

## 9.22 UPPER SAUCON TOWNSHIP

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

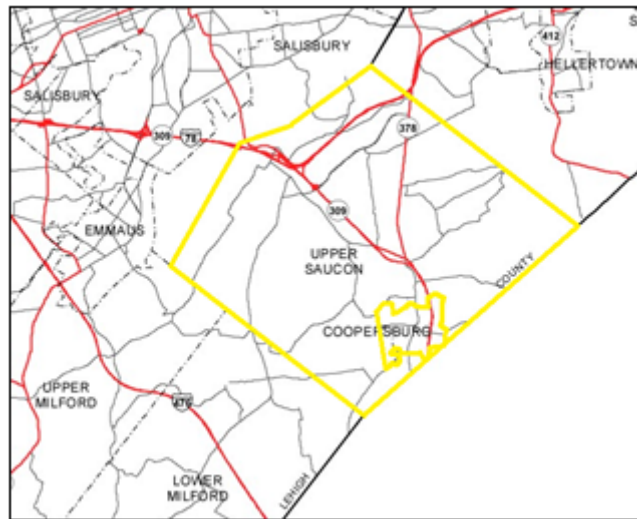
### A. HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact		Alternate Point of Contact	
<u>Name</u>	Thomas F. Beil	<u>Name</u>	Charles E. Castetter, Jr.
<u>Title/</u>	Township Manager	<u>Title/</u>	Fire Chief
<u>Department</u>	5500 Camp Meeting Road, Center Valley,	<u>Department</u>	4445 W. Hopewell Road, Center
<u>Address</u>	PA 18034	<u>Address</u>	Valley, PA 18034
<u>Telephone</u>	610-282-1171, Ext. 3	<u>Telephone</u>	610-791-0266
<u>Fax</u>	610-282-3557	<u>Fax</u>	610-791-2727
<u>Email</u>	<a href="mailto:tbeil@uppersaucon.org">tbeil@uppersaucon.org</a>	<u>Email</u>	<a href="mailto:Usfd2701@rcn.com">Usfd2701@rcn.com</a>

### B. MUNICIPAL PROFILE

Upper Saucon Township is located in the southwestern corner of Lehigh County, along the borders of Bucks County and Northampton County. The township encompasses a land area of 24.7 square miles, and has a population of 14,808 (2010 Census). As shown in Figure 1, Upper Saucon is bordered by Lower Saucon Township (Northampton County) to the northeast; Bucks County to the southeast; Lower Milford and Upper Milford townships (both Lehigh County) to the southwest; and Salisbury to the west and northwest. Coopersburg Borough is located in the southeastern part of Upper Saucon Township.

Figure 1



(Source: <http://www.lvpc.org/pdf/maps/baseMap-LehighNorthamptonCounties.pdf>)

Upper Saucon is in the Delaware River watershed, and the majority of the township is drained by the Saucon Creek into the Lehigh River. However, a small area in the extreme south of the township is drained by the Unami Creek, which flows into the Perkiomen Creek and then the Schuylkill River. There are many small standing bodies of water scattered throughout the township, mostly located around parks and in the vicinity of the aforementioned streams and creeks.

Interstate 78 runs north-south through the north-central part of the township, before turning east towards Lower Saucon Township, Northampton County. Route 309 is the primary north-south route serving Upper Saucon Township. Route 309 enters the township coming north from Philadelphia, via Quakertown, and joins Interstate 78 in the northern part of the township, coming west from New York City, and proceeds towards Allentown. Other north-south routes serving Upper Saucon are Route 145 and 378. Route 145 comes south from Allentown, merging with Rt. 309 at its split with I-78. Route 378 comes from Bethlehem, entering the township from the northeast to meet 309 in the south-central part of Upper Saucon.

Primary local routes include Locust Valley Road, which runs east-west in the lower west part of the township, and Blue Church Road, also in the southwest running east-west north of Locust Valley Road. Limeport Pike runs east-west from Lower Macungie Township on a slight north-east route to the I-78 Rt. 309 intersection in northern Upper Saucon, and Oakhurst Drive/Vera Cruz Road follows a similar route further north in the township but then continues southeast through Upper Saucon and into Northampton County. South of Oakhurst Drive, Center Valley Parkway/Saucon Valley Road travels east-west through the center of the township, meeting with Limeport Pike just west of Route 309, and continuing east into Lower Saucon Township, Northampton County.

