DCDPW, NYSDEC, NYSOEM, FEMA	High	High	FEMA Mitigation Grant Programs, NYCDEP, CDBG, ICC	Long-term DOF	

**Prevention and planning**

7	<b>Flood Risk Mapping and Analysis on East Branch Delaware River and tributaries through the RiskMAP program</b>									
	<ul style="list-style-type: none"> <li>• This ongoing initiative is a collaborative effort between NYCDEP, NYSDEC, FEMA and NYC West-of Hudson Watershed municipalities. It will produce updated Flood Insurance Studies/Flood Insurance Rate Maps for stream reaches on the Bush Kill, Emory Brook, and Vly Creek.</li> </ul>									
		New & Existing	Flood, Severe Storm	1-1 1-3 1-6 1-9 2-2 2-3 3-1	NYCDEP, NYSDEC, FEMA with support from W. of Hudson Flood Mapping Steering Committee	Medium	Medium	NYCDEP	Ongoing	Medium

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	
8	<b>Develop a Long-Term Community Recovery Strategy</b> The Village has been awarded a \$50,000 grant from NYS Department of State to develop a Long-Term Community Recovery Strategy. The award was announced in February 2012.										
		New & Existing	Flood, Severe Storm	1-1 1-2 1-3 1-6 1-8 1-9 2-3 3-1 3-2 4-1	V. of Fleischmann's with support from East Branch Flood Commission, NYSDOS, SCMP, DCPD, NYSDEC, NYSOEM, FEMA	Medium	Medium	NYSDOS LTCR Grant (Awarded 2/2012)	Ongoing	High	
9	<b>Participate in East Branch Flood Commission</b> <ul style="list-style-type: none"> <li>The Village has appointed representatives to the East Branch Flood Commission (EBFC), an inter-municipal effort to address flood damage threats at a watershed scale. The EBFC formed in response to the August 2011 flooding along the East Branch of the Delaware River and its tributaries, and includes the towns of Middletown, Roxbury, Halcott and Hardenburgh, and the Villages of Margaretville and Fleischmann's. The EBFC is supported by the Delaware County Departments of Emergency Services, Public Works, Planning, Watershed Affairs, and Economic Development; The DelCo Soil and Water Conservation District; NYC Department of Environmental Protection; and the NYS Department of Environmental Conservation.</li> </ul>										
		NA	Flood	1-1 1-2 1-3 1-6 1-8 2-1 3-1 3-2	See above	Medium	Low	Municipal budget	Ongoing	High	

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	
10	<b>Develop a Village-wide Stream Corridor Management Plan</b>										
	<ul style="list-style-type: none"> <li>• The Village has received funding through the Delaware County Stream Corridor Management Program to develop a stream corridor management plan (SCMP). This SCMP will include: <ul style="list-style-type: none"> <li>○ Inventory of all watercourses within and immediately adjacent to the Village (hydraulic analysis/report to determine stream condition, appropriate channel design for each watercourse and information on sediment supply and transport).</li> <li>○ Floodplain analysis within and outside of the Village to determine what improvements can be made to maintain healthy stream channels and minimize flood damages to the Village during high water events. <ul style="list-style-type: none"> <li>▪ This will include flood inundation mapping and modeling to examine restrictions within the floodplain, both natural and manmade to help develop appropriate land uses along stream corridors.</li> </ul> </li> <li>○ The SCMP will specifically address the following:</li> </ul> </li> </ul>										
		Existing	Flood	1-1 1-3 1-6 1-9 2-2 2-3 3-1	Village of Fleischmann's with support from East Branch Flood Commission, SCMP	Medium	\$72,500	SCMP Stream Management Implementation Grant (Awarded 12/2011)	Ongoing	High	
10.1	Increase capacity of Bush Kill/Main Street Bridge	Existing	Flood	1-1 1-3 1-6 1-9 2-2 2-3 3-1	Village of Fleischmann's with support from East Branch Flood Commission, SCMP, DCDPW	TBD	TBD	TBD	DOF	Low	
10.2		Existing	Flood	1-1 1-3 1-6 1-9 2-2 2-3 3-1	Village of Fleischmann's with support from East Branch Flood Commission, SCMP	TBD	TBD	TBD	DOF	Low	
10.3	Reinforce stream banks behind Main Street on Mill Street and Wagner Avenue	Existing	Flood	1-1 1-3 1-6 1-9 2-2	Village of Fleischmann's with support from East Branch Flood	TBD	High	SCMP	DOF	Low	

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority
				2-3 3-1	Commission, SCMPr					

