9.20 UPPER MACUNGIE TOWNSHIP

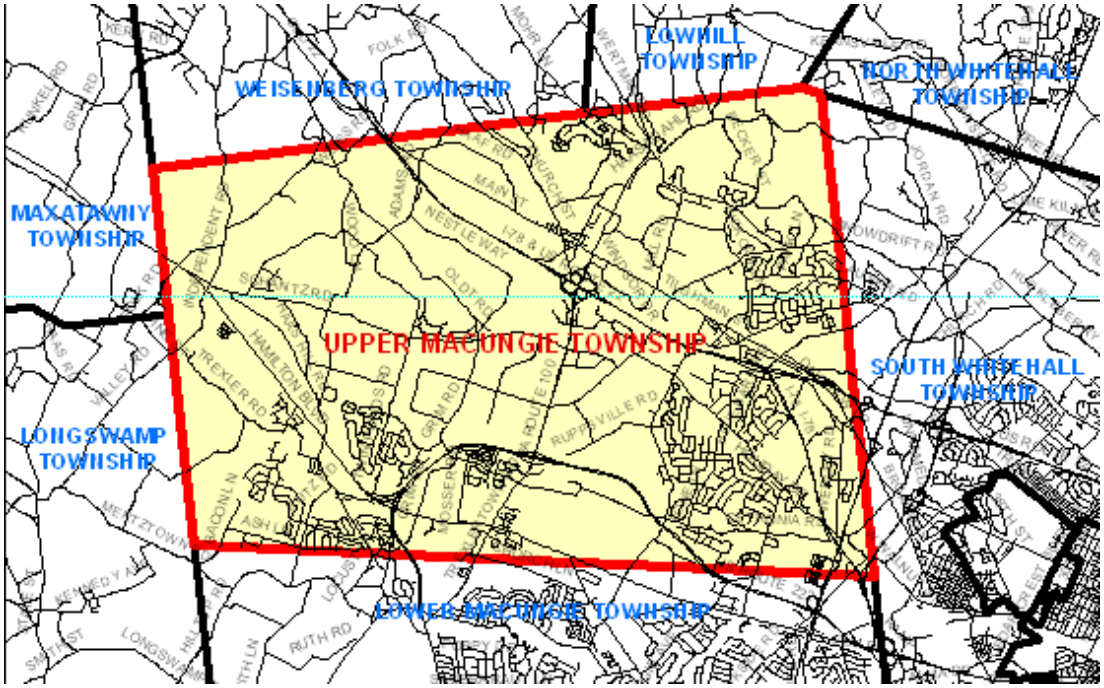
This section presents the jurisdictional annex for the Upper Macungie Township.

A. HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact		Alternate Point of Contact	
Name	Grant W. Grim	Name	Ken Molony
Title/ Department	Fire Commissioner	Title/ Department	DCD
Address	8330 Schantz Rd., Breiningsville, PA 19031	Address	
Telephone	610-395-4892 Ext. 27	Telephone	
Fax	610-395-9355	Fax	
Email	ggrim@uppermac.org	Email	

B. MUNICIPAL PROFILE

Upper Macungie Township is a mixed use (residential, commercial, industrial) community located in Lehigh County, just west of Allentown. Bounded by Maxatawny and Longswamp Township, Berks County to the west, Weisenberg and Lownhill Township to the north, North and South Whitehall to the east and Lower Macungie Township to the south. Based on the 2010 US Census its population is 20,063 and covers 26.24 square miles.



Source: Lehigh County GIS, May 2012

The Township's Main Corridors running south and north are: Route 100, and Route 309. Running west-to-east are: Interstate 78, Tilghman Street, Route 22 and Hamilton Boulevard.

The two watersheds that make up the Township are the Little Lehigh and Jordan Creek. The main tributaries are the Breinig Run, Hassen Creek, Iron Run, Little Cedar Creek and the Schaefer Run.

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.

Property Name	Type (Residential or Commercial)	Number of Structures	Location	Known Hazard Zone*	Description / Status
Lehigh Hills	Both	350	-	Hassen Creek	Buffer & Conservation Area
Parkland Fields	Residential	205	-	Cedar Tributary	Buffer & Conservation Area
Trexler Fields	Residential	232	-	Schaefer Run	Buffer & Conservation Area
Hidden Meadows	Residential	309	-	Cedar Tributary	Buffer & Conservation Area
Laurel Fields	Residential	232	-	Cedar Tributary	Buffer & Conservation Area
Highgate Dunbar	Residential	86	-	Breinig Run	Buffer & Conservation Area
Schaefer Run Commons	Residential	198	-	Schaefer Run	Buffer & Conservation Area

* 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.