### 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
Blue Belle Farms	Res.	125	Weyhill Drive		Single-family development, approved
Traditions of America	Res.	200	Lanark Road		Age-Qualified Community, proposed
Brinley Court	Res.	214	7535 S. Main St.		Townhomes, proposed
Crossroads	Res.	32	Locust Valley Road		Single-family development, approved
Epernay	Res.	34	5473 Landis Mill Road	Floodplain	Condos, under construction
Liberty Village	Res.	350	Liberty Road		SFD & Townhomes, under construction
Locust Manor	Res.	20	Locust Valley Rd.		SFD, under construction
Locust Valley Est.	Res.	33	Locust Valley Rd.		SFD, under construction
Mountain Glen	Res.	35	Oakhurst Drive		SFD, under construction
Old Saucon	Res.	80	4373 Route 378		Age-qualified Community,

					proposed
Toscana	Res.	43	2175 Flint Hill Rd.		Single-family development, approved
Whispering Pines	Res.	86	Liberty Road	Floodplain	SFD, under construction

\* 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 SAUCON TOWNSHIP**

Type of Event and Date	FEMA Disaster # (if applicable)	Local Damage and Losses
Hurricane Irene (August 28, 2011)	4025	Severe street flooding at many locations listed in table F3. Over 130 hours Public Works time and equipment for cleanup of downed trees, debris. Loss of signal control box at PA 309 & W. Saucon Valley Rd. (\$38,000). Police vehicle flooded (\$2,000).
Snowstorm (October 30, 2011)		Many trees and power lines down in rural section of Township. Over 400 hours Public Works time and equipment for cleanup of downed trees, debris.
Rainstorm (May 21, 2012)		Heavy rain and flash-flood caused severe street flooding at many locations listed in table F3.



**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	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
	Dam Failure	1	3	2	4	2	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
	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	2006		Upper Saucon Township	+		Updating 2012
Emergency Operations Plan	X	2006	X	Upper Saucon Township			Updating 2012
Disaster Recovery Plan							
Evacuation Plan							
Continuity of Operations Plan							
NFIP	X						
NFIP – Community Rating System							
Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance)	X			Upper Saucon Township	+	+	Floodplain regulations in Zoning Ordinance
Floodplain Management Plan							
Zoning Regulations	X	2009		Upper Saucon Township	+	+	
Subdivision Regulations	X	2011		Upper Saucon Township	+	+	
Comprehensive Land Use Plan (or General, Master or Growth Mgt.	X	2011		Upper Saucon Township	+	+	



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				
Plan)							
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	2006		Upper Saucon Township	0		
Stormwater Management Plan / Ordinance	X	2011		Upper Saucon Township	+	+	Ord. 108-B
Natural Resource Protection Plan							
Capital Improvement Plan	X	2011		Upper Saucon Township	+	+	Updated annually with budget
Economic Development Plan							
Historic Preservation Plan							
Farmland Preservation							
Building Code	X			Codemaster, Inc.	+	+	Statewide Building Code
Fire Code							
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		Upper Saucon Township	In-House Planning Dept.
Planners or engineers (with natural and/or human caused hazards knowledge)	X		Upper Saucon Township	In-House Planning Dept.
Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors)	X			Consultant
Emergency Manager	X			Emergency Personnel
NFIP Floodplain Administrator		X		
Land Surveyors		X		
Scientists or staff familiar with the hazards of the community	X		Upper Saucon Township	Consultant
Personnel skilled in Geographic Information Systems (GIS) and/or FEMA's HAZUS program	X		Upper Saucon Township	Consultant
Grant writers or fiscal staff to handle large/complex grants	X		Upper Saucon Township	
Staff with expertise or training in Benefit-Cost Analysis	X		Upper Saucon Township	
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			
Gas / Electric Utility Fees		X		
Water / Sewer Fees	X			
Stormwater Utility Fees		X		
Development Impact Fees	X			
General Obligation, Revenue, and/or Special Tax Bonds	X			
Partnering Arrangements or Intergovernmental Agreements	X			
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 following table summarizes progress on the mitigation strategy identified by the Township in the 2006 plan.