### National Flood Insurance Program Compliance

	<b>Maintain compliance with and good-standing in the NFIP including:</b> <ul style="list-style-type: none"> <li>• Adoption and enforcement of floodplain management requirements <ul style="list-style-type: none"> <li>◦ regulating all new and substantially improved construction in Special Hazard Flood Areas</li> </ul> </li> <li>• Floodplain identification and mapping,</li> <li>• Flood insurance outreach to the community.</li> <li>• Further, continue to meet and/or exceed the minimum NFIP standards and criteria through the following NFIP-related continued compliance actions identified as Initiatives 12 – 14. (below).</li> </ul>									
11		New & Existing	Flood, Severe Storms	1-1 1-2 1-4 1-5 1-6 1-7 2-1 2-2 3-2 4-2	Village of Fleischmanns with support from East Branch Flood Commission, SCMPr, NYSDEC, NYSOEM, FEMA	High	Low - Medium	Local Budget	Ongoing	High
12	Have designated NFIP Floodplain Administrator (FPA) maintain Certified Floodplain Manager status through the ASFPM, and pursue relevant continuing education training such as FEMA Benefit-Cost Analysis.	N/A	Flood, Severe Storms	1-1 1-4 1-5 1-9 2-1 2-3 4-1 4-2	NFIP Floodplain Administrator with support from from DelCo Streams Program, Walton Flood Commission, NYSDEC	Medium	Low	Municipal Budget	Short (DOF)	High
13	Archive elevation certificates	NA	Flood, Severe Storm	1-1 1-4 1-5 2-2 4-1	NFIP Floodplain Administrator	Low	Low	Local Budget	On-going	High

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority
14	<b>Participate in the Community Rating System (CRS) to further manage flood risk and reduce flood insurance premiums for NFIP policyholders:</b> 1. Submission to FEMA-DHS of a Letter of Intent to join CRS 2. Community's current compliance with the NFIP is established. 3. Completion and submission of an application to the program									
		NA	Flood, Severe Storms	1-1 1-2 1-4 1-5 1-6 1-7 1-8 1-9 3-2 4-1	NFIP Floodplain Administrator with support from NYSDEC, NYSOEM, FEMA	Low	Low	Municipal Budget	Short (year 1)	Medium

**Education and Outreach**

15	<b>Training for municipal officials, staff and first responders:</b> <ul style="list-style-type: none"> <li>• Work with existing federal, state and county programs to bring appropriate training to municipalities and first responders, including but not limited to:                             <ul style="list-style-type: none"> <li>○ NFIP floodplain development requirements and compliance</li> <li>○ Disaster response:                                     <ul style="list-style-type: none"> <li>▪ Implementation of local emergency response procedures</li> <li>▪ DelCo Comprehensive Emergency Management Plan/National Incident Management System</li> </ul> </li> <li>○ Post-Disaster Code Enforcement and damage assessments</li> <li>○ Stream and floodplain function as it relates to flood damage prevention</li> <li>○ Mitigation project development and administration</li> <li>○ Public Assistance claims administration</li> <li>○ New York Alert</li> </ul> </li> </ul>									
		Existing	Flood, Severe Storm	1-4 1-9 2-1 2-2 2-3 3-1 4-1 4-2	East Branch Flood Commission with support from DCDES, SCMP, DCPD, NYSDEC, NYSOEM, FEMA	High	Low		Short	High



Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	
16	<b>Public education and outreach:</b>										
	<ul style="list-style-type: none"> <li>• Work with existing federal, state and county programs to bring appropriate public outreach to Town residents, especially those most vulnerable to natural disasters. Topics will include but not be limited to:                             <ul style="list-style-type: none"> <li>○ Disaster preparedness</li> <li>○ Hazard mitigation</li> <li>○ Stream management for riparian landowners</li> </ul> </li> </ul>										
		NA	All Hazards	1-2 1-7 1-9 2-1 2-2 2-3 3-1 3-2 4-4	East Branch Flood Commission with support from DCDES, SCMP, DCPD, NYSDEC, NYSOEM, FEMA	Medium	Low		Short	High	
17	Develop community webpage to include information related to local Emergency Management	NA	All Hazards	1-1 1-2 2-1 2-2 2-3 3-2	East Branch Flood Commission with support from DCDES, SCMP, DCPD	Medium	Low	Municipal budget	Short	High	

