



Mitigation Plan for Four New Jersey Counties
Regional Hazard Mitigation Plan

Draft

April 17, 2015

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Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Regional Hazard Mitigation Plan for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contains highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	RP-i
Points of Contact	RP-v
Section 1: Introduction	RP.1-1
1.1: Mitigation Plan for Four New Jersey Counties	RP.1-1
1.2: Context	RP.1-3
1.3: Hazards and Risk	RP.1-7
1.4: Mitigation Measures	RP.1-8
Section 2: Planning Process	RP.2-1
Interim Final Rule Requirement for the Planning Process	RP.2-1
2.1: Planning Process Milestones	RP.2-1
2.2: Working Group Participation	RP.2-6
2.3: Public Participation	RP.2-8
2.4: Plan Integration	RP.2-8
2.5: Plan Adoption and Approval	RP.2-9
Section 3: Hazard Identification and Risk Assessment	RP.3-1
Interim Final Rule Requirements for Hazard Identification and Risk Assessment	RP.3-1
3.1: Hazard Identification and Ranking	RP.3-2
3.1.1: Hazard History in the Region	RP.3-2
3.1.2: SDVR Hazard Identification	RP.3-7
3.1.3: NJ4 HMP Hazard Identification	RP.3-8
3.1.4: Hazard Ranking	RP.3-9
3.2: Hazard Profiles and Risk Assessments	RP.3-18
3.2.1: Coastal Erosion and Sea Level Rise	RP.3-19
3.2.2: Dam Failure	RP.3-20
3.2.3: Drought	RP.3-21
3.2.4: Earthquake	RP.3-22
3.2.5: Extreme Temperature	RP.3-23
3.2.6: Flood	RP.3-24
3.2.7: Geologic Hazards	RP.3-25
3.2.8: High Wind	RP.3-26
3.2.9: Levee Failure	RP.3-27
3.2.10: Severe Weather – Summer	RP.3-28
3.2.11: Severe Weather – Winter	RP.3-29
3.2.12: Wildfire	RP.3-30
3.2.13: NJ4 Region Risk Assessment Results	RP.3-31
3.3: Critical Facilities Hazard Exposure Assessment	RP.3-35
3.4: Future Development Hazard and Risk Assessment	RP.3-40

Table of Contents

Section 4: Mitigation Measures	RP.4-1
Interim Final Rule Requirements for Mitigation Measures	RP.4-1
4.1: Mitigation Goals and Strategies	RP.4-2
4.2: SDVR HMP Mitigation Measures	RP.4-3
4.3: County and Municipal Mitigation Measures – Identification	RP.4-5
4.4: County and Municipal Mitigation Measures – Implementation	RP.4-12
4.5: Multi-Jurisdictional Mitigation Measures	RP.4-21
4.6: Plan Review and Integration	RP.4-24
 Annexes	
A: Acronyms, Abbreviations and Definitions	RP.A-1
B: Sources	RP.B-1
C: Planning Process	RP.C-1
D: Hazard Identification and Risk Assessment	RP.D-1
E: Mitigation Measures	RP.E-1
F: Plan Implementation	RP.F-1
 Appendices	
Camden County and Municipalities	CaC.1 through CaC.38
Cumberland County and Municipalities	CuC.1 through CuC.15
Gloucester County, Municipalities and Rowan University	GC.1 through GC.26
Salem County and Municipalities	SC.1 through SC.16

Table of Contents

List of Figures

Figure RP.1-1: NJ4 HMP Region Location Map	RP.1-3
Figure RP.1-2: NJ4 HMP Region Housing Units by Year Built	RP.1-5
Figure RP.1-2: NJ4 HMP Region	RP.1-6
Figure RP.3-1: NJ4 HMP Summary Risk Assessment – Hazard Ranking Results	RP.3-34
Figure RP.3-2: Critical Facility Locations and Hazard Exposure	RP.3-39
Figure RP.3-3: Future Growth Locations in Camden County	RP.3-41
Figure RP.3-4: Future Growth Locations in Gloucester County	RP.3-42
Figure RP.3-5: Future Growth Locations in Salem County	RP.3-43
Figure RP.3-6: Future Growth Locations in Cumberland County	RP.3-44
Figure RP.3-7: Percent Population Change by Municipality	RP.3-45
Figure RP.3-8: 2000 Population by Census Block Including Wildfire Intersection (High and Medium Density Wildland Urban Interface (WUI) and Extreme Fuel Hazard Risk	RP.3-47
Figure RP.3-9: 2010 Population by Census Block Including Wildfire Intersection (High and Medium Density Wildland Urban Interface (WUI) and Extreme Fuel Hazard Risk	RP.3-48
Figure RP.3-10: South-Central Gloucester County - 2000 Population by Census Block With Floodplains (PFIRM)	RP.3-50
Figure RP.3-11: South-Central Gloucester County - 2010 Population by Census Block With Floodplains (PFIRM)	RP.3-51
Figure RP.3-12: Lawrence Township in Cumberland County - 2000 Population by Census Block With Floodplains (PFIRM) and Coastal Increased Inundation Zones	RP.3-53
Figure RP.3-13: Lawrence Township in Cumberland County - 2000 Population by Census Block With Floodplains (PFIRM) and Coastal Increased Inundation Zones	RP.3-54
Figure RP.4-1: County and Municipal Mitigation Measures	RP.4-7
Figure RP.4-2: NJ4 HMP Multi-Jurisdictional Mitigation Measures	RP.4-23

