

9.21 UPPER MILFORD TOWNSHIP

This section presents the jurisdictional annex for Upper Milford Township.

A. HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact		Alternate Point of Contact	
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B. MUNICIPAL PROFILE

Upper Milford Township is a mixed use community ranging from residential suburban areas adjacent to the Borough of Emmaus to rural residential areas along the easterly and southerly portions of the Township. Inter disbursed within the Township are several small village areas containing higher density population centers. The major village areas are Vera Cruz, Shimerville, Old Zionsville and Zionsville. Upper Milford Township is located directly south of Emmaus Borough and the Greater Allentown area bordered on the north by Emmaus Borough, Salisbury and Upper Saucon Township on the east by Lower Milford on the south by Montgomery and Berks County, on the west by Lower Macungie Township and Macungie Borough. The area of the Township is approximately 18.5 square miles with a population of 7,292 (2010 Census).

The South Mountain is the predominant physical feature within the Township running in a north-south direction and bisecting the Township.

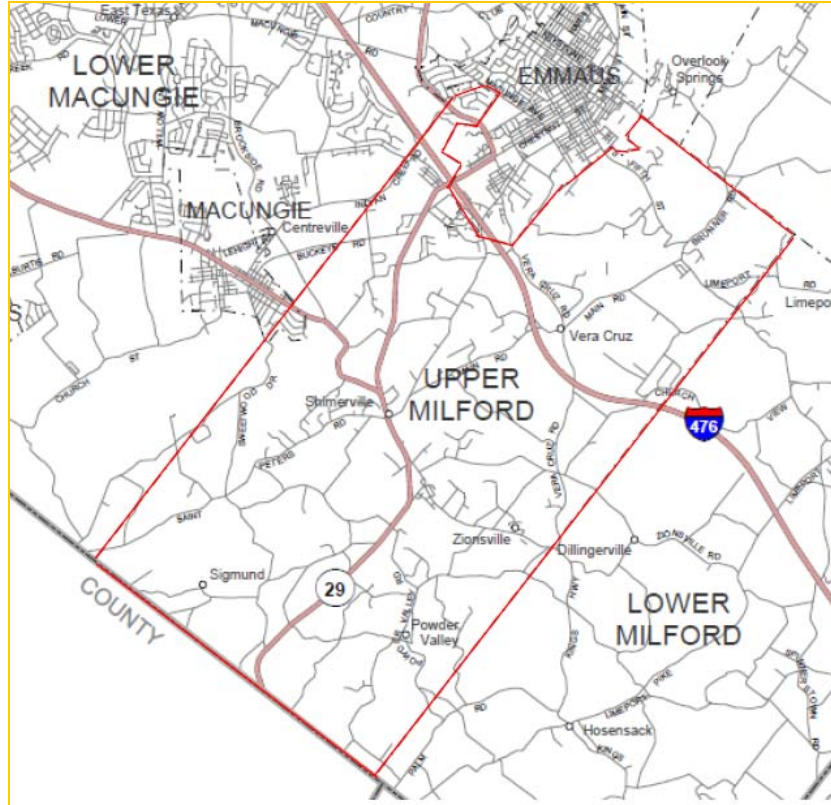
The main transportation routes passing through Upper Milford Township are PA Route 100 and Route 29. The Pennsylvania Turnpike (I-476) also passes through the Township but doesn't have any public assess points located within the Township. To a lesser degree (State Route 2023), Saint Peters Road, Shimerville Road, Main Road East and Main Road West and Brunner Road provide west to east access through the Township. The Township is also generally accessed from the Emmaus area via Pennsylvania Avenue and Vera Cruz Road and South 5th Street.

