



9.9 Township of Denville

This section presents the jurisdictional annex for the Township of Denville.

9.9.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan’s primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Wesley Sharples 1 St. Marys Place Denville, NJ (973) 627-4900 ext. 368 wsharples@denvillepolice.org	TBD

9.9.2 Municipal Profile

Denville Township is located in eastern Morris County. According to the U.S. Census, the Township has a total area of 12.64 square miles, of which 11.87 square miles is land and 0.77 square miles is water. It is bordered to the north by Rockaway Township, to the south by the Township of Parsippany-Troy Hills and Morris Township to the east by the Borough of Mountain Lakes and the Townships of Parsippany-Troy Hills and Boonton, and to the west by the Township and Borough of Rockaway and the Township of Randolph. The Rockaway River flows through the northern half of the Township. Other streams and creeks in the Township include Beaver Brook, Den Brook, Mount Tabor Brook, Watnong Brook, and North Branch Whippany River. Indian Lake, Holstein Lake, Arrowhead Lake, Cedar Lake, Cooks Pond, Rock Ridge Lake, and Cooper Lake are larger bodies of water located in the Township as well. Several unincorporated areas are located in the Township and include: Franklin and Union Hill. According to the U.S. Census, the 2010 population for the Township of Denville was 16,635.

Growth/Development Trends

The following table summarizes recent residential/commercial development since 2010 to present and any known or anticipated major residential/commercial development and major infrastructure development that has been identified in the next five years within the municipality. Refer to the map in section 9.9.9 of this annex which illustrates the hazard areas along with the location of potential new development.

Table 9.9-1. Growth and Development

Property or Development Name	Type (e.g., Res., Comm.)	# of Units/Structures	Location (address and/or Block & Lot)	Known Hazard Zone(s)	Description/Status of Development
Recent Development from 2010 to present					
None identified at this time					
Known or Anticipated Development in the Next Five Years					
None identified at this time					

* Only location-specific hazard zones or vulnerabilities identified.



9.9.3 Natural Hazard Event History Specific to the Municipality

Morris County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this plan. A summary of historical events is provided in each of the hazard profiles and includes a chronology of events that have affected the County and its municipalities. For the purpose of this plan update, events that have occurred in the County from 2008 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in the table below. For details of these and additional events, refer to Volume I, Section 5.0 of this plan.

Table 9.9-2. Hazard Event History

Dates of Event	Event Type	FEMA Declaration # (If Applicable)	County Designated?	Summary of Damages/Losses
March 12 – April 15, 2010	Severe Storms and Flooding	DR-1897	Yes	Involuntary residential evacuations occurred throughout the Township. Shelters were established but never used. An unknown number of facilities were closed due to power outages and road closures. Minor damage was sustained to facilities and structures in the Township. FEMA Project Worksheets were submitted for losses and reimbursement of overtime costs.
December 26-27, 2010	Severe Winter Storm and Snowstorm	DR-1954	Yes	An unknown number of roads were closed, utilities were out of service and businesses were closed following the storm. FEMA Project Worksheets were submitted for losses and reimbursement of overtime costs.
August 26 – September 5, 2011	Hurricane Irene	EM-3332 DR-4021	Yes Yes	Involuntary residential evacuations occurred throughout the Township. Shelters were established. An unknown number of facilities were closed due to power outages and road closures. The Township pump and sewer station were damaged by flood waters and power outages. General damage to facilities and structures was minor. Approximately one dozen private properties reported damage to the Township. FEMA Project Worksheets were submitted for losses and reimbursement of overtime costs.
October 29, 2011	Severe Storm	DR-4048	Yes	Involuntary residential evacuations occurred throughout the Township. Shelters were established. An unknown number of facilities were closed due to power outages and road closures. Multiple property owners reported damage due to fallen trees onto homes. FEMA Project Worksheets were submitted for losses and reimbursement of overtime costs.
October 26 – November 8, 2012	Hurricane Sandy	EM-3354 DR-4086	Yes Yes	Involuntary residential evacuations occurred throughout the Township. Shelters were established. An unknown number of facilities were closed due to power outages and road closures. FEMA Project Worksheets were submitted for losses and reimbursement of overtime costs.

9.9.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this plan have detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Township of Denville. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.



Hazard Risk/Vulnerability Risk Ranking

The table below summarizes the hazard risk/vulnerability rankings of potential hazards for the Township of Denville.

Table 9.9-3. Natural Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard ^{a, c}	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking ^b
Drought	Damage estimate not available	Frequent	27	Medium
Dam Failure	Damage estimate not available	Occasional	24	Medium
Earthquake	500-year MRP: \$3,181,873 2,500-year MRP: \$67,488,917	Occasional	28	Medium
Extreme Temperature	Damage estimate not available	Frequent	27	Medium
Flood	1% Annual Chance: \$51,047,162	Frequent	27	Medium
Geological Hazards	Exposed to Class A and Class B: \$27,938,455	Occasional	12	Low
Severe Storm	100-Year MRP: \$4,128,525 500-year MRP: \$21,999,780 Annualized: \$246,309	Frequent	48	High
Winter Storm	1% GBS: \$56,872,130 5% GBS: \$284,360,648	Frequent	54	High
Wildfire	Estimated Value Exposed to Extreme, Very High and High: \$3,199,576	Rare	6	Low

Notes:

- a. Building damage ratio estimates based on FEMA 386-2 (August 2001)
- b. The valuation of general building stock and loss estimates was based on custom inventory for the municipality.
High = Total hazard priority risk ranking score of 31 and above
Medium = Total hazard priority risk ranking of 20-30+
Low = Total hazard risk ranking below 20
- c. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the value of contents.
- d. Loss estimates for the flood and earthquake hazards represent both structure and contents.
- e. The HAZUS-MH earthquake model results are reported by Census Tract.

National Flood Insurance Program (NFIP) Summary

The following table summarizes the NFIP statistics for the Township of Denville.

Table 9.9-4. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Denville Township	403	713	\$17,804,481.16	47	23	303

Source: FEMA Region 2, 2014

- (1) Policies, claims, repetitive loss and severe repetitive loss statistics provided by FEMA Region 2, and are current as of 9/30/2014. Please note the total number of repetitive loss properties includes the severe repetitive loss properties. The number of claims represents claims closed by 9/30/14.
- (2) Total building and content losses from the claims file provided by FEMA Region 2.
- (3) The policies inside and outside of the flood zones is based on the latitude and longitude provided by FEMA Region 2 in the policy file.

Notes: FEMA noted that where there is more than one entry for a property, there may be more than one policy in force or more than one GIS possibility.





A zero percentage denotes less than 1/100th percentage and not zero damages or vulnerability as may be the case.
 Number of policies and claims and claims total exclude properties located outside County boundary, based on provided latitude and longitude.

Critical Facilities

The table below presents HAZUS-MH estimates of the damage and loss of use to critical facilities in the community as a result of a 1-and 0.2-percent annual chance flood events.

Table 9.9-5. Potential Flood Losses to Critical Facilities

Name	Type	Exposure		Potential Loss from 1% Flood Event		
		1% Event	0.2% Event	Percent Structure Damage	Percent Content Damage	Days to 100-Percent ⁽¹⁾
Indian Lake Dam	Dam	X	X	-	-	-
St. Mary's Catholic Church	School		X	-	-	-
Sulky Transport Inc	Bus Facility	X	X	-	-	-
Denville Fire & Rescue Dept (Valley View Co. 3)	Fire	X	X	-	-	-

Source: HAZUS-MH 2.1

Note (1): HAZUS-MH 2.1 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore this will be an indication of the maximum downtime (HAZUS-MH 2.1 User Manual).

Note (2): In some cases, a facility may be located in the DFIRM flood hazard boundary; however HAZUS did not calculate potential loss. This may be because the depth of flooding does not amount to any damages to the structure according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility that is outside the DFIRM because the model generated a depth grid beyond the DFIRM boundaries.