Table of Contents

List of Tables

Table RP.1-1: NJ4 HMP Region Demographics	RP.1-4
Table RP.1-2: NJ4 HMP Region Ranking (Demographics)	RP.1-4
Table RP.1-3: NJ4 HMP Region Economics and Housing	RP.1-4
Table RP.1-4: NJ4 HMP Region Ranking (Economics and Housing)	RP.1-5
Table RP.3-1: Recent Hazards, Declared Emergencies, and Major Disasters In the Region	RP.3-3
Table RP.3-2: Hazards Profiled and Risk Assessments Completed for the SDVR HMPs	RP.3-7
Table RP.3-3: CPRI Probability of Future Occurrence Based on Previous Hazard Events	RP.3-10
Table RP.3-4: CPRI Magnitude/Severity of Potential Impacts Based on Previous Hazard Events	RP.3-10
Table RP.3-5: CPRI Warning Time of Hazard Event Based on Hazard Definition	RP.3-11
Table RP.3-6: CPRI Duration of Hazard Event Based on Hazard Definition	RP.3-11
Table RP.3-7: CPRI Regional Results	RP.3-12
Table RP.3-8: Municipal Working Group Hazard Ranking Results – Camden County	RP.3-13
Table RP.3-9: Municipal Working Group Hazard Ranking Results – Gloucester County	RP.3-14
Table RP.3-10: Municipal Working Group Hazard Ranking Results – Salem County	RP.3-15
Table RP.3-11: Municipal Working Group Hazard Ranking Results – Cumberland County	RP.3-16
Table RP.3-12: CPRI Compared to Average Municipal Hazard Rankings	RP.3-17
Table RP.3-13: Summary of Risk from Coastal Erosion and Sea Level Rise	RP.3-19
Table RP.3-14: Highest Ranked Municipalities regarding Dam Failure	RP.3-20
Table RP.3-15: High Hazard Potential Dam Summary Risk Assessment	RP.3-20
Table RP.3-16: Top 10 Municipalities with the Highest Percent of Agricultural Land Area	RP.3-21
Table RP.3-17: Municipalities With the Highest Earthquake Ranking Based on Population Per Square Mile	RP.3-22
Table RP.3-18: Municipalities With the Highest Earthquake Ranking Based on Building Permits	RP.3-22
Table RP.3-19: Municipalities With the Highest Overall Ranking Based on Vulnerable Populations and Household Incomes	RP.3-23
Table RP.3-20: Top Ten Municipalities Based on the Percent of Parcels in the SFHA, Ordered by Percentage of Parcels	RP.3-24
Table RP.3-21: Top Five Municipalities with the Highest Number of Parcels in the Moderate Susceptibility / Low Incidence Landslide Zone	RP.3-25
Table RP.3-22: Municipalities With the Highest High Wind Ranking Based on Building Permits	RP.3-26
Table RP.3-23: Top Ten Municipalities with the Highest Number of Parcels intersecting a 1,000 Foot Levee Buffer, Ordered by # of Parcels	RP.3-27
Table RP. 3-24: Municipalities Ranked High Based on Overall Rankings	RP.3-28
Table RP.3-25: Municipalities With the Highest High Wind Ranking Based on Building Permits	RP.3-29
Table RP.3-26: Municipalities with the Highest Amount of Land Area Intersecting Extreme Wildfire Fuel Hazard Risk and High/Medium Interface (WUI), ordered by Square Miles/Acres	RP.3-30
Table RP.3-27: NJ4 HMP Summary Risk Assessment – Hazard Ranking Results, Ordered by Numeric Hazard Ranking	RP.3-31
Table RP.3-28: Critical Facilities by Type and by County	RP.3-36
Table RP.3-29: Critical Facilities Hazard Exposure by County	RP.3-38
Table RP.3-30: Population and Wildfire Risk Comparison Summary	RP.3-46
Table RP.3-31: Population and Floodplain Risk Comparison Summary	RP.3-49
Table RP.3-32: Population and Sea Level Rise Risk Comparison Summary	RP.3-52
Table RP.4-1: Status of SDVR HMP Mitigation Measures	RP.4-4
Table RP.4-2: NJ4 HMP Mitigation Measures	RP.4-6
Table RP.4-3: NJ4 HMP Multi-Jurisdictional Mitigation Measures	RP.4-22
Table RP.4-4: NJ4 HMP Plans and Documents	RP.4-24

Section 1: Introduction

Contents of this Section

- 1.1 Mitigation Plan for Four New Jersey Counties
- 1.2 Regional Profile
- 1.3 Existing Authorities, Policies, Programs, and Resources
- 1.4 Hazards and Risk
- 1.5 Mitigation Measures

1.1 Mitigation Plan for Four New Jersey Counties

On October 30, 2000, President Clinton signed the Disaster Mitigation Act of 2000, also known as “DMA 2000”. DMA 2000 established a requirement that local and state governments must develop and adopt hazard mitigation plans (HMPs) to maintain eligibility for federal hazard mitigation grants and programs. On February 26, 2002, the Federal Emergency Management Agency (FEMA) published an Interim Final Rule (IFR) that provides specific requirements for the content of HMPs and detailed descriptions of the planning process that states and localities are required to observe. In addition, DMA 2000 stipulates that HMPs for counties and municipalities must be updated and reapproved every five years.

The *Mitigation Plan for Four New Jersey Counties* (NJ4 HMP) responds to those requirements for the participating jurisdictions within Camden, Gloucester, Salem, and Cumberland Counties in southwestern New Jersey. In April 2014, the counties initiated a project to update multi-jurisdictional HMPs that were approved by FEMA in 2010 and 2011. Direct participation in the project was open to all recognized government entities within these four counties. Seventy-six municipalities, one university, and four counties participated in the NJ4 HMP planning process for a total of 81 separate jurisdictions. More than 900 individuals were directly involved in the planning process. There were also opportunities for participation by the public and interested parties.

The respective county Offices of Emergency Management led the plan update effort with the assistance of Stuart Wallace LLC, hazard mitigation planning consultants. The project was funded by a grant from FEMA. The non-federal share of the FEMA planning grant was covered by the participation of individuals representing the counties, municipalities, and institutions.

Important terms related to the NJ4 HMP include:

- *Hazards* cause loss of life or injuries, property damage, and economic hardship. The NJ4 HMP addresses a range of natural hazards including floods, high winds, severe winter weather, and dam or levee failures.
- *Hazard mitigation* reduces or eliminates risk of death, injury, or damage to private or public property potentially caused by hazards.
- *Hazard mitigation plans* evaluate potential risk factors and identify hazard mitigation measures to address identified risks.
- *Hazard mitigation measures* include activities, programs, or projects such as improving public awareness about hazard risk and mitigation; improving regulations and codes that lead to safer structures; and construction projects to directly reduce potential impacts of hazards.

Section 1: Introduction

The NJ4 HMP has three main components:

1. *Regional Hazard Mitigation Plan* – includes summary information that is common to all participating jurisdictions in the NJ4 HMP.
2. *Annexes* – compiles detailed information supporting the Regional HMP.
3. *Appendices* – identifies hazard priorities, critical facilities, and mitigation measures for each participating county, municipality, and institution.