2006 Initiative		Status	Review Comments
Description	Location		
Property and roadway flooding	E. Valley Rd. at bridge over Saucon Creek	No progress / Unknown	
Roadway flooding	Kozy Korner Rd. at bridge over Saucon Creek	No progress / Unknown	
Property and roadway flooding	Camp Meeting Rd. between	No progress /	

SECTION 9.22: UPPER SAUCON TOWNSHIP

	Preston Ln. and Muirfield Rd.	Unknown	
Roadway flooding	Lanark Rd. at intersection with Saucon Valley Rd.	No progress / Unknown	
Roadway flooding	Rt. 309 and Saucon Valley Rd.	No progress / Unknown	
Businesses impacted by flooding	6301 N. Main St.	Completed	PennDOT made minor drainage improvements as part of Main Street bridge replacement project.
Property and roadway flooding	Vera Cruz Rd. just north of private street known as Sescher Ln.	No progress / Unknown	
Property and roadway flooding	Lanark Rd. at intersection with Chestnut Dr. and downstream area along Apple Ln. and Orchard Dr.	No progress / Unknown	
Roadway flooding	Route 309 at Hopewell Rd.	No progress / Unknown	
Property and roadway flooding	Bowood St. between Spring Dr. and West Hopewell Rd.	In Progress / Not Yet Complete	Engineering and design completed. Drainage improvements to be constructed in 2012.
Roadway flooding	N. Main St. near intersection with Liberty Rd.	Completed	PennDOT made minor drainage improvements as part of Main Street bridge replacement project.
Roadway flooding	Jacoby Rd. near intersection with Suter Rd.	No progress / Unknown	
Roadway flooding	Jacoby Rd. at Tumble Brook culvert	No progress / Unknown	
Property flooding	Southern section of Whitetail Dr.	No progress / Unknown	
Property and roadway flooding	2402 Spring Valley Rd.	Completed	PennDOT completed drainage improvements along Spring Valley Rd.
Roadway flooding	Blue Church Rd. South near intersection with State St.	No progress / Unknown	
Property and roadway flooding	West Hopewell Rd.	No progress / Unknown	
Property and roadway flooding	2097 Black River Rd.	No progress / Unknown	
Property flooding	5895 Glen Rd.	No progress / Unknown	
Property and roadway flooding	5151 West Hopewell Rd.	No progress / Unknown	

The following projects, identified in the 2006 Plan, have been completed in the Township:

- Business impacted by flooding at 6301 N. Main Street – PennDOT made minor drainage improvements as part of the Main Street bridge replacement project.



- Roadway flooding at N. Main Street near intersection with Liberty Road - PennDOT made minor drainage improvements as part of the Main Street bridge replacement project.
- Property and roadway flooding at 2402 Spring Valley Road – PennDOT completed drainage improvements along Valley Road.
- Elevated traffic signal controller box at intersection of Rt. 309 and Center Valley Parkway/Saucon Valley Road.
- 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 Saucon Township, 56 residents live within the 1% annual chance flood area (NFIP Special Flood Hazard Area). Of the municipality's total land area, 4.6% is located within the 1% annual chance flood area. \$119,843,915 (3.8%) of the municipality's general building stock replacement cost value (structure and contents) is located within the 1% annual chance flood area.

There are 28 NFIP policies in the community. While there are 22 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 identified no Repetitive Loss (RL) or Severe Repetitive Loss (SRL) properties in the municipality.

HAZUS-MH estimates that for a 1% annual chance flood, \$845,309 (0%) of the municipality's general building stock replacement cost value (structure and contents) will be damaged, 174 people may be displaced, 47 people may seek short-term sheltering, and an estimated 686 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):

- Property damage due to flooding during Hurricane Irene:
  - Intersection of Rt. 309 and Center Valley parkway/Saucon Valley Road, where four vehicles were rendered inoperative due to rising flood waters.
  - 4664 Camp Meeting Road. – A home sustained extensive flood damage.
  - Intersection of Rt. 309 and Center Valley Parkway/Saucon Valley Road – flood waters cause extensive damage to electrical components in traffic signal controller box.
  - Intersection of Rt. 309 and W. Hopewell Rd. – vehicle rendered inoperable due to rising flood water.
  - 6301 N. Main St. – business sustained extensive flood damage.