NA Not available

X Facility located within the DFIRM boundary

- Not calculated by HAZUS-MH 2.1

Other Vulnerabilities Identified

According to the 2015 preliminary FEMA Flood Insurance Study (FIS), the history of flooding in the Township of Denville indicates that flooding usually occurs during the summer and fall months and usually associated with thunderstorms and hurricanes. Flooding along the Rockaway River occurs throughout the entire length of the River within the Township. The greatest amount of damage occurs in the general area alongside Riverside Drive and the riverfront properties in the vicinity of the Diamond Spring Road Bridge. Damage from flooding along Beaver Brook is relatively light as a result of flood waters being limited to the largely undeveloped low-lying areas along the stream. Flooding from Den Brook usually occurs along the shorelines of Lake Estling and Indian Lake. Further downstream, the areas of Peck Meadow Brook and Woodland Avenue are impacted by flooding. The combined effect of flooding on Den Brook and the Rockaway River have inundated both U.S. Route 46 and Denville Center (FEMA FIS 2015).

9.9.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- National Flood Insurance Program



- Integration of Mitigation Planning into Existing and Future Planning Mechanisms

Planning and Regulatory Capability

The table below summarizes the regulatory tools that are available to the Township of Denville.

Table 9.9-6. Planning and Regulatory Tools

Tool/Program (code, ordinance, plan)	Do you have this? (Yes/No)	Authority (local, county, state, federal)	Dept./Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	Yes	Local	Planning & Zoning Boards	Master Plan 2000 Master Plan Re-Examination Plan 2006; Chapter XIX (Land Use) Article 6 of Township code
Capital Improvements Plan	Yes	Local	Planning Board	Annual, Bond Ordinance for capital improvements #19-15
Floodplain Management/ Basin Plan	No			
Stormwater Management Plan	No			
Open Space Plan	Yes	Local	Engineering/Administration	Part of Master Plan Re-Examination 2006
Stream Corridor Management Plan	No			
Watershed Management or Protection Plan	No			
Economic Development Plan	No			
Comprehensive Emergency Management Plan	Yes	Local	OEM	Emergency Operations Plan 2011
Emergency Response Plan	Yes	Local	OEM	As part of EOP 2011
Post-Disaster Recovery Plan	Yes	Local	OEM	As part of EOP 2011
Transportation Plan	Yes	Local	OEM	As part of EOP 2011
Strategic Recovery Planning Report	No			
Other Plans:	No			
Regulatory Capability				
Building Code	Yes	State & Local	Building Code Official	State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.)
Zoning Ordinance	Yes	Local	Planning & Zoning Boards	Chapter XX of Township Code
Subdivision Ordinance	Yes	Local	Planning & Zoning Boards	Chapter XIX (Land Use) Article 4 of Township Code
NFIP Flood Damage Prevention Ordinance	Yes	Federal, State, Local	John Ruschke, PE, CFM	Chapter XIX (Land Use) Article 5
NFIP: Cumulative Substantial Damages	No			
NFIP: Freeboard	Yes	State, Local	John Ruschke, PE, CFM	Enforce State NJ DEP Requirements
Growth Management Ordinances	No			
Site Plan Review	Yes	Local	Planning and Zoning	Chapter XIX (Land Use) Article 4



Tool/Program (code, ordinance, plan)	Do you have this? (Yes/No)	Authority (local, county, state, federal)	Dept./Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Requirements				
Stormwater Management Ordinance	Yes	Local	Planning and Zoning Boards	Chapter XIX (Land Use) Article 4 of Township Code (19-4.16 STORMWATER CONTROL)
Municipal Separate Storm Sewer System (MS4)	No			
Natural Hazard Ordinance	No			
Post-Disaster Recovery Ordinance	No			
Real Estate Disclosure Requirement	No	State	Division of Consumer Affairs	N.J.A.C. 13:45A-29.1
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Yes	Local	Engineering	Flood Risk Reduction Program, Alternative Action Plan April 2014

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Denville.

Table 9.9-7. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Township Planning Board
Mitigation Planning Committee	Yes	HMP Update Planning Committee
Environmental Board/Commission	Yes	Township Environmental Commission; Green Team/Sustainable NJ
Open Space Board/Committee	Yes	Open Space Committee
Economic Development Commission/Committee	No	
Maintenance Programs to Reduce Risk	Yes	Department of Public Works
Mutual Aid Agreements	Yes	Neighboring Communities
Technical/Staffing Capability		
Planner(s) or Engineer(s) with knowledge of land development and land management practices	Yes	Township Engineer
Engineer(s) or Professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	
Planners or engineers with an understanding of natural hazards	Yes	
NFIP Floodplain Administrator	Yes	John Ruschke, PE, CFM
Surveyor(s)	No	
Personnel skilled or trained in GIS and/or HAZUS-MH applications	Yes	
Scientist familiar with natural hazards	No	
Emergency Manager	Yes	
Grant Writer(s)	Yes	
Staff with expertise or training in benefit/cost analysis	Yes	
Professionals trained in conducting damage assessments	Yes	





Fiscal Capability

The table below summarizes financial resources available to the Township of Denville.

Table 9.9-8. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No/Don't Know)
Community Development Block Grants (CDBG, CDBG-DR)	Don't Know
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for specific purposes	Don't Know
User fees for water, sewer, gas, or electric service	Yes
Impact Fees for homebuyers or developers of new development/homes	Don't Know
Stormwater Utility Fee	Yes
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	Yes
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No
Other Federal or State Funding Programs	Yes
Open Space Acquisition Funding Programs	Yes-Morris County Flood Mitigation Program (acquisitions)
Other	

Community Classifications

The table below summarizes classifications for community program available to the Township of Denville.

Table 9.9-9. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	Yes	9	
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	TBD	TBD
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes	TBD	TBD
Storm Ready	No		
Firewise	No		
Disaster/Safety Programs in/for Schools	Yes		
Organizations with Mitigation Focus (advocacy group, non-government)	TBD		
Public Education Program/Outreach (through website, social media)	Yes		
Public-Private Partnerships	TBD		

N/A = Not applicable. NP = Not participating. - = Unavailable. TBD = To be determined.

The classifications listed above relate to the community's ability to provide effective services to lessen its vulnerability to the 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 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.

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/>

Self-Assessment of Capability

The table below provides an approximate measure of Denville’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

Table 9.9-10. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability			X
Administrative and Technical Capability			X
Fiscal Capability		X	
Community Political Capability			X
Community Resiliency Capability		X	
Capability to Integrate Mitigation into Municipal Processes and Activities.		X	

National Flood Insurance Program

NFIP Floodplain Administrator

John Ruschke, PE, CFM

Flood Vulnerability Summary

Township of Denville joined the NFIP on June 25, 1971, and is currently an active member of the NFIP. The current effective Flood Insurance Rate Maps are dated April 17, 1985. As of September 30, 2014 there are 403 policies in force. Since September 30, 2014, 713 claims have been paid totaling \$17,804,481.16. As of September 30, 2014 there are 47 Repetitive Loss and 23 Severe Repetitive Loss properties in the community.

The Township maintains a list of properties that have been flood damaged. A list is also maintained detailing all FEMA claims made by property owners. There are limited records and inventories kept regarding a property owner’s interest in mitigation projects.

The impact of Hurricane Sandy was relatively minor on the Township. Hurricane Irene in 2011 caused significant damage to structures. Following Hurricane Irene approximately 10 Substantial Damage estimates were made. Inquiries have been made by property owners regarding the procedures required to obtain





mitigation project money. The primary sources of funding for mitigation projects are private funds from the property owners and flood insurance. Only two homes received ICC funding.

Resources

John Ruschke, PE, CFM is currently the Township's NFIP Floodplain Administrator which is an auxiliary duty. The role of NFIP Floodplain Administrator is a shared role among the Township Engineer, Township Code Official, and the Land Use Department. Duties and responsibilities of the NFIP Administrator are permit review, inspections, damage assessments, record-keeping, GIS, and education and outreach.