The *Regional Hazard Mitigation Plan* (and supporting detailed information in the Annexes and Appendices) is organized in four discrete sections:

Section 1: Introduction

Section 2: Planning Process

Section 3: Hazard Identification and Risk Assessment

Section 4: Mitigation Measures

Explanations are included in each Section regarding how IFR requirements are met by the content of the Regional HMP. *Annexes* provide supporting materials:

Annex A: Acronyms

Annex B: Sources

Annex C: Planning Process – including documentation for key meetings and public participation opportunities supporting descriptions of the planning process in Section 2 of the Regional HMP and Part 2 of the Appendices

Annex D: Hazard Profiles and Risk Assessments – providing detailed information for the identified natural hazards supporting summary information in Section 3 of the Regional HMP

Annex E: Mitigation Measures – describing common aspects of mitigation measures and projects identified in Part 4 of the Appendices

Annex F: Plan Implementation – cataloging information about implementation strategies and funding sources for mitigation measures

Appendices for the 81 individual counties, municipalities, and institutions have a similar organizational structure as the Regional HMP Sections but the components are designated as “Parts.”

Part 1: Overview

Part 2: Participation

Part 3: Hazard Identification and Risk Assessment

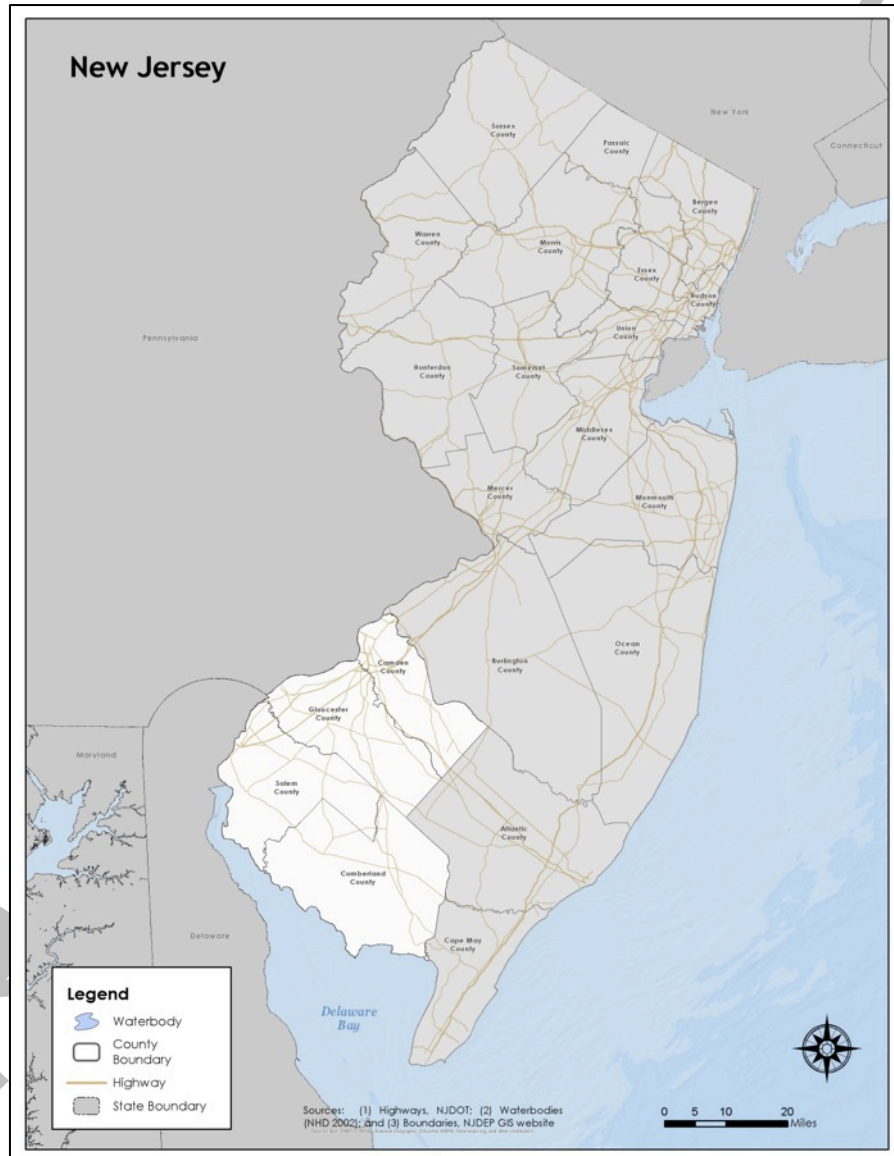
Part 4: Mitigation Measures

Appendices for individual jurisdictions are grouped within their respective counties for review purposes but the organizational structure provides an actionable document for each of the participating counties, municipalities, and institutions.

1.2 Regional Profiles

The NJ4 HMP includes participating jurisdictions in Camden, Gloucester, Salem, and Cumberland Counties in the southwest corner of New Jersey (See Figure RP.1-1), sometimes referred to as the “Southern Delaware Valley Region.” The region encompasses a highly diverse mix of land uses ranging from densely populated urban and suburban communities to the north within Camden and Gloucester Counties to smaller scattered cities and more sparsely settled agricultural and bayshore communities in Salem and Cumberland Counties in the south and west.

Figure RP.1-1: NJ4 HMP Region Location Map



Much of the region is considered part of the Philadelphia metropolitan area, which exerts a strong economic influence on the area. While a few discrete areas have experienced growth and development, much of the built assets in the region have not changed dramatically for several decades. For example, according to the 2010 US Census, almost two-thirds of the housing stock was built between 1940 and 1990 with less than 20% in the last two decades.

Section 1: Introduction

Table RP.1-1 is a compilation of demographic information for the region and comparison with the State of New Jersey and the United States.

Table RP.1-1: NJ4 HMP Region Demographics
(Source: Census DP-1, 2010 ACS 5-Year Estimates, DP 3, 4)

	Camden County	Gloucester County	Salem County	Cumberland County	Region	New Jersey	United States
2000 Population	508,932	254,673	64,285	146,438	974,328	8,414,350	281,421,906
2010 Population	513,657	288,288	66,083	156,898	1,024,926	8,791,894	308,745,538
Percent Change	0.93%	13.20%	2.80%	7.14%	5.19%	4.49%	9.71%
Population Density (per square mile)	2321.51	895.3	199.11	324.37	754.25	1,195.5	87.3
Land Area (square miles)	221.26	322.00	331.90	483.70	1,358.86	7,354.22	3,534,905.43
% of Population under 18 years	24.0	24.4	23.5	24.0	24.1	23.5	24.0
% of Population 18 – 64	63.0	63.2	61.5	63.4	62.7	63.0	63.0
% of Population 65 and older	13.0	12.4	15.0	12.6	13.2	13.5	13.0

Table RP.1-2 illustrates how the four counties rank in the region and New Jersey.