Sitting on the South Mountain the Township is located within three (3) major water sheds. The Little Lehigh Creek on the westerly and central Vera Cruz village area of the Township, the Perkiomen Creek area consisting of the southerly and easterly portions of the Township, and the Saucon Creek water shed which is a relatively small head water area located in the northeasterly portion of the Township. Due to predominately being in the headwater areas of the watersheds flooding is minimal



and significant only when rainfall intensity is over 2.5 inches in an hour. Significant areas of the Township are heavily wooded and steeply sloped making many portions of the Township susceptible to winter storm and hurricane events which result in lengthy power outages and road closures.

Figure 1



B.1 Known or Anticipated Future Development

The following table summarizes major residential/commercial development and major infrastructure development that are identified for the next five (5) to ten (10) years in the municipality. Refer to the map at the end of this annex which illustrates the hazard areas within the municipality.

New Development/Potential Development in Municipality						
Property Name	Type (Residential or Commercial)	Number of Structures	Address	Block and Lot	Known Hazard Zone*	Description/ Status
Omega Homes	Residential	114	3524 Lenape Ln	54847287 1501	None	Under Construction
WB Homes	Residential	42	4401 Main Rd W	54931437 7445	None	Planned

* Only location-specific hazard zones or vulnerabilities identified. With the exception of flood, wildfire, landslides, and land subsidence/sinkholes, all locations within the Lehigh Valley are exposed to the natural hazards addressed in this plan.

C. NATURAL HAZARD EVENT HISTORY SPECIFIC TO UPPER MILFORD TOWNSHIP

Type of Event and Date	FEMA Disaster # (if applicable)	Local Damage and Losses
TS Ivan Sept. 18-19, 2004	DR-1557	Debris removal, loss of some roadway sections loss of one stone arch culvert at Indian Creek and Swamp Total costs \$250K
Hurricane Irene Aug. 27-28, 2011	DR-4025	Localized damage to roadway shoulders; significant trees and limbs causing loss of electric service and road closings. Township costs \$10,000
Early snow storm Oct.29-31, 2011	Not declared	Trees were holding most of their leaves, 15" of heavy wet snow downed many large trees and limbs causing power loss and road closings due to downed trees and wires for several days This event was by far the worst natural emergency that Upper Milford Township endured. Losses approached \$150K.

D. HAZARD RISK/VULNERABILITY RISK RANKING

The following relative ranking of natural and non-natural hazard risks in this municipality was developed using PEMA's Risk Factor methodology described in Section 4, "Risk Assessment"

HAZARD RISK	NATURAL HAZARDS	RISK ASSESSMENT CATEGORY					RISK FACTOR (RF)
		PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	
HIGH	Winter Storm	3	2	4	1	3	2.7
	Flood	3	2	2	3	3	2.5
MODERATE	Radon Exposure	4	1	2	1	4	2.4
	Extreme Temperatures	4	1	2	1	3	2.3
	Drought	2	1	4	1	4	2.2
	Wildfire	3	1	2	3	3	2.2
	Hailstorm	3	1	3	2	1	2.1
	Wind, incl. Tornado	1	3	2	4	1	2.1
	Lightning	4	1	1	2	1	2
LOW	Subsidence / Sinkholes	2	2	2	2	1	1.9
	Earthquake	1	1	4	4	1	1.9
	Landslide	1	1	1	4	1	1.3

HAZARD RISK	MAN-MADE HAZARDS	RISK ASSESSMENT CATEGORY					RISK FACTOR (RF)
		PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	
HIGH	Fire (Urban/Structural)	4	2	1	4	2	2.6
	Environmental Hazard and	3	2	2	4	3	2.6
	Utility Interruption	3	1	3	4	3	2.5
MODERATE	Transportation Accident	4	1	1	4	1	2.2
	Mass Gathering and Civil Disturbance	3	1	1	4	2	2
	Terrorism	1	3	1	4	1	1.9
LOW	Building Collapse	1	3	1	4	1	1.9
	Dam Failure	1	2	2	4	2	1.9
	Nuclear Incident	1	1	1	4	2	1.4
	Levee Failure	0	0	0	0	0	0