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority
18	<p><b>Participate in local, county and/or state level projects and programs to develop improved structure and facility inventories and hazard datasets to support enhanced risk assessment efforts.</b></p> <ul style="list-style-type: none"> <li>Such programs may include developing a detailed inventory of critical facilities based upon FEMA's Comprehensive Data Management System (CDMS) which could be used for various planning and emergency management purposes including:                             <ul style="list-style-type: none"> <li>Support the performance of enhanced risk and vulnerability assessments for hazards of concern.</li> <li>Support state, county and local planning efforts including mitigation (including updates to the State HMP), comprehensive emergency management, debris management, and land use.</li> </ul> </li> </ul> <p>Improved structural and facility inventories could incorporate flood, wind and seismic-specific parameters (e.g. first floor elevations, roof types, structure types based on FEMA-154 "Rapid Visual Screening of Buildings for Potential Seismic Hazards" methodologies). It is recognized that these programs will need to be initiated and supported at the County and/or State level, and will require training, tools and funding provided at the county, state and/or federal level.</p>									
		Existing	All Hazards	1	DCPD GIS, DCDES, SCMP, FEMA, NYSOEM	Medium-High	Medium-High	Mitigation grant programs (PDM or HMGP) with local match	Longterm DOF	Medium
19	<p><b>Continue to support the implementation, monitoring, maintenance, and updating of this Plan, as defined in Section 7.0.</b></p> <ul style="list-style-type: none"> <li>Specifically, report the following information to the Delaware County Hazard Mitigation Coordinator on a regular basis:                             <ul style="list-style-type: none"> <li>Losses from disasters</li> <li>Progress on mitigation initiatives</li> <li>Changes in hazard vulnerabilities</li> </ul> </li> <li>To ensure a thorough reporting of the above, the Village will coordinate with:                             <ul style="list-style-type: none"> <li>Municipal departments</li> <li>First Responders operating in the Town</li> <li>Other organizations and agencies as appropriate</li> </ul> </li> </ul>									
		New & Existing	All Hazards	All	Village of Fleischmann's with support from Delaware County and entities involved in disaster response	High	Low – High (for 5-year update)	Local Budget, possibly FEMA Mitigation Grant Funding for 5-year update	Ongoing	High

Notes:

\*Does this mitigation initiative reduce the effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (NA) is inserted if this does not apply.

Costs:



Where actual project costs have been reasonably estimated:

Low = < \$10,000

Medium = \$10,000 to \$100,000

High = > \$100,000

Where actual project costs cannot reasonably be established at this time:

Low = Possible to fund under existing budget. Project is part of, or can be part of an existing on-going program.

Medium = Could budget for under existing work-plan, but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.

High = Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover the costs of the proposed project.

**Benefits:**

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

Low = < \$10,000

Medium = \$10,000 to \$100,000

High = > \$100,000

Where numerical project benefits cannot reasonably be established at this time:

Low = Long term benefits of the project are difficult to quantify in the short term.

Medium = Project will have a long-term impact on the reduction of risk exposure to life and property, or project will provide an immediate reduction in the risk exposure to property.

High = Project will have an immediate impact on the reduction of risk exposure to life and property.

**Potential FEMA HMA Funding Sources:**

PDM = Pre-Disaster Mitigation Grant Program

FMA = Flood Mitigation Assistance Grant Program

RFC = Repetitive Flood Claims Grant Program

SRL = Severe Repetitive Loss Grant Program

HMGP = Hazard Mitigation Grant Program

**Timeline:**

Short = 1 to 5 years. Long Term = 5 years or greater. OG = On-going program.

DOF = Depending on funding.

## G.) ANALYSIS OF MITIGATION ACTIONS

This table summarizes the participant's mitigation actions by hazard of concern and the six mitigation types to illustrate that the Village has selected a comprehensive range of actions/projects.

Hazard of Concern	Mitigation Type					
	1. Prevention	2. Property Protection	3. Public Education and Awareness	4. Natural Resource Protection	5. Emergency Services	6. Structural Projects
Drought	17, 18, 19	18, 19	16, 17, 18, 19	18, 19	18, 19	18, 19
Earthquake	17,18, 19	18, 19	16, 17, 18, 19	18, 19	18, 19	18, 19
Flooding	3, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19	1, 2, 3, 4, 5, 6, 8, 10.1,18, 19	4, 7, 8, 11, 12, 16, 17, 18, 19	1, 2, 3, 8, 10.2, 10.3, 18, 19	2, 15, 18, 19	1, 10.1, 10.2, 10.3, 18, 19
	17, 18, 19	18, 19	16, 17,18, 19	18, 19	18, 19	18, 19
	17, 18, 19	18, 19	16, 17, 18, 19	18, 19	18, 19	18, 19
Severe Storm	7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19	2, 18, 19	11, 16, 17, 18, 19	2, 18, 19	2, 18, 19	18, 19
Severe Winter Storm	17, 18, 19	18, 19	16, 17, 18, 19	18, 19	18, 19	18, 19
Wildfire	17, 18, 19	18, 19	16, 17, 18, 19	18, 19	18, 19	18, 19

Notes:

- 1. Prevention:** Government, administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.
- 2. Property Protection:** Actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- 3. Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

4. **Natural Resource Protection:** Actions that minimize hazard loss and also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
5. **Emergency Services:** Actions that protect people and property, during and immediately following, a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.
6. **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.