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	Widen Camp Meeting Rd. bridge over Saucon Creek so more water can flow under bridge instead of backing up on to property at 4664 Camp Meeting Road.	Property Protection, Structural Projects	Flood	Medium	High	FEMA mitigation grant funding; local budget for match	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
2	Property and roadway flooding along East Valley Road between Camp Meeting Road and Courtney Drive at the bridge over the Saucon Creek - Mitigate major street/ private property flooding by replacing the existing East Valley Road bridge over the Saucon Creek and improving the upstream and downstream conditions.	Property Protection, Structural Projects	Flood	Medium	High	FEMA mitigation grant funding; local budget for match	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
3	Drainage improvements/detention pond to alleviate flooding at intersection of Rt. 309 and Center Valley Parkway/Saucon Valley Road.	Property Protection, Structural Projects	Flood	High	High	FEMA mitigation grant funding; local budget for match	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
4	Roadway flooding along Route 309 and Saucon Valley Road intersection - Mitigate major highway flooding by replacing the existing Route 309 bridge	Property Protection, Structural Projects	Flood	High	High	FEMA mitigation grant funding; local budget for	Township Engineering and Public Works, with support from the Pidcock	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*
	over the Saucon Creek and elevate Route 309 and Saucon Valley Road as necessary.					match	Company		
5	5895 Glen Road – Mitigate local street/property flooding by installing a small storm sewer system.	Property Protection, Structural Projects	Flood	Low	Medium	Municipal Budget	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
6	5151 West Hopewell Road – Mitigate local street flooding by installing inlets and storm sewer pipes.	Property Protection, Structural Projects	Flood	Low	Medium	Municipal Budget	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
7	Roadway flooding along Blue Church Road South near the intersection with State Street – Mitigate street flooding by installing properly sized storm sewer pipe and associated inlets beneath Blue Church Road South.	Property Protection, Structural Projects	Flood	Low	Medium	Municipal Budget	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
8	Property and roadway flooding along Bowood Street between Spring Drive and Hopewell Road – Install storm sewer, replace concrete gutter curb and mil / overlay along Bowood Street and each intersection for improved drainage.	Property Protection, Structural Projects	Flood	High	Medium	Municipal Budget	Township Engineering and Public Works, with support from the Pidcock Company	On-going – Engineering and design complete. Construction 2012.	Existing
9	Property and roadway flooding along Camp Meeting Road between Preston Lane and Muirfield Road – mitigate	Property Protection, Structural Projects	Flood	Medium	High	FEMA mitigation grant funding;	Township Engineering and Public Works, with	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*
	street/private property flooding by installing inlets and storm sewer along Camp Meeting Road.					State highways, local budget for match	support from the Pidcock Company		
10	Roadway flooding along Chestnut Drive from the Lanark Road intersection to the intersections with Orchard Drive and Apple Lane and then along Orchard Drive and Apple Lane to West Hopewell Road - Mitigate significant street flooding with the installation of inlets and storm sewer pipes to convey the stormwater.	Property Protection, Structural Projects	Flood	Medium	High	FEMA mitigation grant funding; local budget for match	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
11	Roadway flooding and icing along 2097 Black River Road - Mitigate street flooding and road icing by installing a storm sewer system along a section of Black River Road.	Property Protection, Structural Projects	Flood, Severe Winter Storm	Low	Medium	Municipal Budget	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
12	Property and roadway flooding along Jacoby Road and Suter Road intersection - Mitigate street / private property flooding hazard to local traffic by replacing existing storm sewer pipes with larger pipes and drainage structures.	Property Protection, Structural Projects	Flood	Low	Medium	Municipal Budget	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
13	Property and roadway flooding along Jacoby Road at the Tumble Brook culvert - Mitigate street flooding by replacing the Tumble Brook	Property Protection, Structural Projects	Flood	Low	High	Municipal Budget	Township Engineering and Public Works, with support from	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*
	culvert beneath Jacoby Road.						the Pidcock Company		
14	Roadway flooding along Kozy Korner Road at the bridge over the Saucon Creek - Replace existing bridge to mitigate street flooding of Kozy Korner Road.	Property Protection, Structural Projects	Flood	Medium	High	FEMA mitigation grant funding; local budget for match	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
15	Roadway flooding along Lanark Road and Saucon Valley Road intersection - Mitigate major road flooding (to the point of road closure) by replacing the Lanark Road Bridge over the Saucon Creek and elevate the bridge road approaches.	Property Protection, Structural Projects	Flood	High	High	FEMA mitigation grant funding; State highways, local budget for match	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
16	Property flooding along Vera Cruz Road just north of Sescher Lane (private street) - Private property flooding to be mitigated by increasing current storm sewer size beneath Vera Cruz Road.	Property Protection, Structural Projects	Flood	Low	High	FEMA mitigation grant funding; State highways, local budget for match	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
17	Property and roadway flooding along West Hopewell Road - Mitigate street/private property flooding by installing a storm sewer system.	Property Protection, Structural Projects	Flood	Low	Medium	FEMA mitigation grant funding; local budget for match	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
18	Property and roadway flooding along the southern section of Whitetail Drive -	Property Protection, Structural	Flood	Low	Medium	Municipal Budget	Township Engineering and Public	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*
	Mitigate street/private property flooding by installing inlets and storm sewer pipes along Whitetail Drive.	Projects					Works, with support from the Pidcock Company		
19	Roadway flooding along Route 309 and Hopewell Road intersection - intersection floods during heavy rain events creating a traffic hazard and at times closure of south bound Route 309. Project will install larger drainage structure across Route 309 to mitigate major street flooding.	Property Protection, Structural Projects	Flood	High	High	FEMA mitigation grant funding; State highways, local budget for match	Township Engineering and Public Works, with support from the Pidcock Company	Long Term DOF	Existing
20	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: - 4664 Camp Meeting Road - 4537 East Valley Road - 4569 East Valley Road - 6301 N. Main Street  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	Property Protection	Flood	Medium-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*
	from FEMA and local match availability.								
21	<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. Specifically identified are the following:                      - 4664 Camp Meeting Road                      - 6301 N. Main Street</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	Medium-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
22	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.	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*
	Further, continue to meet and/or exceed the minimum NFIP standards and criteria through the following NFIP-related continued compliance actions identified below.								
23	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
24	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
25	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
26	Have designated NFIP Floodplain Administrator (FPA) become a Certified Floodplain Manager through	Public Education and Awareness	Flood	High	Low	Municipal Budget	NFIP Floodplain Administrator	Short Term	N/A