E. CAPABILITY ASSESSMENT

This section identifies the following capabilities of the local jurisdiction:

- Planning and Regulatory Capability
- Administrative and Technical Capability
- Fiscal Capability
- Community Classifications

E.1 Planning and Regulatory Capability

Tool / Program	Status			Dept./Agency Responsible	Effect on Loss Reduction: + Support O Neutral - Hinder	Change Since Last Plan: + Positive - Negative	Comments
	In Place	Date Adopted or Updated	Under Development				
Hazard Mitigation Plan	X	1/1/06	X	County	+	+	
Emergency Operations Plan	X	5/27/05	X	Upper Milford Township (UMT) Board of Supervisors (BOS)	+	+	
Disaster Recovery Plan							
Evacuation Plan							
Continuity of Operations Plan							
NFIP	X	2004					Adoption includes most recent approved updates
NFIP – Community Rating System	X	2004					
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X	3/18/10		UMT Zoning	+	+	
Floodplain Management Plan	X	3/18/10		UMT Zoning	+	+	

Tool / Program	Status			Dept./Agency Responsible	Effect on Loss Reduction: + Support O Neutral - Hinder	Change Since Last Plan: + Positive - Negative	Comments
	In Place	Date Adopted or Updated	Under Development				
Zoning Regulations	X	3/18/10		Zoning / Planning	+	+	
Subdivision Regulations	X	3/18/10		Zoning / Planning	+	+	
Comprehensive Land Use Plan	X	5/19/05		Zoning / Planning (plan prepared by Southwestern Lehigh County Comprehensive Plan Committee)	+	+	Includes recommendations on the adoption of carbonate bedrock standards.
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	2008		Zoning / Planning	+	+	
Stormwater Management Plan / Ordinance	X	12/29/10		Zoning	+	+	
Natural Resource Protection Plan	X	3/18/10		Zoning	+	+	
Capital Improvement Plan							
Economic Development Plan							
Historic Preservation Plan							

Tool / Program	Status			Dept./Agency Responsible	Effect on Loss Reduction: + Support O Neutral - Hinder	Change Since Last Plan: + Positive - Negative	Comments
	In Place	Date Adopted or Updated	Under Development				
Farmland Preservation	X	3/18/10		Zoning	0	+	
Building Code	X	7/1/04		Building	+	+	
Fire Code	X	7/1/04		Building	+	+	
Firewise							
Storm Ready	X			Lehigh County			
Carbonate Bedrock Standard	X				+	+	

E.2 Administrative and Technical Capability

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X		Planning	
Planners or engineers (with natural and/or human caused hazards knowledge)	X		Township engineer consultant	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		Building depart 3 rd party consultants	
Emergency Manager	X		Emergency Management Coordinator (EMC)	
NFIP Floodplain Administrator	X		Zoning	
Land Surveyors	X		Township engineer consultants	
Scientists or staff familiar with the hazards of the community	X		Public works department	
Personnel skilled in Geographic Information Systems (GIS) and/or FEMA's HAZUS program	X		Planning / zoning	
Grant writers or fiscal staff to handle large/complex grants	X		General admin w/ consultant if needed	
Staff with expertise or training in Benefit-Cost Analysis				
Other				

E.3 Fiscal Capability

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming	X		General Administration	
Community Development Block Grants (CDBG)	X		General Administration	
Special Purpose Taxes	X		General Administration	
Gas / Electric Utility Fees		X	N/A	
Water / Sewer Fees		X	LCA	
Stormwater Utility Fees		X	N/A	
Development Impact Fees	X		General Administration	
General Obligation, Revenue, and/or Special Tax Bonds	X		General Administration	
Partnering Arrangements or Intergovernmental Agreements	X		General Administration & Public Works Department	
Other				

E.4 Community Classifications

Program	Classification	Date Classified
Community Rating System (CRS)	NP	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	TBD	TBD
Public Protection	TBD	TBD
Storm Ready	Lehigh County	TBD
Firewise	NP	N/A