Table RP.1-2: NJ4 HMP Region Ranking (Demographics)

	Camden County		Gloucester County		Salem County		Cumberland County	
	Region (n=4)	NJ (n=21)	Region (n=4)	NJ (n=21)	Region (n=4)	NJ (n=21)	Region (n=4)	NJ (n=21)
Population Rank	1	8	2	14	4	21	3	16
Land Area Rank	4	17	3	10	2	9	1	4
Population Density Rank	1	7	2	13	4	21	3	17
Population Change Rank	4	-	1	-	3	-	2	-

Table RP.1-3 compares information related to economic and housing statistics for the four counties, the region, New Jersey, and United States.

Table RP.1-3: NJ4 HMP Region Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5-Year Estimates, DP 3, 4; NJ LWD 2010)

	Camden County	Gloucester County	Salem County	Cumberland County	Region	New Jersey	United States
Median Household Income	\$60,976	\$72,664	\$59,441	\$50,651	\$60,209	\$69,811	\$51,914
Total Number of Housing Units	204,943	109,796	27,417	55,834	397,990	3,529,033	131,704,730
Occupied Housing Units	190,980	104,271	25,290	51,931	372,472	3,176,069	116,716,292
Vacant Housing Units	13,963	5,525	2,127	3,903	25,518	352,964	14,988,438
Owner Occupied Housing Units	130,355	83,525	18,091	34,622	266,593	2,126,279	75,986,074
Renter Occupied Housing Units	60,625	20,746	7,199	17,309	105,879	1,049,790	40,730,218
Building Permits	487	716	105	246	1,554	13,535	594,800

Section 1: Introduction

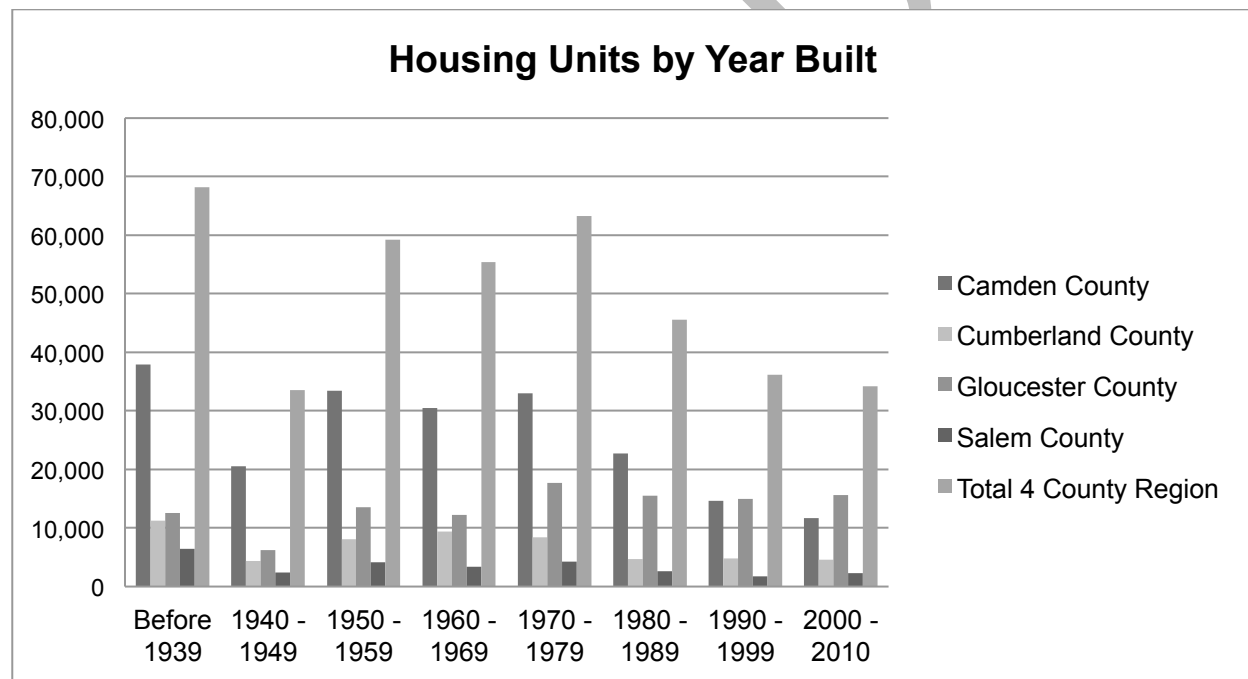
Table RP.1-4 illustrates how the four counties rank in the region and New Jersey.

Table RP.1-4: NJ4 HMP Region Ranking (Economics and Housing)

	Camden County		Gloucester County		Salem County		Cumberland County	
	Region (n=4)	NJ (n=21)	Region (n=4)	NJ (n=21)	Region (n=4)	NJ (n=21)	Region (n=4)	NJ (n=21)
Median Household Income Rank	2	15	1	12	3	20	4	21
Vacant Housing Units Rank	1	11	2	17	4	20	3	18
Renter Occupied Housing Units Rank	1	7	2	15	4	21	3	16
Building Permits Rank	2	14	1	7	4	21	3	18

Figure RP.1-2 illustrates development patterns in the region by examining housing units by year built. About one in six homes in the NJ4 HMP region were built prior to 1939.

Figure RP.1-2: NJ4 HMP Region Housing Units by Year Built
(Source: 2010 ACS 5-Year Estimates, DP 4)



Section 1: Introduction

The region consists of an equally diverse landscape. Per Figure RP.1-3, major water bodies include the Delaware Bay which transitions from south to north into the Delaware River and forms the northern, western, and southern borders of the region. The river is considered tidal along the entire boundary of the region and large expanses of the bayshore in Cumberland and Salem Counties are considered important marshlands. For example, Cumberland County includes part of an area designated by the New Jersey Department of Environmental Protection (NJDEP) as a Natural Heritage Priority Site.

Figure RP.1-3: NJ4 HMP Region



Other key water features include the Salem and Maurice Rivers and Union Lake in the southern counties and several smaller water courses run inland including Stow Creek, Alloway Creek, and the Cooper River. The eastern margin of the region is also considered part of the New Jersey Pinelands National Reserve, a combination of vegetation unique to the Atlantic seaboard.

The land is generally flat to gently rolling; the highest point in any of the four counties is only slightly more than 200 feet above sea level in inland Camden County. Major ground transportation routes include Interstates 295 and the New Jersey Turnpike, i.e., Interstate 95; US Routes 30, 40, 130, and 322; and New Jersey Route 55.