**H.) PRIORITIZATION OF MITIGATION INITIATIVES**

Initiative #	# of Objectives Met	Benefits	Costs	Do Benefits equal or exceed Costs? (Yes or No)	Is project Grant eligible? (Yes or No)	Can Project be funded under existing programs/budgets? (Yes or No)	Priority (High, Med., Low)
1	5	H	H	Y	Y	Y	H
2	7	H	H	Y	Y	Y	H
3	4	H	H	Y	Y	Y	H
4	6	H	H	Y	Y	Y	H
5	11	H	H	Y	Y	N	H
6	10	H	H	Y	Y	N	H
7	7	M	M	Y	Y	Y	M
8	10	M	M	Y	Y	Y	H
9	8	M	L	Y	N	Y	H
10	7	M	M	Y	Y	Y	H
10.1	7	TBD	TBD	TBD	TBD	TBD	L
10.2	7	TBD	TBD	TBD	TBD	TBD	L
10.3	7	TBD	TBD	TBD	TBD	TBD	L
11	10	H	M	Y	N	Y	H
12	8	M	L	Y	N	Y	H
13	5	L	L	Y	N	Y	H
14	10	L	L	Y	N	Y	M
15	8	H	L	Y	Y	N	H
16	9	M	L	Y	Y	N	H
17	6	M	L	Y	N	Y	H
18	18	H	H	Y	Y	N	H

Notes: H = High. L = Low. M = Medium. N = No. N/A = Not applicable. Y = Yes.

\*This initiative has a Medium priority based on the prioritization scheme used in this planning process (implementation based on grant funding), however it is recognized that addressing repetitive and severe repetitive loss properties is considered a high priority by FEMA and SOEM (as expressed in the State HMP), and thus shall be considered a High priority for all participants in the planning process.

### Explanation of Priorities

- **High Priority** - A project that meets multiple objectives (i.e., multiple hazards), benefits exceeds cost, has funding secured or is an on-going project and project meets eligibility requirements for the Hazard Mitigation Grant Program (HMGP) or Pre-Disaster Mitigation Grant Program (PDM) programs. High priority projects can be completed in the short term (1 to 5 years).
- **Medium Priority** - A project that meets goals and objectives, benefits exceeds costs, funding has not been secured but project is grant eligible under, HMGP, PDM or other grant programs. Project can be completed in the short term, once funding is completed. Medium priority projects will become high priority projects once funding is secured.
- **Low Priority** - Any project that will mitigate the risk of a hazard, benefits do not exceed the costs or are difficult to quantify, funding has not been secured and project is not eligible for HMGP or PDM grant funding, and time line for completion is considered long term (1 to 10 years). Low priority projects may be eligible other sources of grant funding from other programs. A low priority project could become a high priority project once funding is secured as long as it could be completed in the short term.

Prioritization of initiatives was based on above definitions: Yes

Prioritization of initiatives was based on parameters other than stated above: Not applicable.

#### I.) FUTURE NEEDS TO BETTER UNDERSTAND RISK/VULNERABILITY

A more detailed flood loss analysis could be conducted on a structural level (versus the Census block analysis conducted for the HMP). The location of each building, details regarding the building (see additional data needed below) and the assessed or fair market value could be included in HAZUS-MH. The FEMA DFIRM boundaries, FEMA Flood Insurance Study detailed studies, base flood elevations and available Light Detection and Ranging (LiDAR) data or digital elevation models (DEM) could be used to generate a more accurate flood depth grid and then integrated into the HAZUS model. The flood depth-damage functions could be updated using the U.S. Army Corps of Engineer damage functions for residential building stock to better correlate HAZUS-MH results with FEMA benefit-cost analysis models. HAZUS-MH would then estimate more accurate potential losses per structure.