N/A = Not applicable. NP = Not participating. 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. The CRS class applies to flood insurance while the BCEGS and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10 with class one (1) being the best possible classification, and class 10 representing no classification benefit. Firewise classifications include a higher classification when the subject property is located beyond 1000 feet of a creditable fire hydrant and is within 5 road miles of a recognized Fire Station. Storm Ready communities are better prepared to save lives from the onslaught of severe weather through advanced planning, education and awareness.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO's Public Protection website at <http://www.isomitigation.com/ppc/0000/ppc0001.html>
- The National Weather Service Storm Ready website at <http://www.weather.gov/stormready/howto.htm>
- The National Firewise Communities website at <http://firewise.org/>

F. MITIGATION STRATEGY

F.1 Past Mitigation Activities/Efforts

- The Township replaced the undersized culvert at Swamp Road and Indian Creek Road which has eliminated the repetitive flood loss for the home located adjacent to this culvert.
- The Township owns, maintains and regularly replaces equipment that is necessary to respond to emergency events such as backhoe, loader, heavy-duty single axle dump trucks with winter maintenance accessories and also operates a quality street sweeper to aid in aftermath cleanup.
- The Township adopted a Carbonate Bedrock Standard to mitigate the risk of sinkholes on new construction.

F.2 Hazard Vulnerabilities Identified

It is estimated that in Upper Milford Township, 168 residents live within the 1% annual chance flood area (NFIP Special Flood Hazard Area). Of the municipality's total land area, 4.5% is located within the 1% annual chance flood area. \$33,941,755 (2.9%) of the municipality's general building stock replacement cost value (structure and contents) is located within the 1% annual chance flood area (per municipal data).

There are 30 NFIP policies in the community. While there are 66 structures located within the 1% annual chance flood area, there are only 19 policies issued to property owners in the 1% annual chance flood area. FEMA has identified 2 Repetitive Loss (RL) and no Severe Repetitive Loss (SRL) properties in the municipality.

HAZUS-MH estimates that for a 1% annual chance flood, \$1,629,335 (.01%) of the municipality's general building stock replacement cost value (structure and contents) will be damaged, 277 people may be displaced, 87 people may seek short-term sheltering, and an estimated 930 tons of debris could be generated.

The following vulnerabilities have been identified by the community, within the risk assessment, or in other plan, reports and documents (e.g. FEMA Flood Insurance Studies, Act 167 Stormwater Management Plans):

- Minor damage to residential structures due to flooding, particularly noted on Chestnut Street between Batman and Toll Gate.
- Loss due to lengthy power outages due to the rural and extensively wooded nature of the township

Please refer to the Hazard Profiles for additional vulnerability information relevant to this jurisdiction.

F.3 Hazard Mitigation Strategy

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.

Action No.	Action	Mitigation Technique Category	Hazard(s) Addressed	Priority (H/M/L)	Estimated Cost	Potential Funding Sources	Lead Agency / Department	Implementation Schedule	Applies to New and/or Existing Structures*
1	Work along with electric utility to improve electric utility primary and secondary line clearing.	Property Protection; Natural Resource Protection (veg. mgt.)	Severe Storms (Wind); Severe Winter Storms	High	Medium	Private Sector, Municipal Budget	Township, working with electric utilities	Short Term	Existing
2	Maintain an adequate fleet of vehicles and equipment to handle anticipated emergency response.	Emergency Services	All Hazards	High	High	Municipal Budget; Homeland Security Grant and public protection emergency services grant programs	Municipality	On-going	N/A
3	Retrofit (e.g. elevate, flood-proof) structures located in hazard-prone areas to protect structures from future damage, with repetitive loss and severe repetitive loss properties as priority. Specifically identified are the following: - Residences on Chestnut Street between Batman and Toll Gate Phase 1: Identify appropriate candidates for retrofitting	Property Protection	Flood	High	High	FEMA Mitigation Grant Programs and local budget (or property owner) for cost share	Municipality (via Municipal Engineer/NFIP Floodplain Administrator) with support from PEMA, FEMA	Long Term DOF	Existing