Note: Additional information about relevant characteristics of individual municipalities is included in Part 3 of the Appendices.

1.3 Existing Authorities, Policies, Programs, and Resources

1.3.1 Existing Authorities

Adoption and ultimate responsibility for implementation of the NJ4 HMP rests with the participating municipalities. In the State of New Jersey, counties and municipalities are authorized to manage their own affairs via a governing body. For counties, the governing body is known as the “Board of Chosen Freeholders”. For municipalities in the four county region, the governing bodies are usually referred to as “Councils” for boroughs or cities and “Committees” for townships.

The following is an excerpt from the relevant portions of the New Jersey Statutes for counties and municipalities, NJSA 40:20-1 and NJSA 40:42-2 respectively:

The property, finances and affairs of every county shall be managed, controlled and governed by a board elected therein, to be known as “the Board of Chosen Freeholders of the county of [county]” and the executive and legislative powers of the county shall be vested in the Board of Chosen Freeholders, except where by law any specific powers or duties are imposed or vested in a Constitutional officer.

The term “governing body”, where used in this subtitle, shall be construed to mean the board or body in each municipality designated by statute effective in such municipality as the board or body having control over the subject matter in connection with which the term is used, and having the power and authority to legislate thereon, whether designated as “board of aldermen”, “common council”, “board of commissioners”, “borough council”, “township committee”, “village trustees”, “improvement commission”, “board of street and water commissioners”, “board of public works”, “board of finance”, “board of health”, “park commissioners”, “recreation commissioners”, or otherwise.

Section 2.5: Adoption and Approval of the NJ4 HMP Regional Hazard Mitigation Plan and Part 1.2: Municipal Appendix of the individual jurisdiction’s Appendices provide descriptions of how and when the NJ4 HMP was reviewed, adopted by the governing bodies of the participating jurisdictions, and subsequently approved by FEMA.

Following adoption, the participating jurisdictions will exercise their authority to implement the NJ4 HMP through the policies, programs, and resources described in Part 1.3.2.

1.3.2 Policies and Programs

Section 4.6: Plan Review and Integration and related material in Annex E.2: Plan Review and Integration of the NJ4 HMP Regional Hazard Mitigation Plan include an inventory of relevant jurisdiction-specific plans and documents such as Emergency Operations Plans (EOPs), Floodplain / Stormwater Management Plans and Ordinances, Master Plans, and Reexamination Reports.

Some of these documents contain policy statements that have implications for hazard mitigation. For example:

- EOPs seek to minimize the impacts of disaster events by identifying how the jurisdiction will respond to disasters before, during, and after the events occur
- Floodplain and/or Stormwater Management Plans and Ordinances are intended to preserve natural and beneficial functions of floodplains for current and future residents and may include specific recommendations that align with flood mitigation efforts
- Master Plans and Reexamination Reports promote appropriate development in municipalities and generally include policy statements supporting public health and safety.

Section 1: Introduction

As described in Section 4.6, a review of these documents during the NJ4 HMP planning process in the majority of cases did not reveal explicit policy statements related to natural hazard mitigation. However, jurisdictions participate in a number of programs that relate directly and indirectly to natural hazard mitigation.

All of the participating counties and municipalities in the NJ4 HMP support Offices of Emergency Management (OEM). The duties and powers of these offices and their coordinators are articulated by NJOEM *Directive 61: Duties And Powers For Municipal Emergency Management Coordinators And County Emergency Management Coordinators*¹.

In the region, and generally across the State of New Jersey, OEMs at the county and municipal level are responsible for hazard mitigation planning and implementation. Historically, the focus of county and municipal OEMs has been emergency preparedness, response, and recovery as many of the OEMs are adjuncts to first responder organizations such as local police and fire departments.

However, numerous disaster declarations over the last several years have increased understanding and appreciation of the importance of hazard mitigation. As a result, county and municipal OEMs have conducted more frequent discussions at regularly scheduled OEM Coordinator meetings. These interactions will continue and increase during implementation of the NJ4 HMP to ensure effective utilization of resources and sustained efforts to improve mitigation components of overall emergency management programs.

Seventy-seven of the municipalities participating in the NJ4 HMP are also participants in the National Flood Insurance Program (NFIP) wherein property owners are able to secure flood insurance policies due to the community's commitment to reduce flood hazard risk. The commitment is manifested in the enactment and enforcement of Floodplain Management Ordinances by the participating municipalities. The performance of \ communities are reviewed periodically by the New Jersey Department of Environmental Protection and FEMA.

Part 4.6 of the municipalities' Appendices identifies:

- Current status of each participating NJ4 HMP municipality in the NFIP
- Involvement of the communities' designated Floodplain Administrators in the NJ4 HMP planning process. *Note: Administration of rules and regulations under the NFIP in the participating municipalities is more often within the purview of local building and construction officials or engineering departments rather than with the municipal OEMs.*
- Commitment to maintain compliance with NFIP requirements

It is important to note that there is an increasing interest in communities with larger numbers of flood insurance policies in force due to recent and anticipated increases in insurance premiums due to recent changes in the enabling legislation for the NFIP. This includes increasing interest in the NFIP Community Rating System (CRS) wherein communities can earn reduced premiums for policyholders through comprehensive sustained flood mitigation programs and activities.

All participating municipalities undertake two additional programs with implications for hazard mitigation under New Jersey laws:

- New Jersey Municipal Land Use Law: The Municipal Land-Use Law (MLUL) (NJSA 40:55D et al) is the legislative foundation of Planning Boards and Zoning Boards of Adjustment in the State of New Jersey. It defines the powers and responsibilities of boards and is essential to their functions and decisions. The MLUL also identifies the required content for Master Plans and periodic updates through Reexamination Reports. The specified content does include a requirement to map known floodplain areas but does not explicitly cross reference natural hazard mitigation.

¹ http://www.state.nj.us/njoem/about/law_directives_61.html

- New Jersey Uniform Construction Code: Enacting and enforcing the New Jersey Uniform Construction Code (UCC) (Chapter 23 of Title 5 of the NJ Administrative Code (NJAC 5:23) is a requirement of all municipalities in the state. The UCC cross-references the local Floodplain Management Ordinances per NFIP requirements ensuring NFIP compliance for new construction and substantial improvements to existing properties.