Future and ongoing developments include: Lehigh Hills (residential and commercial development, Route 100 north of Tilghman Street), Trexler Fields (residential, Hamilton Boulevard west of Trexlertown), Highgate (residential, 222 Bypass north of Trexlertown), Parkland Fields (residential, between Schantz Road and I-78), Hidden Meadows (residential, between Werley Road and I-78), Laurel Fields (residential between Werley Road and the Pennsylvania Turnpike), Shaefer Run Commons (residential, Schaefer Run Road, west of 222 Bypass) and Highgate Dunbar (residential, Grim Road, west of 222 Bypass). In each of these developments no construction is proposed within the 100 Year Floodplain except roadway crossings which have been designed and permitted by Pennsylvania Department of Environmental Protection Joint Permits.

C. NATURAL HAZARD EVENT HISTORY SPECIFIC TO UPPER MACUNGIE TOWNSHIP

No event occurred specifically to Upper Macungie Township. Hurricane Ivan was the most recent event resulting roadway flooding, some wet basements and swale and channel damage.

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	Subsidence / Sinkholes	2	3	3	2	1	2.4
	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	Earthquake	1	1	4	4	1	1.9
	Landslide	1	1	3	4	1	1.7

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
MOD - ERATE	Transportation Accident	4	1	1	4	1	2.2
	Mass Gathering and Civil Disturbance	3	1	1	4	2	2
LOW	Terrorism	1	3	1	4	1	1.9
	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 Develop-ment				
Hazard Mitigation Plan	X	7/2006		Lehigh County	+	+	
Emergency Operations Plan	X	2/2/2012		Upper Macungie Township (UMT)	+	+	
Disaster Recovery Plan							
Evacuation Plan	X	12/2011		Lehigh County	+	+	
Continuity of Operations Plan	X	2/2/2012		Upper Macungie Township	+	+	Part of E.O.P.
NFIP							
NFIP – Community Rating System							
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)							
Floodplain Management Plan	X	2/6/2002			+	+	
Zoning Regulations	X	2001		UMT Community Development	+	+	

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 Develop-ment				
Subdivision Regulations	X	2001		UMT Community Development	+	+	
Comprehensive Land Use Plan (or General, Master or Growth Mgt. Plan)	X	2007		UMT Community Development	+	+	
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	2001		UMT Community Development	+	+	
Stormwater Management Plan / Ordinance	X	2001, 2011		UMT Community Development	+	+	
Natural Resource Protection Plan							
Capital Improvement Plan							
Economic Development Plan							
Historic Preservation Plan							
Farmland Preservation	X	2001, 2011		UMT Community Development	+	+	
Building Code	X	12/31/2010		Upper Macungie Township	+	+	
Fire Code	X	12/31/2010		Upper Macungie Township	+	+	
Firewise							

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 Develop-ment				
Storm Ready	X	1/2012		Lehigh County	+	+	
Other							

E.2 Administrative and Technical Capability

Staff/Personnel Resources	Yes	No	Department/Agency	Comments
Planners (with land use / land development knowledge)	X		Upper Macungie Township Community Development	
Planners or engineers (with natural and/or human caused hazards knowledge)	X		Keystone Consulting Engineers	
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X		Keystone Consulting Engineers	
Emergency Manager	X		Grant W. Grim	
NFIP Floodplain Administrator		X		
Land Surveyors	X		Keystone Consulting Engineers	
Scientists or staff familiar with the hazards of the community	X		Upper Macungie Township Fire Inspectors	
Personnel skilled in Geographic Information Systems (GIS) and/or FEMA's HAZUS program	X		Keystone Consulting Engineers, Upper Macungie Township Staff	
Grant writers or fiscal staff to handle large/complex grants	X		Keystone Consulting Engineers	
Staff with expertise or training in Benefit-Cost Analysis	X		Upper Macungie Township Financial Manager	
Other				

E.3 Fiscal Capability

Financial Resources	Yes	No	Department/Agency	Comments
Capital Improvement Programming		X		
Community Development Block Grants (CDBG)		X		
Special Purpose Taxes	X		Upper Macungie Township	Local services tax
Gas / Electric Utility Fees		X		
Water / Sewer Fees	X		Upper Macungie Township Sewer Authority	
Stormwater Utility Fees		X		
Development Impact Fees	X		Upper Macungie Township	
General Obligation, Revenue, and/or Special Tax Bonds	X		Upper Macungie Township	
Partnering Arrangements or Intergovernmental Agreements	X		PennDOT	Snow plowing agreement
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 it's 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