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*
	the ASFPM, and pursue relevant continuing education training such as FEMA Benefit-Cost Analysis.								
27	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
28	Archive elevation certificates	Public Education and Awareness	Flood	High	Low	Municipal Budget	NFIP Floodplain Administrator	On-going	NA
29	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
30	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
31	Create/enhance/ maintain	Emergency	All Hazards	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*
	mutual aid agreements with neighboring communities for continuity of operations.	Services				Budget	with support from Surrounding municipalities and County		Existing
32	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
33	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	Camp Meeting Road Bridge Widening	+	+	+	N	+	+	+	+	+	+	-	+	+	+	+	N	N	N	N	N	N	+	-	14 / 2 / 7	18 / 2 / 7
2	East Valley Road Flood Mitigation	N	N	+	N	-	-	+	-	-	+	N	N	-	-	N	N	+	N	+	N	N	+	-	6 / 6 / 9	6 / 8 / 11
3	Rt. 309 and Saucon Valley Road Drainage Improvement	+	+	+	N	+	+	+	+	+	+	-	+	+	+	+	N	N	N	N	N	N	+	-	14 / 2 / 7	18 / 2 / 7
4	Rt. 309 Saucon Valley Bridge Replacement and Elevation	+	+	+	N	+	+	+	+	+	+	N	+	+	N	+	+	N	N	+	N	+	N	N	15(+) 0(-) 8(N)	19(+) 0(-) 8(N)



SECTION 9.22: UPPER SAUCON TOWNSHIP

5	Glen Road Storm Sewer	-	-	-	N	-	+	-	-	-	+	N	N	-	-	N	N	+	N	+	N	N	+	-	5/10/8	5/12/10	
6	5151 West Hopewell Road Property Flooding	N	+	+	N	-	+	+	-	-	+	N	N	-	-	N	N	+	N	+	N	N	+	-	8/6/9	8/8/11	
7	Blue Church Road South Flood Mitigation	N	+	+	N	-	+	+	-	-	+	N	N	-	-	N	N	+	N	+	N	N	+	-	8/6/9	8/8/11	
8	Bowood Street Flood Mitigation	+	+	+	N	+	+	+	+	+	+	N	N	N	N	N	N	N	N	N	N	N	N	+	-		
9	Camp Meeting Road Flood Mitigation	+	+	+	N	+	+	+	+	+	+	-	+	+	+	N	N	N	N	N	N	N	N	+	-	14/2/7	18/2/7
10	Chestnut Drive, Orchard Drive, Apple Lane Flood Mitigation	-	-	-	N	-	+	-	-	-	+	N	N	-	-	N	N	+	N	+	N	N	+	-	5/10/8	5/12/10	
11	Black River Road Flood Mitigation	-	-	-	N	-	+	-	-	-	+	N	N	-	-	N	N	+	N	+	N	N	+	-	5/10/8	5/12/10	
12	Jacoby Road near Suter Road Flood Mitigation	-	-	-	N	-	+	-	-	-	+	N	N	-	-	N	N	+	N	+	N	N	+	-	5/10/8	5/12/10	
13	Jacoby Road and Tumble Brook Flood Mitigation	-	-	-	N	-	+	-	-	-	+	N	N	-	-	N	N	+	N	+	N	N	+	-	5/10/8	5/12/10	
14	Kozy Korner Bridge at Saucon Creek Flood Mitigation	-	-	-	N	-	+	-	-	-	+	N	N	-	-	N	N	+	N	+	N	N	+	-	5/10/8	5/12/10	
15	Lanark Road at Saucon Valley Road Flood Mitigation	+	+	+	N	+	+	+	+	+	+	-	+	+	+	N	N	N	N	N	N	N	+	-	14/2/7	18/2/7	
16	Vera Cruz Road Flood Mitigation	+	+	+	N	+	+	+	+	+	+	-	+	+	+	N	N	N	N	N	N	N	+	-	14/2/7	18/2/7	
17	West Hopewell Road Street/Property	+	+	+	N	+	+	+	+	+	+	-	+	+	+	N	N	N	N	N	N	N	+	-	14/2/7	18/2/7	