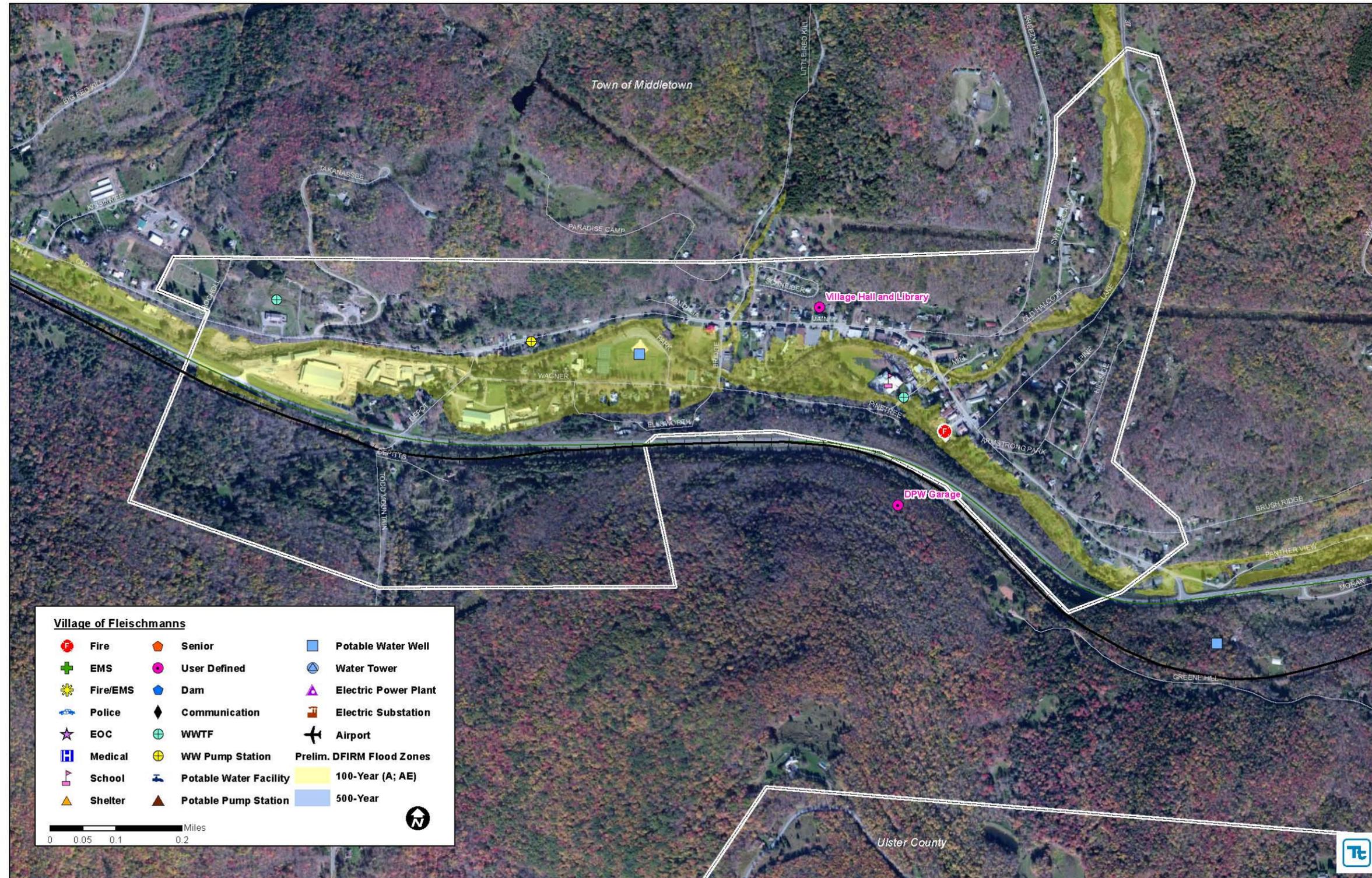
Additional data needed to perform the analysis described above:

1. Building footprint in GIS
2. Specific building information – first-floor elevation (elevation certificates), number of stories, foundation type, basement, square footage, occupancy type, year built, type of construction etc.
3. Assessed or fair market value of structure

#### J.) HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps have been generated and are provided below to illustrate the probable areas impacted within the Village of Fleischmann's. These maps are based on the best available data at the time of the preparation of this Plan, and are considered to be adequate for planning purposes. Maps have only been generated for those hazards that can be clearly identified using mapping techniques and technologies, and for which the Village has significant exposure. The County maps are provided in the hazard profiles within Section 5.4, Volume I of this Plan.

Figure 9.21-1. Village of Fleischmann's Flood Hazard Area and Critical Facilities



Sources: FEMA, 2011; Delaware County, 2011

Notes: The entire municipality is vulnerable to the following hazards: drought, earthquake, extreme temperature, infestation, severe storm, severe winter storm and wildfire. Please note preliminary DFIRMs were used to generate this figure and are not considered regulatory at this time.