- Protect 500/ 100 year floodplain through ordinances
- Establish Riparian Buffers
- Purchased generators for certain municipal infrastructure (sewer, traffic signals, etc.)
- Conservation Design Ordinance, cluster buildings away from environmentally sensitive areas
- Adopted Carbonate Bedrock Standard to mitigate sinkhole risk on new development

F.2 Hazard Vulnerabilities Identified

It is estimated that in Upper Macungie Township, 165 residents live within the 1% annual chance flood area (NFIP Special Flood Hazard Area). Of the municipality's total land area, 3.6% is located within the

1% annual chance flood area. $34,502,731 (0.3%) of the municipality's general building stock replacement cost value (structure and contents) is located within the 1% annual chance flood area.

There are 34 NFIP policies in the community. While there are 65 structures located within the 1% annual chance flood area, there are only 5 policies issued to property owners in the 1% annual chance flood area. FEMA has not identified any Repetitive Loss (RL) or Severe Repetitive Loss (SRL) properties in the municipality.

HAZUS-MH estimates that for a 1% annual chance flood, $1,175,439 (0.01%) of the municipality's general building stock replacement cost value (structure and contents) will be damaged, 234 people may be displaced, 82 people may seek short-term sheltering, and an estimated 2,218 tons of debris could be generated.

HAZUS-MH estimates the following damage and loss of use to critical facilities in the community as a result of a 1% annual chance flood event:

Critical Facilities Located in the DFIRM 1% and 0.2% Flood Boundaries and Estimated Potential Damage from the 1% Flood Event

Name	Type	Exposure		Potential Loss from 1% Flood Event		
		1% Event	0.2% Event	Structure Damage	Content Damages	Days to 100-Percent Functional
TREXLERTOWN GOOD WILL FIRE CO #1	Fire	X	X	1.8	2.0	1.8
COMMONWEALTH OF PA	User Defined (Gov)	X	X	0.0	0.0	0.0
PENNA POWER & LIGHT CO	Electric Power	X	X	-	-	-
City of Allentown (owner)	User Defined (Gov)		X	-	-	-

Source: FEMA, 2004; FEMA, 2011; HAZUS-MH 2.1
Notes:
X = indicates the facility location as provided by Lehigh Valley is located in the DFIRM flood zone.
NA = HAZUS-MH 2.1 does not estimate the days to 100-percent functional for user-defined facilities.
- = There is no damage estimate either because the 0.2% annual chance flood event potential loss estimates were not run in HAZUS or HAZUS did not calculate potential loss estimates for some facilities located in the DFIRM flood hazard zone. This is because even though these facilities are located within the boundary of the flood depth grid generated by HAZUS the depth of flooding does not amount to any damages to the structure or contents according to the depth damage function used in HAZUS.

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):

- Fogelsville Pond Dam
- Sinkholes
- Trees in waterways
- Utility lines
- Railroad Crossing

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	Fogelsville Dam Remediation (see Section J – Additional Comments)	Structural Project	Dam Failure; Flood	High	High	DEP, DCNR, PFBC, FEMA, Local Budget	DEP, Municipality (via Municipal Engineer/NFIP Floodplain Administrator) with support from FEMA	Long Term DOF	Existing
2	Retrofit 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: - Trexler Road Bridge Phase 1: Identify appropriate candidates for retrofitting based on cost-effectiveness versus relocation. 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.	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*
3	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. Phase 1: Identify appropriate candidates for relocation based on cost-effectiveness versus retrofitting. 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.	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
4	Maintain compliance with and 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. Further, continue to meet and/or exceed the minimum NFIP standards and criteria through the following NFIP-related continued compliance	Property Protection	Flood	High	Low - Medium	Municipal Budget	Municipality (via Municipal Engineer/NFIP Floodplain Administrator) with support from PEMA, ISO FEMA	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*
	actions identified below.								
5	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 County/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.								
	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
6	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, FEMA	Short Term	New & Existing
7	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
8	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
9	Participate in the Community	Prevention,	Flood	Medium	Low	Municipal	NFIP	Short Term	NA