Action No.	Action	Mitigation Technique Category	Hazard(s) Addressed	Priority (H/M/L)	Estimated Cost	Potential Funding Sources	Lead Agency / Department	Implementation Schedule	Applies to New and/or Existing Structures*
	<p>based on cost-effectiveness versus relocation.</p> <p>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.</p>								
4	<p>Purchase, or relocate structures located in hazard-prone areas to protect structures from future damage, with repetitive loss and severe repetitive loss properties as priority.</p> <p>Specifically identified are the following: - Residences on Chestnut Street between Batman and Toll Gate</p> <p>Phase 1: Identify appropriate candidates for relocation based on cost-effectiveness versus retrofitting.</p> <p>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.</p>	Property Protection	Flood	High	High	FEMA Mitigation Grant Programs and local budget (or property owner) for cost share	Municipality (via Municipal Engineer/NFIP Floodplain Administrator) with support from PEMA, FEMA	Long Term DOF	Existing
5	Maintain compliance with and	Property	Flood	High	Low -	Municipal	Municipality	On-going	New &

Action No.	Action	Mitigation Technique Category	Hazard(s) Addressed	Priority (H/M/L)	Estimated Cost	Potential Funding Sources	Lead Agency / Department	Implementation Schedule	Applies to New and/or Existing Structures*
	<p>good-standing in the NFIP including adoption and enforcement of floodplain management requirements (e.g. regulating all new and substantially improved construction in Special Hazard Flood Areas), floodplain identification and mapping, and flood insurance outreach to the community.</p> <p>Further, continue to meet and/or exceed the minimum NFIP standards and criteria through the following NFIP-related continued compliance actions identified below.</p>	Protection			Medium	Budget	(via Municipal Engineer/NFIP Floodplain Administrator) with support from PEMA, ISO FEMA		Existing
6	<p>Conduct and facilitate community and public education and outreach for residents and businesses to include, but not be limited to, the following to promote and effect natural hazard risk reduction: Provide and maintain links to the HMP website, and regularly post notices on the /municipal homepage(s) referencing the HMP webpages. Prepare and distribute informational letters to flood vulnerable property owners and neighborhood associations, explaining the availability of mitigation grant funding to mitigate their properties, and instructing them on how they can learn more and implement mitigation. Use email notification systems and newsletters to better educate the public on flood insurance, the availability of mitigation grant funding, and personal natural hazard risk reduction measures. Work with neighborhood associations, civic and business groups to disseminate information on flood insurance and the availability of mitigation grant funding.</p>								
	See above.	Public Education and Awareness	All Hazards	High	Low-Medium	Municipal Budget	Municipality with support from Planning Partners, PEMA, FEMA	Short Term	N/A
7	Begin the process to adopt higher regulatory standards to manage flood risk (i.e. increased freeboard, cumulative substantial damage/improvements).	Prevention	Flood	High	Low	Municipal Budget	Municipality (via Municipal Engineer/NFIP Floodplain Administrator) with support from PEMA,	Short Term	New & Existing