John Ruschke, PE, CFM feels he is adequately supported and trained to fulfill his responsibilities as the municipal floodplain administrator. At this time no barriers to running an effective floodplain management program have been identified. John Ruschke, PE, CFM is a certified in floodplain management and attends regular continuing education programs for code enforcement.

The Township abides by the required protocol set forth by the Community Rating System (CRS) program in which it is an active member.

In the Township of Denville, annual newsletters are distributed discussing flood hazards/risk and flood risk reduction. At all times flood hazard information is available on the Township website.

Compliance History

The community is currently in good standing in the NFIP and has no outstanding compliance issues. Township of Denville has completed Community Assistance Visits (CAV), with the most recent visit completed in 2011 following Hurricane Irene.

Regulatory

Floodplain management regulations and ordinances exceed the minimum requirements set forth by both FEMA and the State of New Jersey. Additional local regulations and ordinances support the implementation of the floodplain management program in the Township.

The Township of Denville is in good standing in the Community Rating System (CRS) program. Currently, they have a Class 9 Rating. The Township is working towards receiving a Class 8 Rating through its next re-verification visit.

Community Rating System

The Township of Denville does participate in the Community Rating System (CRS) program.

Other Capabilities Identified

Previous actions that are now on-going programs and capabilities are described below. Refer to Table 9.9-11 presented later in this annex.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.



Planning

The Township of Denville participates in the County's Flood Mitigation Program (FMP) and a Flood Acquisition Plan (FLAP) is currently in progress for the community. The Morris County FMP is the first dedicated, county-level flood acquisition program in the State of New Jersey. The FMP allows Morris County to assist municipalities in moving people out of harm's way, lowering municipal costs due to intense flooding episodes, and create natural flood capture and storage areas which protect the remaining homes and businesses. The FMP is funded by the Morris County Open Space tax and provides grant monies for municipalities to purchase flood-prone residential properties. In addition to MATCH funding available for projects with state or federal monies, Morris County has CORE funding in which the County takes the lead grant role, providing up to 75% of the cost of acquisition. To access this CORE funding, a municipality must have a FLAP. The FLAP is a dynamic, essential tool for understanding the unique flood hazards to residential homes within each community. Working closely with the municipality, Morris County creates this detailed, comprehensive analysis of the historic and current flood risks free of charge. A wide array of data is utilized from sources such as: FEMA, National Flood Insurance Program, USACE Flood Studies, USGS stream gage data, and topography and soil analysis. All land acquired with MATCH and CORE funding within the FMP is permanently deed-restricted, preserved open space, available for public use as an active or passive recreation area. The acquired land is municipal-owned and managed in perpetuity.

Regulatory and Enforcement

The Borough continues to update and amend its local code as seen fit.

Education and Outreach

In conjunction with the County, the Borough is in the beginning stages of developing a public education and outreach program. The purpose of the program is to inform and disseminate information to the public regarding hazard mitigation and preparedness.

9.9.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

The following table indicates progress on the community's mitigation strategy identified in the 2010 Plan. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and may also be found under 'Capability Assessment' presented previously in this annex.

Table 9.9-11. Past Mitigation Initiative Status

Description	Status	Review Comments
Denville Twp 1: Backup power (generator) for Municipal Building	50% Complete Project has been designed and is ready for bid. Construction phase in late 2015.	This initiative will be carried forward into the updated mitigation strategy.
Denville Twp 2: Building code update	In progress-50% Complete	This initiative will be carried forward into the updated mitigation strategy.
Denville Twp 3: Retention Basin Improvement for Den Brook #1	Discontinue	Deemed not an effective measure; therefore, this initiative will not be included in the 2015





Description	Status	Review Comments
		HMP Update.
Denville Twp 4: Retention Basin Improvement for Den Brook #2	Discontinue	Deemed not an effective measure; therefore, this initiative will not be included in the 2015 HMP Update.
Denville Twp 5: Retention Basin Improvement for Den Brook #3	Discontinue	Deemed not an effective measure; therefore, this initiative will not be included in the 2015 HMP Update.
Denville Twp 6: Feasibility study to install check valves storm water runoff system.	Discontinue	Deemed not an effective measure; therefore, this initiative will not be included in the 2015 HMP Update.
Denville Twp 7: Construct Den Brook protection berm.	Discontinue	Significant environmental impacts
Denville Twp 8: Risk assessment and analysis of Lake Estling Dam.	Discontinue	Deemed not an effective measure; therefore, this initiative will not be included in the 2015 HMP Update.
Denville Twp 9: Remove silt of three areas on Rockaway River.	Discontinue	Deemed not an effective measure; therefore, this initiative will not be included in the 2015 HMP Update.
Denville Twp 10: Acquisition/elevation of nine severe repetitive loss properties on Riverside Drive, Snyder Avenue, and Woodland Avenue	Discontinue	This initiative has been updated and will be carried forward into the updated mitigation strategy.
Denville Twp 11: Acquisition/elevation of six repetitive loss properties on Hinchman Drive.	Discontinue	This initiative has been updated and will be carried forward into the updated mitigation strategy.
Denville Twp 12: Acquisition/elevation of 29 repetitive loss properties on Riverside Drive.	Discontinue	This initiative has been updated and will be carried forward into the updated mitigation strategy.
Denville Twp 13: Acquisition/elevation of five repetitive loss properties on Snyder Avenue.	Discontinue	This initiative has been updated and will be carried forward into the updated mitigation strategy.
Denville Twp 14: Develop all-hazards public education and outreach program for hazard mitigation and preparedness.	Continuous	The Township and County are working together to establish a program. This initiative will be incorporated as an integration action item and will not be carried forward into the updated mitigation strategy.

Completed Mitigation Initiatives not Identified in the Previous Mitigation Strategy

The municipality has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2010 Plan:

- Removal of the western and eastern Morris Canal Aqueduct Piers that are located in the Rockaway River is to take place in the summer of 2015.
- As part of the NJDEP Passaic River Basin Stream Cleaning Grant, de-silting two target areas of the Rockaway River where sediment had built up over time and obstructed flow.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Denville participated in a mitigation action workshop in January 2015 and was provided the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).





Table 9.9-12 summarizes the comprehensive-range of specific mitigation initiatives the Township of Denville would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. These initiatives 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. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6, fourteen evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High,’ ‘Medium,’ or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.9-13 provides a summary of the prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.9-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
DEN-1 (former)	Backup power (generator) for Municipal Building	Existing	All Hazards	G-3	Engineering Department/Mayor	Reduced vulnerability of critical facility and services to power outages	\$200,000	HMGP 5% Initiative	As soon as hazard mitigation plan is adopted	High	SIP	PP
DEN-2 (former)	Denville Township Building Code Update: Update Denville Township Building Code to reduce flood risks.	New	Seismic and Wind	G-3, G-4	Municipal Code Enforcement	Improved regulatory and enforcement capabilities to manage flood risk	Staff Time	Denville Township	3 Years	Medium	LPR	PR
DEN-3	Bloomfield Avenue Area Pump Station : To address flooding of the parking lots between Bloomfield Avenue and Route 46 and adjacent areas, the following actions are recommended: <ul style="list-style-type: none"> • Provide a pump station near the storm sewer system discharge at Route 46. • Provide a tide gate at the storm sewer outlet at Route 46. • Separate the First Avenue storm sewer system from that serving Second Avenue (to prevent having Second Avenue stormwater back up in the First Avenue system). • Evaluate the need for tide gates at the storm sewer outlets for Second and Third Avenues at the Rockaway River. 											
	See above.	Existing	Local Flooding	G-4	Township Administrator/Township Engineer	Physical property damage, Road Closing/Detours	\$2,000,000	Denville Township, USEPA	3-5 Years	High	SIP	PP
DEN-4	Evaluation of Bridges and Other River Structures: Based upon the review of conditions along the Rockaway River from the Boonton Reservoir to and through the Township of Denville, only minimal benefits may be achieved in Denville through modification of the Powerville Dam and the bridge structures along the river. However, the benefits of modifying the bridges when they are scheduled for replacement due to structural problems or other issues should not be ignored. A comprehensive master plan should be developed for appropriate sizing of the bridge openings and setting road elevations to provide maximum benefits as the bridges are eventually replaced over time. This master plan for this reach of the Rockaway River should be developed in coordination with Morris County and assistance from the USACE as may be available (see below). The following concepts and actions are recommended for further consideration and evaluation as part of the development of a long range program: <ul style="list-style-type: none"> • Modification of the Powerville Dam to reduce upstream backwater effects • Modification or replacement of the following structures: <ul style="list-style-type: none"> ○ Bush Road Bridge – for emergency access purposes ○ Pocono Road Bridge ○ Diamond Spring Road Bridge ○ Savage Road Bridge (not recommended for replacement) • The evaluation of the bridge modifications and replacements should include consideration of: hydraulic losses and potential benefits, individually and in combination; potential upstream effects during greater than the design storm that may be associated with raising the elevation of the bridges and approach roads; emergency access restrictions and needs under existing and proposed conditions. 											