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*
	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.	Property Protection, Public Education and Awareness				Budget	Floodplain Administrator with support from PADEP, PEMA, FEMA		
10	Archive elevation certificates	Public Education and Awareness	Flood	High	Low	Municipal Budget	NFIP Floodplain Administrator	On-going	NA
11	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 Grant Funding for 5-year update	Municipality (via mitigation planning point of contacts) with support from Planning Partners (through their Points of Contact), PEMA	On-going	New & Existing
12	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
13	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

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*
14	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
15	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 (+) Favorable (-) Less favorable (N) Not Applicable																						Results	
		P Political			A Administrative			S Social		T Technical			E Economic				E Environmental					L Legal			SUMMARY (EQUAL WEIGHTING)	SUMMARY (BENEFITS & COSTS PRIORITIZED)
NO.	Name	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	Fogelsville Dam Remediation	+	+	-	+	-	+	+	+	+	+	N	+	+	N	+	N	N	N	N	+	N	+	+	14+ 2- 7N	20+ 2- 7N
2	Retrofit	+	+	+	-	-	+	+	+	+	+	+	+	+	+	-	+	+	+	N	+	N	+	+	18 (+) 3 (-) 2 (N)	22 (+) 3 (-) 2 (N)
3	Acquire	+	+	+	-	-	-	+	-	+	+	+	+	+	+	-	+	+	+	+	+	N	+	+	17 (+) 5 (-) 1 (N)	21 (+) 5 (-) 1 (N)
4	Maintain NFIP compliance	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	N	+	+	N	+	-	19 (+) 2 (-) 2 (N)	23 (+) 2 (-) 2 (N)

5	Public Education and Outreach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	N	N	N	N	N	+	+	17 (+) 0 (-) 6 (N)	21 (+) 0 (-) 6 (N)
6	Higher Regulatory Standards	+	+	-	+	+	-	-	-	+	+	+	+	+	+	+	+	N	N	+	+	+	+	-	16 (+) 5 (-) 2 (N)	20 (+) 5 (-) 2 (N)
7	Community Assistance Visit	+	+	+	+	+	-	+	+	+	N	N	+	+	+	+	N	N	N	N	+	N	+	-	14 (+) 2 (-) 7 (N)	18 (+) 2 (-) 7 (N)
8	NFIP FPA become a Certified Floodplain Manager	+	+	+	+	-	+	+	+	+	N	+	+	+	+	+	N	N	N	N	N	N	+	+	15 (+) 1 (-) 7 (N)	19 (+) 1 (-) 7 (N)
9	Join Community Rating System	+	+	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+	N	+	+	N	+	+	19 (+) 2 (-) 2 (N)	23 (+) 2 (-) 2 (N)
10	Archive Elevation Certificates	+	+	+	+	+	+	+	+	+	N	+	+	+	N	+	N	N	N	N	+	N	+	+	16 (+) 0 (-) 7 (N)	20 (+) 0 (-) 7 (N)
11	Support Plan Maintenance and Update	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	+	19 (+) 0 (-) 4 (N)	23 (+) 0 (-) 4 (N)
12	Update CEMP	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	N	+	N	+	+	+	+	20 (+) 0 (-) 3 (N)	24 (+) 0 (-) 3 (N)
13	Enhance Mutual Aid Agreements	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	N	+	N	+	N	+	+	19 (+) 0 (-) 3 (N)	23 (+) 0 (-) 3 (N)
14	Identify Post-Disaster Capabilities	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	N	N	N	+	N	+	+	18 (+) 1 (-) 4 (N)	22 (+) 4 (-) 4 (N)
15	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