Action No.	Action	Mitigation Technique Category	Hazard(s) Addressed	Priority (H/M/L)	Estimated Cost	Potential Funding Sources	Lead Agency / Department	Implementation Schedule	Applies to New and/or Existing Structures*
							FEMA		
8	Determine if a Community Assistance Visit (CAV) or Community Assistance Contact (CAC) is needed, and schedule if needed.	Prevention, Property Protection	Flood	Medium	Low	Municipal Budget	NFIP Floodplain Administrator with support from PADEP, PEMA, FEMA	Short Term	N/A
9	Have designated NFIP Floodplain Administrator (FPA) become a Certified Floodplain Manager through the ASFPM, and pursue relevant continuing education training such as FEMA Benefit-Cost Analysis.	Public Education and Awareness	Flood	High	Low	Municipal Budget	NFIP Floodplain Administrator	Short Term DOF	N/A
10	Participate in the Community Rating System (CRS) to further manage flood risk and reduce flood insurance premiums for NFIP policyholders. This shall start with the submission to FEMA-DHS of a Letter of Intent to join CRS, followed by the completion and submission of an application to the program once the community's current compliance with the NFIP is established.	Prevention, Property Protection, Public Education and Awareness	Flood	Medium	Low	Municipal Budget	NFIP Floodplain Administrator with support from PADEP, PEMA, FEMA	Short Term	NA
11	Archive elevation certificates	Public Education and Awareness	Flood	High	Low	Municipal Budget	NFIP Floodplain Administrator	On-going	NA
12	Continue to support the implementation, monitoring, maintenance, and updating of this Plan, as defined in Section 7.0	All Categories	All Hazards	High	Low – High (for 5-year update)	Municipal Budget, possibly FEMA Mitigation	Municipality (via mitigation planning point of contacts) with support	On-going	New & Existing

Action No.	Action	Mitigation Technique Category	Hazard(s) Addressed	Priority (H/M/L)	Estimated Cost	Potential Funding Sources	Lead Agency / Department	Implementation Schedule	Applies to New and/or Existing Structures*
						Grant Funding for 5-year update	from Planning Partners (through their Points of Contact), PEMA		
13	Complete the ongoing updates of the Comprehensive Emergency Management Plans	Emergency Services	All Hazards	High	Low	Municipal Budget	Municipality with support from PEMA	On-going	New & Existing
14	Create/enhance/ maintain mutual aid agreements with neighboring communities for continuity of operations.	Emergency Services	All Hazards	High	Low	Municipal Budget	Municipality with support from Surrounding municipalities and County	On-going	New & Existing
15	Identify and develop agreements with entities that can provide support with FEMA/PEMA paperwork after disasters; qualified damage assessment personnel – Improve post-disaster capabilities – damage assessment; FEMA/PEMA paperwork compilation, submissions, record-keeping	Public Education and Awareness, Emergency Services	All Hazards	Medium	Medium	Municipal budget	Municipality with support from County, PEMA, FEMA	Short Term	NA
16	Work with regional agencies (i.e. County and PEMA) to help develop damage assessment capabilities at the local level through such things as training programs, certification of qualified individuals (e.g. code officials, floodplain managers, engineers).	Public Education and Awareness, Emergency Services	All Hazards	Medium	Medium	Municipal budget, FEMA HMA and HLS grant programs	Municipality with support from County, PEMA	Short Term DOF	NA

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.

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

Municipal mitigation actions were evaluated and prioritized primarily using the PA STEEL methodology discussed in Section 6 of this plan. Per the cost-benefit weighted PA STEEL methodology, those actions receiving 20 or more favorable ratings were generally considered high-priority actions. However, other factors beyond the PA STEEL numeric ranking may have been considered by the municipality during project prioritization. For example, a project might be assigned a medium priority because of the uncertainty of a funding source, and could be changed to high once a funding source has been identified such as a grant.

Mitigation Action		PA STEEL CRITERIA CONSIDERATIONS																				Results			
		(+) Favorable						(-) Less favorable						(N) Not Applicable											
		P Political			A Administrative			S Social		T Technical			E Economic			E Environmental					L Legal			SUMMARY (EQUAL WEIGHTING)	SUMMARY (BENEFITS & COSTS PRIORITIZED)
Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance / Operations	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Benefit of Action (x3)	Cost of Action (x3)	Contributes to Economic Goals	Outside Funding Required	Effect on Land / Water	Effect on Endangered Species	Effect on HAZMAT / Waste Site	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenge			
1	Better electric utility primary and secondary line clearing	+	+	-	+	-	+	-	+	+	-	+	+	N	+	-	N	+	+	+	+	+	-	15(+) 6(-) 2(N)	19(+) 6(-) 2(N)
2	Maintain fleet of vehicles/equipment for emergency response	+	+	-	N	-	+	N	N	N	N	+	+	N	+	N	N	N	N	N	N	+	N	7(+) 2(-) 14(N)	11(+) 2(-) 14(N)
3	Retrofit Vulnerable Properties	+	+	+	-	-	+	+	+	+	+	+	+	+	-	+	+	+	N	+	N	+	+	18(+) 3(-) 2(N)	22(+) 3(-) 2(N)