Table 9.9-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	See above.	Existing and New	Local Flooding/Dam Failure	G-2, G-4	Township Administrator/Township Engineer	Loss of Function, Road Closures	Staff Time	Denville Township	1-3 Years	Medium	LPR SIP	PR, PP
DEN-5	<p>25 & 50-Year Level Protection Implementations: Consideration should be given to the concept of implementing segments (e.g., levee, pump station) of the considered improvements to provide a 25-year or 50-year level of protection where the benefits are reasonable in view of the associated costs. See Action Worksheet.</p>											
	See above.	Existing and New	Severe Weather	G-2, G-4	Township Administrator/Township Engineer	Loss of Function, Road closures/detours	\$7,000,000	Denville Township/NDEP/USE PA	3-5 Years	High	SIP	PP
DEN-6	<p>Acquisition of Properties: The Township is already effectively utilizing the acquisition alternative to reduce the potential for future flood damage risk. This practice should continue where appropriate. The remaining 53 identified repetitive loss properties should be evaluated and prioritized for acquisition or other appropriate action (e.g., flood proofing, elevation). Concept plans should be developed for preservation of acquired property including preservation of floodplains, excavation or regrading to provide increased flood storage volume, possible alignment of floodwalls or berms along the river, etc. For structures which will remain in the floodplain, consideration should be given to implementing flood proofing measures (both wet and dry methods as applicable). Reference should be made to FEMA literature and technical guidance, which should be made readily available to the public through links on the Township web page and copies made available in the Township library.</p>											
	See above.	Existing	Local Flooding	G-1, G-3, G-4	Township Administrator/Township Engineer	Removal of structures from flood risk	\$1,500,000	FEMA	1-3 Years	Medium	EA P, SIP	PI, PP
DEN-7	<p>Elevation of Properties: The elevation of repetitive loss properties is another alternative to reduce the potential for future flood damage risk. The 53 identified repetitive loss properties should be evaluated and prioritized for elevation. Concept plans should be developed for preservation of acquired property including preservation of floodplains, excavation or regrading to provide increased flood storage volume, possible alignment of floodwalls or berms along the river, etc.</p>											
	See above.	Existing	Local Flooding	G-1, G-3, G-4	Township Administrator/Township Engineer	Reduction of structures from flood risk	\$500,000	FEMA	3-5 Years	Medium	EA P, SIP	PI, PP
DEN-8	<p>Flood Warning System: The flood warning system resources available to the Township should be reviewed and utilized. FEMA, USGS and other agencies are continuing to provide additional resources, such as on line digital flood maps, weather alerts and flood depth mapping. While these specific resources are not currently available to the Township, it is anticipated that they will become available within a few years. Periodic communications with FEMA, the NJDEP and other agencies may provide information regarding the expected implementation of these resources for the Township.</p>											
	See above.	Existing and	Severe	G-1, G-2	Township	Improved local	\$30,000	HMGP/Den	1 Year	High	EA	PI





Table 9.9-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
		New	Weather		Administrator/Township Engineer	awareness, preparedness and response capabilities to flood events		ville Township			P	
	Review & update the Denville Township Flood Hazard Area Ordinance: Review and update the Denville Township Flood Hazard Area Ordinance. It should be consistent with FEMA requirements. Also, updating will be required when FEMA issues the new digital mapping to replace the prior paper maps											
DEN-9	See above.	Existing	Local Flooding	G-3	Township Administrator/Township Engineer	Improved regulatory and enforcement capabilities to manage flood risk	Staff Time	Denville Township	1 Year	High	LPR	PR
	Stream Cleaning & Maintenance: Continue to promote stream cleaning efforts for the removal of debris and targeted areas of sediment/silt buildup. Bridge openings must be maintained. Removal of debris from the channel helps reduce the risk of bridge openings becoming obstructed during a storm. For the same reason, fallen tree trunks and large branches should be removed from the floodplain adjacent to the river channel. Overbank flooding could carry these materials into the river and result in obstructions at bridges. Remove in-channel obstructions to flow, particularly any structures that may catch debris and obstruct free flow of the river. This would include the remaining piers at the former Morris Canal crossing of the river. While the piers introduce little hydraulic loss if kept free of debris, they present a hazard in the river when debris accumulates and reduces the hydraulic capacity at that location.											
DEN-10	See above.	Existing	Local Flooding	G-4	Township Administrator/Township Engineer	Physical property, road closures	\$100,000	Denville Township/NJDEP	1-3 Years	High	NSP	NR
DEN-11	Cooks Pond Dam: Develop and install overtopping protection for this class II dam which has the potential for significant hazard if failure or breach were to occur	Existing	Dam Failure	G-4	Township Administrator/Township Engineer	Physical Property damage, loss of function, Road closings/detours	\$250,000	Denville Township	1-3 Years	High	SIP	PP
DEN-12	Flood Mitigation Report: Perform a study of all current, past, and future flood mitigation actions. A 2014 FEMA grant application was submitted by Denville Township to receive funding for this study.	Existing	Local Flooding	G-1, G-2, G-3, G-4	Township Administrator/Township Engineer	Planning for more efficient mitigation measures	\$25,000	HMGP	1 Year	High	LPR EA P	PR, PI
DEN-13	DPW Generator: Provide a backup power source (generator) for the Denville Township department of	New	All Hazards	G-3	Township Administrator/Township Engineer	Reduced vulnerability of critical facility and services to	\$300,000	Denville Township/HMGP	1-3 Years	High	SIP	PP





Table 9.9-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	public works facility.					power outages						
DEN-14	Sanitary Sewer Reinforcement: Perform a study to determine where sanitary sewer reinforcement is needed due to most imminent threats of failure or cracking.	Existing	Severe Weather	G-2, G-3	Township Administrator/Township Engineer	Reduced vulnerability of critical infrastructure, road closings/detours	\$50,000	Denville/HMGP	1-3 Years	Medium	EA P, SIP	PR, PP
DEN-15	Valley View Fire House Generator: Provide a backup power source (generator) for the Valley View Fire House.	New	All Hazards	G-3	Township Administrator/Township Engineer	Reduced vulnerability of critical facility and services to power outages, life safety.	\$75,000	Denville Township/HMGP	Immediate	High	SIP	PP
DEN-16	Develop All Hazards Public Education & Outreach program for Hazard Mitigation & Preparedness: Continue Denville Township public education and outreach programs and preparedness.	Existing	All Hazards	G-1, G-2	OEM Coordinator in Cooperation with MCOEM	Improved public understanding of risks and personal preparedness and mitigation	\$15,000	Denville Township/HMGP	1 Year	High	EA P	PR
DEN-17	Tree Removal and Maintenance in the Vicinity of Power Lines: Tree removal and maintenance in the vicinity of power lines will help minimize power outages during severe storm events.	Existing	Severe Weather	G-2, G-4	Township Administrator/Township Engineer	Loss of Function, Road closures/detours	\$30,000	Denville Township/HMGP	1 Year	High	SIP	PP
DEN-18	Catch Basin & General Stormwater Facility Maintenance: The continual maintenance of catch basins and stormwater facilities is critical especially before and after large storm events.	Existing	Severe Weather	G-2, G-4	Township Administrator/Township Engineer	Loss of Function	\$15,000	Denville Township/HMGP	1 Year	High	SIP	PP

Notes:

Not all acronyms and abbreviations defined below are included in the table.