1.3.3 Resources

Consistent with Mitigation Measure M-1 in all the NJ4 HMP County and Municipal Appendices, *Annex F: Plan Implementation* of the NJ4 Regional Hazard Mitigation Plan includes an information and resource base that will be linked to the County OEM websites and where possible, links will also be established from and to the municipal OEM websites.

The intent is to create a way to provide consistent and current information about risk and mitigation to any interested party within the region without each jurisdiction having to maintain its own resource library. The website content will be updated periodically to make sure information about grant programs and risk information is as current as possible.

The following is a brief overview of key components of federal, state, and local resources.

Federal

The Federal Emergency Management Agency of the Department of Homeland Security (FEMA), is the lead agency at the federal level for hazard mitigation planning and implementation. Available FEMA resources include guidance for hazard mitigation planning, information about best practices based on the experiences of communities across the country, and hazard mitigation grant programs. In addition to relevant information included in Annex F, available FEMA resources are detailed on the FEMA website under the heading of Hazard Mitigation Planning Resources² and include (but are not limited to):

- Mitigation Planning Handbook
- Mitigation Fact Sheets
- Mitigation Grant Programs
- Sustainability in Mitigation Planning
- Planning Advisory Service Reports

One program in particular is a current focus of FEMA in New Jersey. The Risk Mapping, Assessment and Planning Program or “Risk MAP” builds on the success of FEMA’s Map Modernization Program and includes a number of digital mapping and data products for use by municipalities in current and future planning efforts. To the extent the information was available during the NJ4 HMP planning process, Risk MAP products are incorporated into *Section 3: Hazard Identification and Risk Assessment* and *Annex D: Hazard Identification and Risk Assessment* of the NJ4 HMP Regional Hazard Mitigation Plan.

Other federal agencies with potential resources for hazard mitigation are identified in Annex F and on the FEMA webpage include (but are not limited to):

- US Army Corps of Engineers
- US Department of Commerce, Small Business Administration
- US Geological Survey
- National Oceanic and Atmospheric Administration

² <https://www.fema.gov/hazard-mitigation-planning-resources>

State

State resources for hazard mitigation have an impact on the efficacy of local planning and implementation. In accordance with the State Hazard Mitigation Plan Update (SHMPU), the focus of New Jersey's statewide hazard mitigation effort is the New Jersey Office of Emergency Management (NJOEM), in the New Jersey State Police within the Office of the Attorney General.

SHMPU *Section 3: Coordination of Local Planning*³ itemizes hazard mitigation resources for the State of New Jersey and Annex F of the Regional Hazard Mitigation Plan also includes a number of programs administered and supported by NJOEM as well as other New Jersey Departments.

Municipal

As noted above, Municipal OEMs historically have led local hazard mitigation efforts including developing the original Southern Delaware Valley Region Multi-Jurisdictional Hazard Mitigation Plan approved by FEMA in 2010 and 2011, pursuit of grant funds when available, and implementation of hazard mitigation projects using local resources.

There are full-time OEM staff at the County OEMs but at municipal level, generally the OEM position is either part-time or covered on a volunteer basis. As noted above, the main focus of the OEMs has been response and recovery planning and activities and the orientation of many of the county and municipal OEM coordinators is that of first responders. Planning and implementation of mitigation has been limited due to lack of time and funding although recent disaster declarations (e.g., Superstorm Sandy) have resulted in the availability of FEMA Hazard Mitigation Assistance (HMA) funds.

A substantial effort was undertaken as part of the NJ4 HMP planning process to identify and engage stakeholders in the communities as part of the Municipal Working Groups to help increase local capacity and capabilities to plan and implement hazard mitigation projects. *Part 2.1: Municipal Working Group Participation* identifies the members of the Working Groups and their contribution for each of the participating municipalities. In addition, mitigation measures included in each Appendix articulate a commitment to conduct regular meetings of the Working Groups to ensure maximum participation and utilization of these additional resources.

³ http://www.ready.nj.gov/programs/mitigation_plan2014.html

1.4 Hazards and Risk

The NJ4 HMP region is vulnerable to a range of natural hazards. Since the original HMPs for the four counties were approved in 2010 and 2011, the region has experienced a large number of hazard events including seven that warranted presidential disaster declarations.

The NJ4 HMP Hazard Identification and Risk Assessment (HIRA) focused on 12 natural hazards:

- Coastal Erosion and Sea Level Rise
- Dam Failure
- Drought
- Earthquake
- Extreme Temperature
- Flood
- High Wind
- Geologic Hazards
- Levee Failure
- Severe Weather-Summer
- Severe Weather-Winter
- Wildfire

For each of these hazards, Annex D includes:

- Location of the Hazard
- Severity and Extent of the Hazard
- Occurrence and Future Probability of Hazard
- Risk Assessment
- Hazard Rankings

In addition, Section 3 of the Regional HMP explains the steps involved in the Critical Facility Hazard Exposure Assessment and follow-up efforts that are included in the mitigation measures for the participating counties and municipalities. The NJ4 HMP focused on identification and evaluation of critical facilities relative to the identified hazards at the municipal level. The intent was to make sure important emergency functions and facilities with vulnerable populations are adequately prepared for potential natural hazards.

The Regional HMP HIRA and related information in the Appendices indicate the following key conclusions regarding hazards and risk in the NJ4 HMP region:

- Within the NJ4 HMP region, municipalities located along the Delaware Bay and Delaware River (and its tributaries) are at greatest risk from flooding, coastal erosion and sea level rise, and storm surge.
- Due to projections of continuing Sea Level Rise, municipalities adjacent to the Delaware Bay, Delaware River, and its tributaries are, and will increasingly be, vulnerable to periodic inundation.
- Municipalities with the highest percentage of parcels in the 1% annual chance flood area are predominately located along or in close proximity to the Delaware Bay and Delaware River.

- As of August, 2014 the NJ4 HMP region had 312 Repetitive Loss (RL) and 13 Severe Repetitive Loss (SRL) properties, which accounts for only about 2% of the total RL and SRL properties in the state of New Jersey. The projected 1% annual chance flood risk to the repetitive loss properties in the NJ4 HMP region was calculated at \$5,929,269.
- The top four municipalities within the NJ4 HMP region with the highest potential earthquake, high wind, and winter weather risk (based on the percentage of building permits issued prior to 1975) were all located in Camden County.
- Levees are located in a total of 19 municipalities in the NJ4 HMP region, predominately within Cumberland and Salem Counties. The potential risk is greatest in Pennsville Township in Salem County where there are eight levees and 730 parcels within 1,000 feet of the levees.
- Areas at greatest risk from wildfire are predominately located in central to eastern Camden, Gloucester, and Cumberland counties. Camden County has the highest amount of land with potential wildfire fuel sources in proximity to developed areas.