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4	Acquire Vulnerable Properties	+	+	+	-	-	-	+	-	+	+	+	+	+	+	-	+	+	+	+	+	N	+	+	17 (+) 5 (-) 1 (N)	21 (+) 5 (-) 1 (N)
5	Maintain NFIP compliance	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	N	+	+	N	+	-	19 (+) 2 (-) 2 (N)	23 (+) 2 (-) 2 (N)
6	Public Education and Outreach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	N	N	N	N	N	N	+	+	17 (+) 0 (-) 6 (N)	21 (+) 0 (-) 6 (N)
7	Higher Regulatory Standards	+	+	-	+	+	-	-	-	+	+	+	+	+	+	+	N	N	+	+	+	+	-	16 (+) 5 (-) 2 (N)	20 (+) 5 (-) 2 (N)	
8	Community Assistance Visit	+	+	+	+	+	-	+	+	+	N	N	+	+	+	+	N	N	N	N	+	N	+	-	14 (+) 2 (-) 7 (N)	18 (+) 2 (-) 7 (N)
9	NFIP FPA become a Certified Floodplain Manager	+	+	+	+	-	+	+	+	+	N	+	+	+	+	+	N	N	N	N	N	N	+	+	15 (+) 1 (-) 7 (N)	19 (+) 1 (-) 7 (N)
10	Join Community Rating System	+	+	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+	N	+	+	N	+	+	19 (+) 2 (-) 2 (N)	23 (+) 2 (-) 2 (N)
11	Archive Elevation Certificates	+	+	+	+	+	+	+	+	+	N	+	+	+	N	+	N	N	N	N	+	N	+	+	16 (+) 0 (-) 7 (N)	20 (+) 0 (-) 7 (N)
12	Support Plan Maintenance and Update	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	+	19 (+) 0 (-) 4 (N)	23 (+) 0 (-) 4 (N)
13	Update CEMP	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	N	+	N	+	+	+	+	20 (+) 0 (-) 3 (N)	24 (+) 0 (-) 3 (N)
14	Enhance Mutual Aid Agreements	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	N	+	N	+	N	+	+	19 (+) 0 (-) 3 (N)	23 (+) 0 (-) 0 (-)



																										3 (N)
15	Identify Post-Disaster Capabilities	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	N	N	N	+	N	+	+	18 (+) 1 (-) 4 (N)	22 (+) 4 (-) 4 (N)
16	Develop Post-Disaster Capabilities	+	+	+	-	-	+	+	+	+	+	+	-	+	-	+	N	N	N	+	N	+	+	15 (+) 4 (-) 4 (N)	17 (+) 6 (-) 4 (N)	

H. 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:

- Specific building information – first-floor elevation (elevation certificates), number of stories, foundation type, basement, square footage, occupancy type, year built, type of construction etc.
- Assessed or fair market value of structure
- LiDAR or high resolution DEM

I. HAZARD AREA EXTENT AND LOCATION

A hazard area extent and location map has been generated and is provided below for Upper Milford Township to illustrate the probable areas impacted within Upper Milford Township. This map is based on the best available data at the time of the preparation of this Plan, and is 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 Upper Milford Township has significant exposure. The Planning Area maps are provided in the hazard profiles within Section 4, Volume I of this Plan.

J. ADDITIONAL COMMENTS

No additional comments at this time.