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





Acronyms and Abbreviations:

CAV	Community Assistance Visit
CRS	Community Rating System
DPW	Department of Public Works
FEMA	Federal Emergency Management Agency
FPA	Floodplain Administrator
HMA	Hazard Mitigation Assistance
N/A	Not applicable
NFIP	National Flood Insurance Program
NJDEP	New Jersey Department of Environmental Protection
NJOEM	New Jersey Office of Emergency Management
OEM	Office of Emergency Management

Potential FEMA HMA Funding Sources:

FMA	Flood Mitigation Assistance Grant Program
HMGP	Hazard Mitigation Grant Program
PDM	Pre-Disaster Mitigation Grant Program
RFC	Repetitive Flood Claims Grant Program
SRL	Severe Repetitive Loss Grant Program

Timeline:

Short	1 to 5 years
Long Term	5 years or greater
OG	On-going program
DOF	Depending on funding

Costs:

Where actual project costs have been reasonably estimated:

Low	< \$10,000
Medium	\$10,000 to \$100,000
High	> \$100,000

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

Low	Possible to fund under existing budget. Project is part of, or can be part of an existing on-going program.
Medium	Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
High	Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover the costs of the proposed project.

Benefits:

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

Low=	< \$10,000
Medium	\$10,000 to \$100,000
High	> \$100,000

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

Low	Long-term benefits of the project are difficult to quantify in the short term.
Medium	Project will have a long-term impact on the reduction of risk exposure to life and property, or project will provide an immediate reduction in the risk exposure to property.
High	Project will have an immediate impact on the reduction of risk exposure to life and property.

Mitigation Category:

- Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.
- Structure and Infrastructure Project (SIP)-These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- Natural Systems Protection (NSP) – These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- Preventative Measures (PR)-Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.
- Property Protection (PP)-These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.





- *Public Information (PI)-Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR)-Actions that minimize hazard loss and also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP)-Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES)-Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities*



Table 9.9-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High/Medium/Low
DEN-1	Backup power (generator) for Municipal Building	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	High
DEN-2	Denville Township Building Code Update	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Medium
DEN-3	Bloomfield Avenue Area Pump Station	0	1	1	1	1	1	-1	0	1	1	-1	1	1	1	8	High
DEN-4	Evaluation of Bridges and Other River Structures	0	1	0	1	1	1	-1	0	1	1	0	0	1	1	7	Medium
DEN-5	25 & 50-Year Level Protection Implementations	1	1	-1	0	1	1	-1	0	1	1	1	-1	1	1	6	High
DEN-6	Acquisition of Properties	1	1	1	0	0	0	0	1	1	1	1	0	1	0	8	Medium
DEN-7	Elevation of Properties	1	1	1	0	0	0	0	1	1	1	1	0	1	0	8	Medium
DEN-8	Flood Warning System	1	1	1	0	0	0	0	1	1	1	1	0	1	0	8	High
DEN-9	Review & update the Denville Township Flood Hazard Area Ordinance	1	1	1	0	0	0	0	1	1	1	1	0	1	0	8	High
DEN-10	Stream Cleaning & Maintenance	0	1	1	1	1	1	-1	0	1	1	1	1	1	0	9	High
DEN-11	Cooks Pond Dam	0	1	1	1	1	1	-1	0	1	1	0	1	1	1	9	High
DEN-12	Flood Mitigation Report	1	1	1	1	0	0	0	1	1	1	1	1	0	0	9	High
DEN-13	DPW Generator	1	1	1	1	0	0	0	0	1	1	1	1	0	0	8	High
DEN-14	Sanitary Sewer Reinforcement	0	1	1	1	1	1	-1	1	1	1	1	1	1	1	12	High
DEN-15	Valley View Fire House Generator	1	1	1	1	0	0	0	0	1	1	1	1	0	0	8	High
DEN-16	Develop All Hazards Public Education & Outreach program for Hazard Mitigation & Preparedness	1	1	1	0	0	0	0	1	1	1	1	0	1	0	8	High
DEN-17	Tree Removal and Maintenance in the Vicinity of Power Lines	0	1	1	1	1	1	1	-1	0	1	1	1	1	1	10	High





Table 9.9-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High/Medium/Low
DEN-18	Catch Basin & General Stormwater Facility Maintenance	0	1	1	1	1	1	1	1	0	1	1	1	1	1	12	High

Note: Refer to Section 6 which contains the guidance on conducting the prioritization of mitigation actions.



9.9.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.9.8 Hazard Area Extent and Location

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

9.9.9 Additional Comments

None at this time.