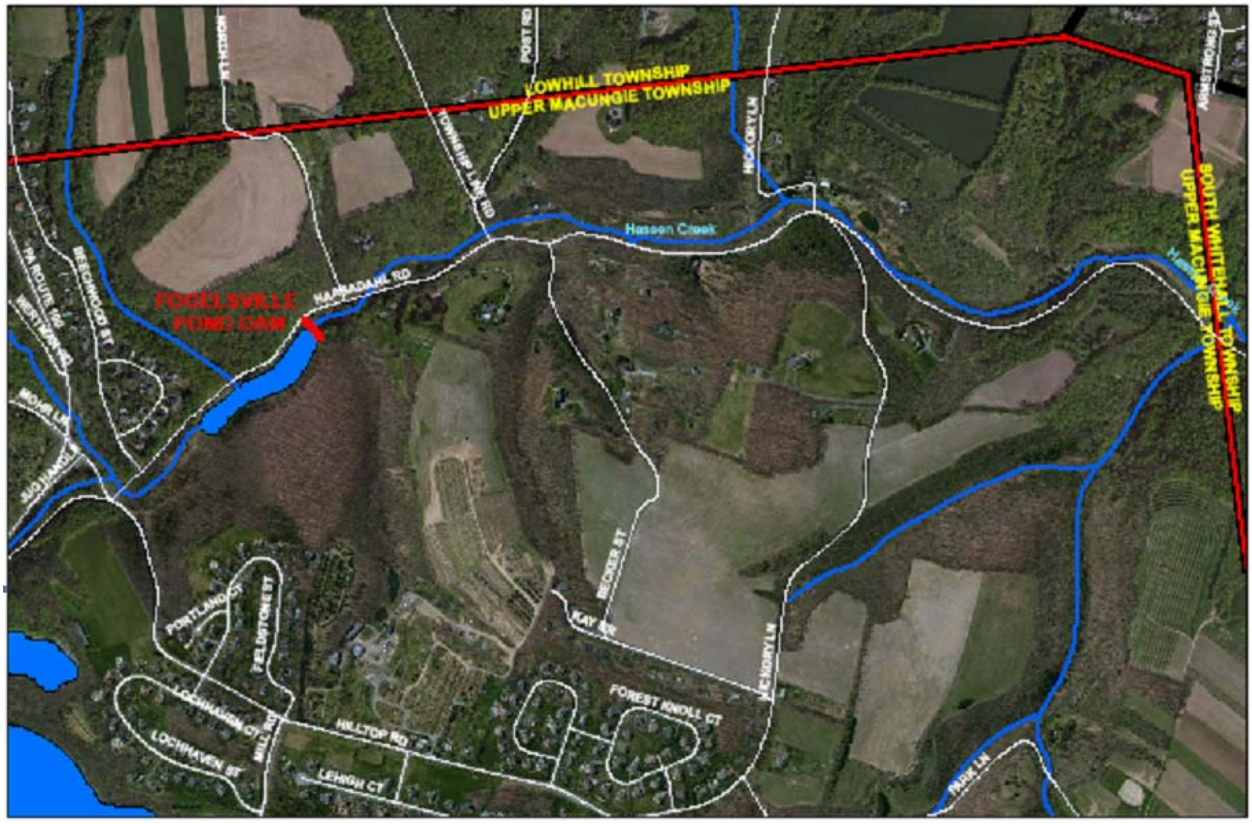
A hazard area extent and location map has been generated and is provided below for Upper Macungie Township to illustrate the probable areas impacted within This map is based on the best available data at the time of the preparation of this Plan, and is considered to be adequate for planning purposes. Maps have only been generated for those hazards that can be clearly identified using mapping techniques and technologies, and for which Upper Macungie Township has significant exposure. The Planning Area maps are provided in the hazard profiles within Section 4, Volume I of this Plan.