Section 3 of the Regional HMP and Annex D also include descriptions of the process used to identify, prioritize, and assess risk from these natural hazards. In addition, Part 3 of the County and Municipal Appendices provide more detailed information from the municipal perspective regarding hazard priorities as well as the results of the Critical Facility Exposure Assessment.

1.5 Mitigation Measures

Common goals are included in the Regional HMP and the Appendices. The goals are broad policy statements representing desired long-term results:

- Goal 1: **Improve education and outreach efforts**
- Goal 2: **Improve data collection, use, and sharing**
- Goal 3: **Improve capabilities and coordination**
- Goal 4: **Plan and implement projects**

In addition, overarching strategy statements are included in Appendices that articulate objectives for each participating jurisdiction. Because risk and hazard mitigation issues across the region have common roots in predominant natural hazards and constraints on capabilities and resources, many of these strategy statements are similar. However, where community representatives participating in the planning process identified specific areas of interest, the strategy statements have been refined.

Participating municipalities in the four counties have identified hundreds of mitigation measures. Consistent with the identified goals, hazard mitigation measures include:

- Commitments to improving public awareness about hazard
- Identifying and evaluation critical facilities and risk-prone areas
- Promoting regulations and codes that lead to safer structures
- Enhancing capabilities and coordination between and within different levels of government
- Implementing construction projects to directly reduce hazard impacts

Annexes E and F include general descriptions of mitigation measures included in the NJ4 HMP. In addition, Part 4 of the County and Municipal Appendices provide more detailed information about the mitigation measures and implementation strategies for the participating counties, municipalities, and institutions.

Section 2: Planning Process

Contents of this Section

- Interim Final Rule Requirement for the Planning Process
- 2.1 Planning Process Milestones
- 2.2 Working Group Participation
- 2.3 Public Participation
- 2.4 Plan Integration
- 2.5 Plan Adoption and Approval

Interim Final Rule Requirements for the Planning Process

Requirement §201.6(c)(1): *[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

Requirement §201.6(a)(3): *Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process ...*

Requirement §201.6(b): *An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:*

- (1) *An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;*
- (2) *An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and*
- (3) *Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.*

Requirement §201.6(c)(5): *[The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan **must** document that it has been formally adopted.*

2.1 Planning Process Milestones

The *Mitigation Plan for Four New Jersey Counties* (NJ4 HMP) is the result of updating the *Southern Delaware Valley Region Hazard Mitigation Plans* (SDVR HMPs). The SDVR HMPs covered the counties and participating municipalities of Camden, Gloucester, Salem, and Cumberland Counties and were approved by the Federal Emergency Management Agency (FEMA) in 2010 and 2011. The following summarizes the NJ4 HMP planning process milestones:

1. Project Initiation and Kick-off Meetings
2. Data Acquisition / Preliminary Hazard Identification and Risk Assessment
3. Working Group Round 1 Work Sessions
4. Working Group Round 2 Work Sessions
5. Preliminary Regional Hazard Mitigation Plan and Appendices
6. Draft Regional Hazard Mitigation Plan and Appendices
7. Final NJ4 HMP Approval and Adoption
8. Workshops

Section 2: Planning Process

Milestone 1: Project Initiation and Kick-off Meetings

- Project Initiation Meeting was held with the NJ4 HMP Steering Committee, consisting of representatives of the four counties' Offices of Emergency Management (OEM), to confirm the overall approach, schedule, and responsibilities of all participants in the planning process.¹
- Project Kick-off Meetings were held with Municipal OEM Coordinators from all four counties as part of regular periodic Municipal OEM Coordinator Meetings to review the approach, schedule, and opportunities for municipalities to participate in the HMP update process.² In addition, online briefings were offered for municipalities unable to attend the Project Kick-off Meetings to provide an opportunity to understand the project and how their participation would be important to the successful outcome of the HMP update process.

Milestone 2: Data Acquisition / Preliminary Hazard Identification and Risk Assessment

Beginning with the Project Initiation Meeting and continuing through interactions with the counties and municipalities, relevant open source and available data were acquired and compiled regarding hazards, risk, capabilities, mitigation measures, and plan maintenance activities since the SDVR HMPs were approved.³

This included data and information readily available from the counties and municipalities as well as the State of New Jersey and FEMA. This work included producing Preliminary Hazard Identification and Risk Assessment information for use in County and Municipal Working Group Work Sessions (see Milestones 3 and 4).

- Data Acquisition and Compilation
 - Problem areas and concerns as reported by Work Session participants.
 - Related plans and documents in the four counties including recently updated Emergency Operations Plans (EOPs) and on-going long-term recovery planning (e.g., the *Cumberland County Delaware Bayshore Recovery Plan*, dated December 2013).
 - Critical facilities including municipal offices, emergency operations centers, police stations, fire stations, emergency medical services, schools, facilities with vulnerable populations, health care facilities, utility and transportation infrastructure, etc.
 - State of New Jersey data including relevant portions of the most current version of the New Jersey State Hazard Mitigation Plan (NJ SHMP).
 - FEMA data:
 - ✓ Risk Mapping, Assessment, and Planning, also known as Risk MAP regulatory and non-regulatory products.
 - ✓ National Flood Insurance Program (NFIP) policies and claims data including Repetitive Loss and Severe Repetitive Loss Property Lists.
 - ✓ Information from disaster declarations since the SDVR HMPs' approval dates.
 - ✓ Hazard Mitigation Grant Program and Pre-Disaster Mitigation project grants.
 - Data from other federal and state agencies such as open source information regarding hazard histories and impacts from the National Oceanic and Atmospheric Administration National Climatic Data Center and related databases.

¹ See Regional Hazard Mitigation Plan *Points of Contact* for a listing of the NJ4 HMP Steering Committee Members.

² See *Annex C: Planning Process* for the briefing materials used during the Project Kick-off Meetings and meeting dates for each of the four counties.

³ See *Annex B: Sources* for detailed listings of data and information incorporated in the NJ4 HMP.