Figure 9.9-1. Township of Denville Hazard Area Extent and Location Map 1

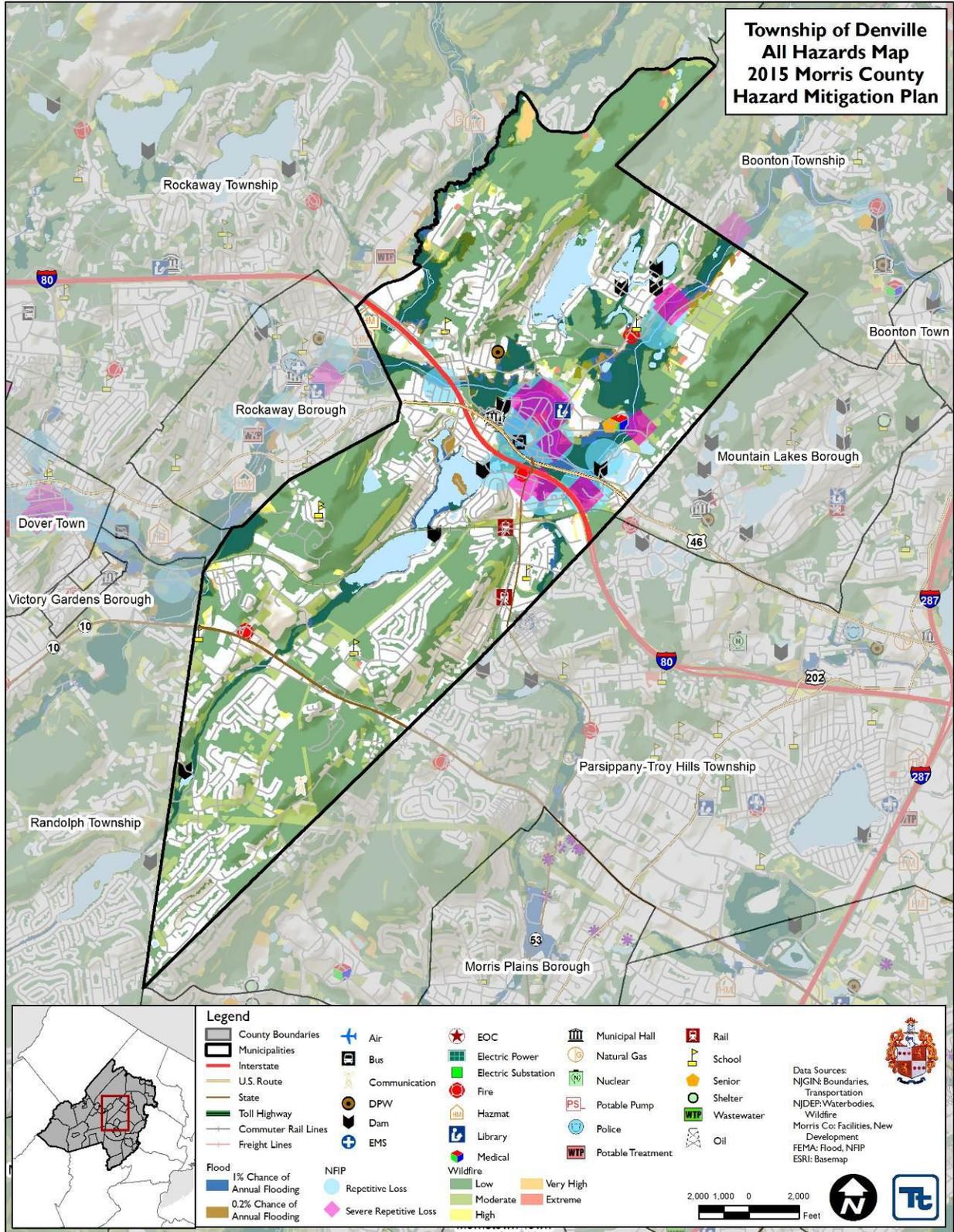
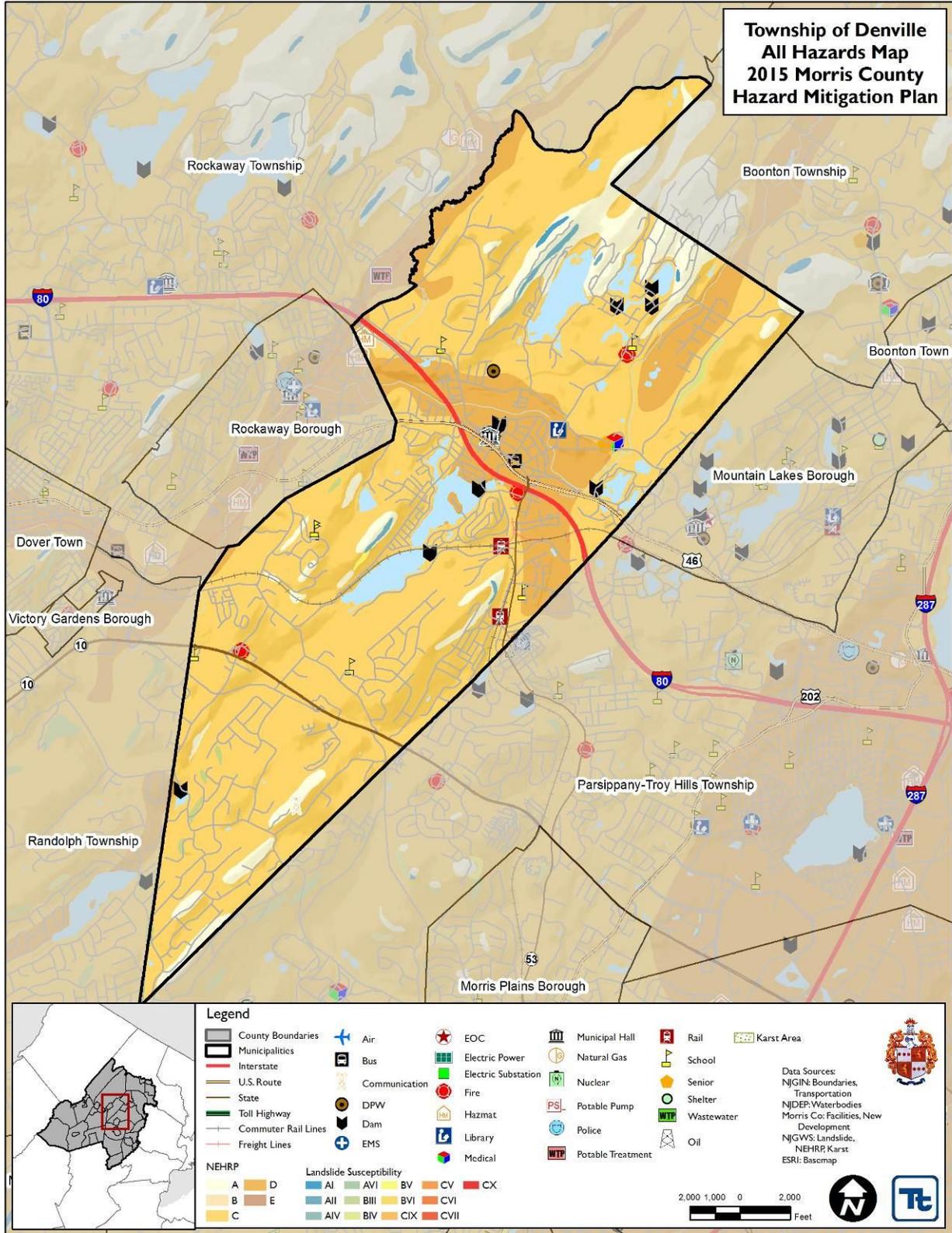




Figure 9.9-2. Township of Denville Hazard Area Extent and Location Map 2





Name of Jurisdiction: Denville Township
Action Number: DEN-3
Mitigation Action/Initiative: Bloomfield Avenue Area Improvements & Pump Station

Assessing the Risk	
Hazard(s) addressed:	Flood, Severe Storm
Specific problem being mitigated:	Address local flooding from the Rockaway River
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Address flooding issues of parking lots in Township 2. Do nothing – current problem continues 3. No other feasible options were identified
Action/Project Intended for Implementation	
Description of Selected Action/Project	To address flooding of the parking lots between Bloomfield Avenue and Route 46 (and adjacent areas) 4 actions are recommended: <ol style="list-style-type: none"> 1. Provide a pump station near the storm sewer discharge at route 46 2. Provide a tide gate at the storm sewer outlet at Route 46 3. Separate the First Ave. storm sewer system from that serving the Second Avenue 4. Evaluate the need for tide gates at the storm sewer outlets for Second and Third Avenues at the Rockaway River
Action/Project Category	Structural and Infrastructure Project (SIP)
Goals/Objectives Met	G-4
Applies to existing, future, or not applicable	Future
Benefits (losses avoided)	Physical property damage, Road Closing/Detours
Estimated Cost	\$2,000,000 (High)
Priority*	High
Plan for Implementation	
Responsible Organization	Twp. Engineer
Local Planning Mechanism	Floodplain Management
Potential Funding Sources	Denville Township, USEPA
Timeline for Completion	Short Term (3-5 years)
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: January 2015 Progress on Action/Project: Continuing

* Refer to results of Prioritization (page 2)



Action Number: DEN-3
Mitigation Action/Initiative: Bloomfield Avenue Area Improvements & Pump Station

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	No loss of life threat currently exists
Property Protection	1	Will significantly reduce damage to Bloomfield Ave area
Cost-Effectiveness	1	High costs associated with high level benefits
Technical	1	Pump station & tide gates are technically feasible
Political	1	Political and overall public support for the project implementation
Legal	1	Legally Feasible
Fiscal	-1	New authorization or funding from another source is needed
Environmental	0	Will require standard land use permits from NJDEP
Social	1	Project will have positive impacts on population in Bloomfield Ave area
Administrative	1	Denville has the capabilities to implement and maintain the project
Multi-Hazard	-1	Flood hazard only
Timeline	1	Project goal is 3-5 years (Secure funding, design and construct)
Agency Champion	1	Advocated for by the governing body
Other Community Objectives	1	Addresses flood mitigation & capital improvements
Total	8	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Denville Township
 Action Number: DEN-4
 Mitigation Action/Initiative: Evaluation of Bridges & Other Structures

Assessing the Risk	
Hazard(s) addressed:	Dam failure, Flooding
Specific problem being mitigated:	Modification or replacement of structures
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Modify or replace four bridges in the Township
	2. Do nothing – current problem continues
	3. No other feasible options were identified
Action/Project Intended for Implementation	
Description of Selected Action/Project	<p>Evaluation and possible replacement of:</p> <ul style="list-style-type: none"> • Bush Road Bridge • Pocono Road Bridge • Diamond Spring Road Bridge • Savage Road Bridge <p>The evaluation of the bridge modifications and replacements should include consideration of: hydraulic losses and potential benefits, individually and in combination; potential upstream effects during greater than the design storm that may be associated with raising the elevation of the bridges and approach roads; emergency access restrictions and needs under existing and proposed conditions.</p>
Action/Project Category	Structure and Infrastructure (SIP); LPR
Goals/Objectives Met	G-2, G-4
Applies to existing, future, or not applicable	Existing Bridges
Benefits (losses avoided)	Loss of Function, Road Closures
Estimated Cost	Staff Time (Low)
Priority*	Medium
Plan for Implementation	
Responsible Organization	Engineering
Local Planning Mechanism	Emergency Management
Potential Funding Sources	Denville Township
Timeline for Completion	Short term, 1-3 years
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: January 2015 Progress on Action/Project: Continuing