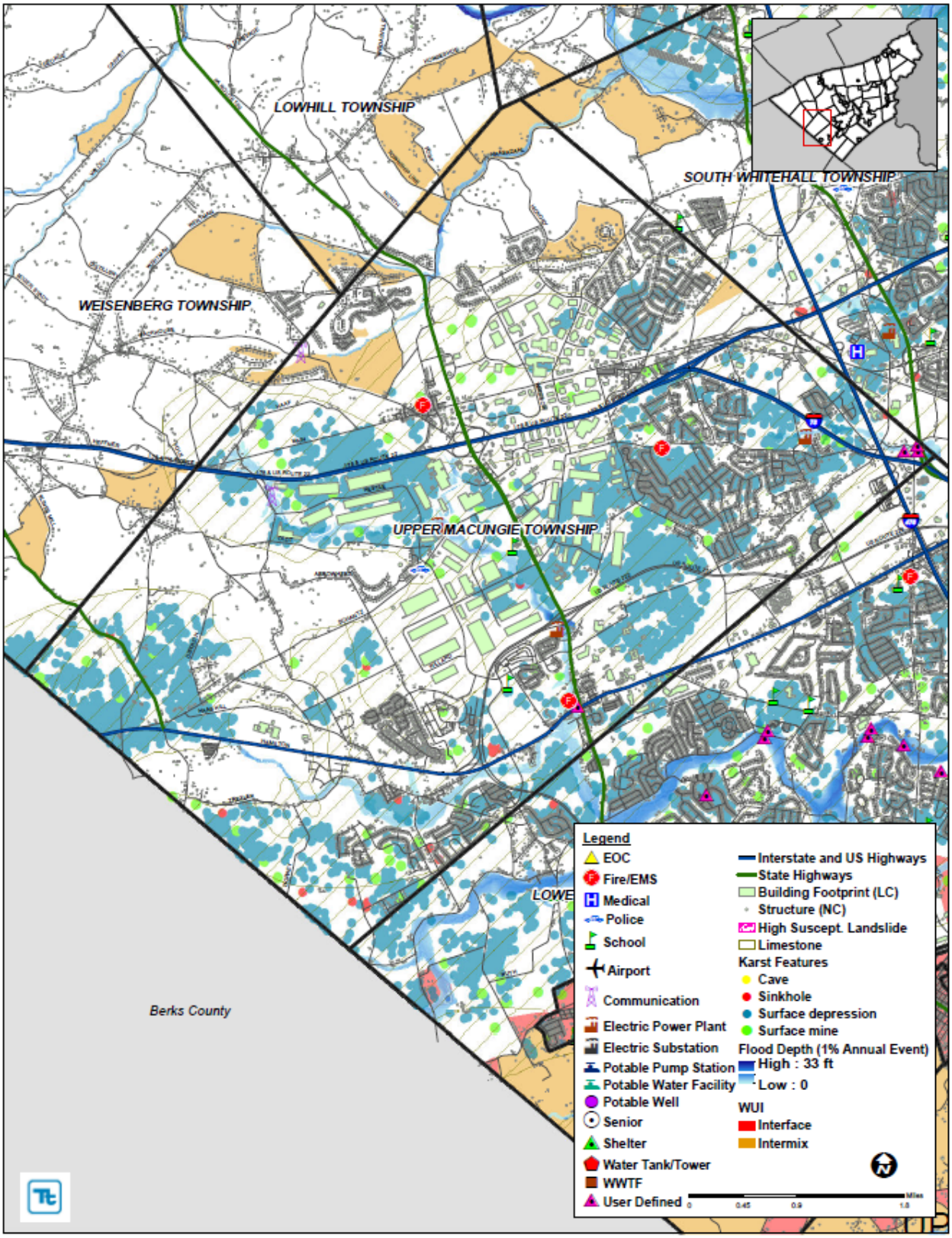
J. ADDITIONAL COMMENTS

The Fogelsville Dam was built by the Lehigh Portland Cement Company in and around 1914 but never permitted. The lands and the dam were donated to Lehigh County sometime 1950 - 1970. The Pennsylvania Department of Environmental Protection (DEP) Agency instituted a Dam Inventory and Permit Program in 1978 but failed to identify the Fogelsville Dam which ***is*** shown on the USGS Maps. Upper Macungie Township acquired the lands including the park and quarries in 1997. In 2008 DEP performed an inspection of the dam and notified the Township that it needs to be permitted and maintained or breached. Since the dam has not been maintained for 50 years the outlet control structure is no longer operable.

The township seeks to complete an Emergency Action Plan (EAP) with the County and State; and, seek Planning and Funding to reduce the hazard status of this dam.

The dam is now included in the County Emergency Management Plan and the Township has completed an EAP for DEP. As part of this plan the Township agrees to make certain repairs, perform annual inspections and to add a 6’ high fence to both sides of the breast of the dam with signage saying “No “Trespassing” and “No Fishing”.


LOWHILL TOWNSHIP
UPPER MACUNGIE TOWNSHIP
Hassen Creek
FOGELSVILLE POND DAM
HAMMAKAHL RD
SOUTH WHITEHALL TOWNSHIP
UPPER MACUNGIE TOWNSHIP
BEECHWOOD ST
BECKER ST
KAY DR
FOREST KNOLL CT
HILLTOP RD
LEHIGH CT
LOCHHAVEN ST
PARK LN


LOWHILL TOWNSHIP
SOUTH WHITEHALL TOWNSHIP
WEISENBERG TOWNSHIP
UPPER MACUNGIE TOWNSHIP
Berks County
Legend
EOC
Fire/EMS
Medical
Police
School
Airport
Communication
Electric Power Plant
Electric Substation
Potable Pump Station
Potable Water Facility
Potable Well
Senior
Shelter
Water Tank/Tower
WWTF
User Defined
Interstate and US Highways
State Highways
Building Footprint (LC)
Structure (NC)
High Suscept. Landslide
Limestone
Karst Features
Cave
Sinkhole
Surface depression
Surface mine
Flood Depth (1% Annual Event)
High : 33 ft
Low : 0
WUI
Interface
Intermix
Miles
0
0.45
0.9
1.8