	Flood Mitigation																										
18	Whitetail Drive Flood Mitigation	N	+	+	N	-	+	+	-	-	+	N	N	-	-	N	N	+	N	+	N	N	+	-	8 / 6 / 9	8 / 8 / 11	
19	Rt. 309 at Hopewell Road Drainage	+	+	+	N	+	+	+	+	+	+	-	+	+	+	+	N	N	N	N	N	N	+	-	14 / 2 / 7	18 / 2 / 7	
20	Retrofit Vulnerable Properties	+	+	+	-	-	+	+	+	+	+	+	+	+	-	+	+	+	N	+	N	+	+	18 (+) 3 (-) 2 (N)	22 (+) 3 (-) 2 (N)		
21	Acquire Vulnerable Properties	+	+	+	-	-	-	+	-	+	+	+	+	+	-	+	+	+	+	+	N	+	+	17 (+) 5 (-) 1 (N)	21 (+) 5 (-) 1 (N)		
22	Maintain NFIP compliance	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	N	+	+	N	+	-	19 (+) 2 (-) 2 (N)	23 (+) 2 (-) 2 (N)		
23	Public Education and Outreach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	N	N	N	N	N	+	+	17 (+) 0 (-) 6 (N)	21 (+) 0 (-) 6 (N)		
24	Higher Regulatory Standards	+	+	-	+	+	-	-	-	+	+	+	+	+	+	+	N	N	+	+	+	+	-	16 (+) 5 (-) 2 (N)	20 (+) 5 (-) 2 (N)		
25	Community Assistance Visit	+	+	+	+	+	-	+	+	+	N	N	+	+	+	+	N	N	N	N	+	N	+	-	14 (+) 2 (-) 7 (N)	18 (+) 2 (-) 7 (N)	
26	NFIP FPA become a Certified Floodplain Manager	+	+	+	+	-	+	+	+	+	N	+	+	+	+	+	N	N	N	N	N	N	+	+	15 (+) 1 (-) 7 (N)	19 (+) 1 (-) 7 (N)	
27	Join Community Rating System	+	+	+	+	-	-	+	+	+	+	+	+	+	+	+	+	N	+	+	N	+	+	19 (+) 2 (-) 2 (N)	23 (+) 2 (-) 2 (N)		
28	Archive Elevation Certificates	+	+	+	+	+	+	+	+	+	N	+	+	+	N	+	N	N	N	N	+	N	+	+	16 (+) 0 (-) 7 (N)	22 (+) 0 (-) 7 (N)	



29	Support Plan Maintenance and Update	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	+	19 (+) 0 (-) 4 (N)	23 (+) 0 (-) 4 (N)
30	Update CEMP	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	N	+	N	+	+	+	+	20 (+) 0 (-) 3 (N)	24 (+) 0 (-) 3 (N)	
31	Enhance Mutual Aid Agreements	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	N	+	N	+	N	+	+	19 (+) 0 (-) 3 (N)	23 (+) 0 (-) 3 (N)		
32	Identify Post-Disaster Capabilities	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	N	N	N	+	N	+	+	18 (+) 1 (-) 4 (N)	22 (+) 4 (-) 4 (N)		
33	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 Saucon Township to illustrate the probable areas impacted within Upper Saucon 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 Saucon 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.