* Refer to results of Prioritization (page 2)



Action Number: DEN-4
Mitigation Action/Initiative: Evaluation of Bridges and other Structures

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	No loss of life threat currently exists
Property Protection	1	Will improve hydraulic capacity of Rockaway River resulting in less damage from large storm events and flooding
Cost-Effectiveness	0	High costs associated with high level benefits
Technical	1	Modifying the bridges when they are scheduled for replacement due to structural problems or other issues to provide maximum benefits is technically feasible
Political	1	Political and overall public support for the project implementation
Legal	1	Legally Feasible
Fiscal	-1	New authorization or funding from another source is needed
Environmental	0	Will require standard land use permits from NJDEP
Social	1	Project will have positive impacts on frequently flooded areas adjacent to the structures
Administrative	1	Denville has the capabilities to implement and maintain the project
Multi-Hazard	0	Flood hazard and dam failure hazards addressed only
Timeline	0	Project goal is 1-3 years for the evaluation and planning. Actually construction of the modified bridges depends on the structural integrity of the bridges and when they need to be replaced and is potentially long term
Agency Champion	1	Advocated for by the governing body
Other Community Objectives	1	Addresses flood mitigation, dam failure (upstream Powerville Dam) & capital improvements
Total	7	
Priority (High/Med/Low)	Medium	



Name of Jurisdiction: Denville Township
Action Number: DEN-5
Mitigation Action/Initiative: 25 & 50-Year Level Protection Implementation

Assessing the Risk	
Hazard(s) addressed:	Flood, Severe Storms, Severe Winter Storms, Hurricane
Specific problem being mitigated:	Flood hazards for 25 and 50-year storm events
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Install levees or pump stations in the Township
	2. Do nothing – current problem continues
	3. No other feasible options were identified
Action/Project Intended for Implementation	
Description of Selected Action/Project	Implementation of segments (e.g., levee, pump stations) to provide 25-year or 50-year level of protection where the benefits are greater than the associated costs
Action/Project Category	Structure and Infrastructure (SIP)
Goals/Objectives Met	G-2, G-4
Applies to existing, future, or not applicable	Existing
Benefits (losses avoided)	Loss of Function, Road closures/detours
Estimated Cost	\$7,000,000 (High)
Priority*	High
Plan for Implementation	
Responsible Organization	Engineering
Local Planning Mechanism	Floodplain Management, Emergency Management Planning
Potential Funding Sources	Denville Twp., USEPA, NJDEP
Timeline for Completion	Short to Long term, 3-6 years
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: January 2015 Progress on Action/Project: Continuing

* Refer to results of Prioritization (page 2)



Action Number: DEN-5
 Mitigation Action/Initiative: 25 & 50-Year Level Protection Implementation

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Loss of life could be a threat in severe flood events
Property Protection	1	Extensive property damage in 25 and 50-year storm events
Cost-Effectiveness	-1	Very high cost associated with varying degrees of benefits
Technical	0	Due to the range of improvements needed, it may not be feasible in all areas that need protection
Political	1	Political and overall public support for the project implementation
Legal	1	Legally Feasible
Fiscal	-1	New authorization or funding from another source is needed
Environmental	0	Will require standard land use permits from NJDEP
Social	1	Project will have positive impacts on population adjacent to proposed improvements, particularly the Downtown Denville area and the nearby residential communities
Administrative	1	Denville has the capabilities to implement and maintain the project
Multi-Hazard	1	Floods, Severe Storms, Severe Winter Storms, Hurricanes
Timeline	-1	Project goal is 3-5 years for analysis and consideration. Design and construction will be a long-term goal.
Agency Champion	1	Advocated for by the governing body
Other Community Objectives	1	Addresses flood mitigation & capital improvements
Total	6	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Denville Township
Action Number: DEN-10
Mitigation Action/Initiative: Stream Cleaning & Maintenance

Assessing the Risk	
Hazard(s) addressed:	Flood, Severe Storms, Severe Winter Storms
Specific problem being mitigated:	Removal of debris and the buildup of sediment/silt in Rivers and in Floodplains to reduce flood risk and increase hydraulic capacity of river
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Remove debris and buildup of sediment/silt in rivers throughout the Township
	2. Do nothing – current problem continues
	3. No other feasible options were identified
Action/Project Intended for Implementation	
Description of Selected Action/Project	Promotion and action to clean streams and remove debris, including the buildup of sediment/silt. This includes the maintenance of bridge openings by removing debris that may reduce the risk of the bridge opening becoming obstructed during a storm. Floodplain areas adjacent to the river channel should be kept free of fall tree trunks and large branches so that these materials are not later carried into the river.
Action/Project Category	Natural Systems Protection (NSP)
Goals/Objectives Met	G-4
Applies to existing, future, or not applicable	Existing and Future
Benefits (losses avoided)	Physical property, road closures
Estimated Cost	\$100,000 (Medium)
Priority*	High
Plan for Implementation	
Responsible Organization	Twp. Engineer
Local Planning Mechanism	Floodplain Management
Potential Funding Sources	Denville Twp., NJDEP
Timeline for Completion	Short, 1-3 years (But continuous as well)
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: January 2015 Progress on Action/Project: Continuing

* Refer to results of Prioritization (page 2)



Action Number: DEN-10
Mitigation Action/Initiative: Stream Cleaning & Maintenance

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	No loss of life threat currently exists
Property Protection	1	Will reduce physical property losses and lessen road closings
Cost-Effectiveness	1	Low cost when compared to potential benefits
Technical	1	Feasible; Done frequently in other Municipalities
Political	1	Political and overall public support for the project implementation
Legal	1	Legally Feasible
Fiscal	-1	New authorization or funding from another source is needed
Environmental	0	Will require standard land use permits from NJDEP
Social	1	Project will have positive impacts on populations throughout Denville
Administrative	1	Denville has the capabilities to implement and maintain the project
Multi-Hazard	1	Flooding, Severe storm, Severe Winter Storm
Timeline	1	Can be completed immediately and continued in the future
Agency Champion	1	Advocated for by the governing body
Other Community Objectives	0	Addresses flood mitigation & capital improvements; may require easements from property owners to access certain portions of River
Total	9	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Denville Township
Action Number: DEN-11
Mitigation Action/Initiative: Cook's Pond Dam Improvements

Assessing the Risk	
Hazard(s) addressed:	Dam Failure
Specific problem being mitigated:	Dam failure or breach
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Develop and construct overtopping protection for Cook's Pond Dam
	2. Do nothing – current problem continues
	3. No other feasible options were identified
Action/Project Intended for Implementation	
Description of Selected Action/Project	Develop and construct overtopping protection for this Class II dam which has the potential for significant hazard if failure or breach were to occur. Failure would cause damage to property and project operation, but loss of human life is not envisioned. May damage isolated homes, major highways or railroads or cause interruption of service of relatively important public utilities.
Action/Project Category	Structure and Infrastructure (SIP)
Goals/Objectives Met	G-4
Applies to existing, future, or not applicable	Existing Dam, Future Improvements
Benefits (losses avoided)	Physical Property damage, loss of function, Road closings/detours
Estimated Cost	\$250,000 (High)
Priority*	High
Plan for Implementation	
Responsible Organization	Twp. Engineer
Local Planning Mechanism	Floodplain Management
Potential Funding Sources	Denville Township
Timeline for Completion	Short; 1-3 years
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: January 2015 Progress on Action/Project: Continuing; Plans have been developed and submitted to NJDEP for permitting purposes.

* Refer to results of Prioritization (page 2)



Action Number: DEN-11
Mitigation Action/Initiative: Cook's Pond Dam Improvements

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	Class II dam's do not pose threat to life
Property Protection	1	Class II dam's present significant risk to property damage
Cost-Effectiveness	1	Potential losses are very high if the dam fails compared to the cost to improve the existing dam
Technical	1	Technically feasible, long-term solution for dam protection
Political	1	Political and overall public support for the project implementation
Legal	1	Legally Feasible
Fiscal	-1	New authorization or funding from another source is needed for construction phase
Environmental	0	Will require standard NJDEP permitting, including Dam Safety
Social	1	Project will have positive impacts on population downstream of the Dam which include a significant portion of the residential community in Cedar Lake and Rock Ridge
Administrative	1	Analysis & design by Twp. Engineer, Construction by public bid process
Multi-Hazard	0	Dam safety related only
Timeline	1	Project goal is 1-3 years; Project has been designed and is currently in permitting phase
Agency Champion	1	Advocated for by the governing body
Other Community Objectives	1	Addresses capital improvements
Total	9	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Denville Township
 Action Number: DEN-13
 Mitigation Action/Initiative: DPW Generator

Assessing the Risk	
Hazard(s) addressed:	All
Specific problem being mitigated:	Loss of power to a critical facility in the Township
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Install backup generator for the Township DPW facility
	2. Do nothing – current problem continues
	3. No other feasible options were identified
Action/Project Intended for Implementation	
Description of Selected Action/Project	Provide a backup power source (generator) for the Denville Township department of public works facility.
Action/Project Category	SIP
Goals/Objectives Met	3
Applies to existing, future, or not applicable	New
Benefits (losses avoided)	Reduced vulnerability of critical facility and services to power outages
Estimated Cost	High (\$300,000)
Priority*	High
Plan for Implementation	
Responsible Organization	Township Administrator and Engineer
Local Planning Mechanism	Emergency Management
Potential Funding Sources	Township and HMGP
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (page 2)



Action Number: DEN-13
Mitigation Action/Initiative: DPW Generator

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	All hazards – loss of power from events that occur in the Township
Timeline	1	Project proposed to be completed in the next five years
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Denville Township
Action Number: DEN-15
Mitigation Action/Initiative: Valley View Fire House Generator

Assessing the Risk	
Hazard(s) addressed:	All
Specific problem being mitigated:	Loss of power to a critical facility in the Township
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Install backup generator at the Valley View Fire House
	2. Do nothing – current problem continues
	3. No other feasible options were identified
Action/Project Intended for Implementation	
Description of Selected Action/Project	Provide a backup power source (generator) for the Valley View Fire House.
Action/Project Category	SIP
Goals/Objectives Met	3
Applies to existing, future, or not applicable	New
Benefits (losses avoided)	Reduced vulnerability of critical facility and services to power outages, life safety.
Estimated Cost	Medium (\$75,000)
Priority*	High
Plan for Implementation	
Responsible Organization	Township Administrator and Engineer
Local Planning Mechanism	Emergency Management
Potential Funding Sources	Township and HMGP
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (page 2)



Action Number: DEN-15
Mitigation Action/Initiative: Valley View Fire House Generator

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Provide power to a critical facility that serves as a means of public safety
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	0	
Legal	0	
Fiscal	0	
Environmental	0	
Social	1	
Administrative	1	
Multi-Hazard	1	All hazards – loss of power from events that occur in the Township
Timeline	1	Project proposed to be completed in the next five years
Agency Champion	0	
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Denville Township
Action Number: DEN-17
Mitigation Action/Initiative: Tree Removal & Maintenance

Assessing the Risk	
Hazard(s) addressed:	Severe Storm, Severe Winter Storm
Specific problem being mitigated:	Trees that down power lines during storm events
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Tree removal and maintenance in township
	2. Do nothing – current problem continues
	3. No other feasible options were identified
Action/Project Intended for Implementation	
Description of Selected Action/Project	Tree removal and maintenance in the vicinity of power lines in order to minimize power outages from downed trees/tree limbs during severe storm and severe winter storm events
Action/Project Category	Structure and Infrastructure (SIP)
Goals/Objectives Met	G-2, G-4
Applies to existing, future, or not applicable	Existing
Benefits (losses avoided)	Loss of Function, Road closures/detours
Estimated Cost	\$30,000 (Medium)
Priority*	High
Plan for Implementation	
Responsible Organization	Twp. DPW
Local Planning Mechanism	Emergency Management Planning
Potential Funding Sources	Denville Twp.
Timeline for Completion	ASAP
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: January 2015 Progress on Action/Project: Continuing

* Refer to results of Prioritization (page 2)



Action Number: DEN-17
Mitigation Action/Initiative: Tree Removal & Maintenance

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	No loss of life threat currently exists
Property Protection	1	Protection of existing power lines
Cost-Effectiveness	1	Cost of tree removal is minimal in comparison to the potential losses in power outages both from the point of view of repairing the lines and from the homeowners losses
Technical	1	Tree removal is very feasible
Political	1	Political and overall public support for the project implementation
Legal	1	Legally Feasible
Fiscal	1	New authorization or funding from another source is needed
Environmental	-1	Removal of trees
Social	0	May get backlash due to the removal of healthy trees
Administrative	1	Denville has the capabilities to implement and maintain the project
Multi-Hazard	1	Severe Storms, Severe Winter Storms, Hurricanes, Winds
Timeline	1	Immediately and continuously
Agency Champion	1	Advocated for by the governing body
Other Community Objectives	1	Addresses capital improvements
Total	10	
Priority (High/Med/Low)	High	



Name of Jurisdiction: Denville Township
Action Number: DEN-18
Mitigation Action/Initiative: Catch Basin & General Storm Water Facility Maintenance

Assessing the Risk	
Hazard(s) addressed:	Flooding, Severe Storm, Severe Winter Storm
Specific problem being mitigated:	Storm water structures malfunctioning during large storm events during to improper maintenance or no maintenance.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Debris removal and maintenance around catch basins in Township
	2. Do nothing – current problem continues
	3. No other feasible options were identified
Action/Project Intended for Implementation	
Description of Selected Action/Project	Debris removal and maintenance in and around catch basins and other storm water facilities especially before and after large storm events so that they can function properly. A lack of maintenance may clog the systems and propagate local flooding.
Action/Project Category	Structure and Infrastructure (SIP)
Goals/Objectives Met	G-2, G-4
Applies to existing, future, or not applicable	Existing
Benefits (losses avoided)	Loss of Function
Estimated Cost	\$15,000 (Medium)
Priority*	High
Plan for Implementation	
Responsible Organization	Twp. DPW, Twp. Engineer
Local Planning Mechanism	Emergency Management Planning
Potential Funding Sources	Denville Twp.
Timeline for Completion	1-year (Short Term) and continuing in the future
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: January 2015 Progress on Action/Project: Continuing

* Refer to results of Prioritization (page 2)



Action Number: DEN-17
Mitigation Action/Initiative: Tree Removal & Maintenance

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	No loss of life threat currently exists
Property Protection	1	Protection of existing storm water structures from damage, protection from local flooding damage
Cost-Effectiveness	1	Cost of maintenance is minimal in comparison to the potential damages
Technical	1	Maintenance is feasible and undertaken by most municipalities
Political	1	Political and overall public support for the project implementation
Legal	1	Legally Feasible
Fiscal	1	Can be carried out by Denville Staff and volunteers
Environmental	1	No permitting required for maintenance
Social	0	Project will have positive impacts on populations throughout Denville
Administrative	1	Denville has the capabilities to implement and maintain the project
Multi-Hazard	1	Multi-hazard
Timeline	1	Project goal is 1 year (and continuously before and after large storm events)
Agency Champion	1	Advocated for by the governing body
Other Community Objectives	1	Addresses local maintenance issues
Total	12	
Priority (High/Med/Low)	High	