Section 2: Planning Process

- Relevant research and on-going studies of sea level rise and climate change as it relates to HMPs in New Jersey including FEMA's Federal Insurance and Mitigation Administration's study regarding *The Impact of Climate Change and Population Growth on the National Flood Insurance Program through 2100* dated June 2013.
- Preliminary Hazard Identification & Risk Assessment (HIRA) relied on information that was readily available and included:
 - Updates to the hazard identification, profiles, priorities, vulnerability assessments, loss estimates, and summary risk assessments for natural hazards carried over from the SDVR HMPs. This work included updating the hazard identification for all relevant natural hazards, seeking consistency with the recently updated NJ SHMP, and assuring all relevant hazards were covered in appropriate county and municipal portions of the NJ4 HMP.
 - Use of appropriate methods and technology for vulnerability assessments and loss estimation including:
 - ✓ Calculated Priority Risk Index methodology for evaluating and ranking hazards on a regional basis. The methodology combines a hazard's probability of future occurrence, magnitude or severity of impact, typical warning time before an event occurs, and the duration of the event.
 - ✓ Participant input for determining priority hazards at the county and municipal levels.
 - Development of individualized reports on a municipality-by-municipality basis identifying HIRA results for each community including detailed information regarding the exposure of critical facilities to natural hazards. These municipal HIRA reports provided improved linkages between risk assessments and resulting mitigation measures.
 - Introducing climate variability implications into the discussion of risk and mitigation. Although the implications of climate change for all areas of the country are still coming into focus, it was important to start acknowledging and seeking to better understand potential impacts.

Milestone 3: Working Group Round 1 Work Sessions

Each of the 87 participating counties, municipalities, and institutions formed a separate Working Group.⁴ Individual Work Sessions were conducted with each of these Working Groups during the months of May through August 2014.⁵

The agenda for the first round of work sessions with Working Groups included discussions of:

- Public Participation – reiterating information shared during the Project Kick-off Meetings highlighting the advantages of broad participation by representatives of all concerned and interested parties within the community.⁶
- Capability Assessments and Plan Integration – including questions about current capabilities such as administration of the NFIP & potential participation in the Community Rating System (CRS) as well as soliciting other plans and documents to review regarding potential integration as part of the HMP update process.

⁴ See *Section 2.2: Working Group Participation* for information about how County and Municipal Working Groups were formed and functioned during the NJ4 HMP project.

⁵ See *Annex C: Planning Process* for an example of the briefing materials used during the Round 1 Work Sessions and the meeting dates for each of the individual Working Groups.

⁶ See *Section 2.3: Public Participation* for information about how County and Municipal Working Groups solicited public involvement during the NJ4 HMP project.

Section 2: Planning Process

- Preliminary HIRA Information - to validate work-in-progress and identify additional hazard and risk information. The review of preliminary HIRA information also set the stage for discussions of updated goals and mitigation measures.
- Critical Facilities – to improve available data about critical facilities including identifying if adequate back-up emergency generators were available where appropriate and if there were known issues for specific facilities related to natural hazards.
- SDVR HMP Mitigation Measures Implementation Status - compiling information about mitigation measures identified in the SDVR HMPs that have been or will be implemented since the SDVR HMPs were adopted and approved.
- Mitigation Measures - identifying actions, programs, or projects resulting from community experience during disasters since the SDVR HMPs were adopted including Hurricane Irene and Superstorm Sandy.
- Workshop Topics - identifying needs for workshops to aid in the long-term success of the county and municipal mitigation programs.⁷

Milestone 4: Working Group Round 2 Work Sessions

A second round of Work Sessions were conducted with the participating jurisdictions during the months of August through December 2014.⁸ The intent of the Round 2 Work Sessions was to confirm:

- Work-in-progress for Preliminary Appendices, based on Round 1 Work Sessions, were in line with Working Group and community input and priorities.
- Roles and responsibilities for implementation were accurately identified including the next step(s) in the implementation process.

Milestone 5: Preliminary Regional Hazard Mitigation Plan and Appendices

The results of the Working Group Work Sessions and the input of the Steering Committee was used to develop the *Preliminary Regional Hazard Mitigation Plan and Appendices* for all participating counties, municipalities, and institutions including:

- Revisions to the Preliminary HIRA Information - reflecting review comments and additional information received from the municipalities.
- Critical Facilities – including improved inventory information based on Working Group input and an assessment of the exposure of these facilities to identified natural hazards.
- Updates to Goals - as necessary and as determined by the Steering Committee and the Working Groups.
- Updates and additions to the Mitigation Measures and Implementation Strategies - including progress made in implementing the recommendations from the SDVR HMPs and new strategies identified as a result of the Round 1 Municipal Work Sessions. The update process:
 - Considered a full range of hazard mitigation project types.
 - Established priorities per Municipal Working Group preferences.

⁷ See *Milestone 8: Workshops* for a listing of topics identified by the Working Groups.

⁸ See *Annex C: Planning Process* for an example of the briefing materials used during the Round 2 Work Sessions and the meeting dates for each of the individual Working Groups.

Section 2: Planning Process

- Focused on mitigation measures that protect critical infrastructure and key resources from the most common hazards such as flooding but in all cases, sought to identify projects that optimized engineering feasibility, positive benefit cost ratios, and environmental impacts.
- Included measures to address Repetitive and Severe Repetitive Loss Properties as identified by the New Jersey Department of Environmental Protection (NJDEP).
- Identified mitigation measures that will require multi-jurisdictional approaches for implementation both vertically with county and state agencies and horizontally through cooperative agreements with other municipalities.
- Integrated mitigation measures and implementation strategies with other related planning initiatives (e.g., land use plans, flood control programs, natural resource studies, zoning ordinances, building codes, subdivision regulations, post-disaster public assistance grants, and capital improvements plans).
- Identified funding options including alternatives to federal hazard mitigation programs focusing on available community resources (i.e., public-private partners) and other grant programs.
- Updates and additions to Plan Maintenance Provisions - ensured that maintenance processes are institutionalized to the extent possible in a way that matches capabilities and normal business activities at the county and municipal levels including:
 - The use of appropriate tools to monitor implementation progress and provide status reports with minimal effort.
 - Identify new candidates for and enhance existing relationships with partners for long-term maintenance of HIRA information and other HMP update information.

The Preliminary Regional Hazard Mitigation Plan and Appendices were distributed to the Working Groups for review via the Project Website.⁹ Working Groups provided public notice of the availability of the documents and conducted public hearings during this review period. In addition, the Working Groups either convened additional Working Group meetings or otherwise corresponded to compile review comments.

Milestone 6: Draft Regional Hazard Mitigation Plan and Appendices

Review comments were incorporated in the Draft HMP Updates and the documents provided to New Jersey Office of Emergency Management (NJOEM) and FEMA Region II representatives for review. After addressing NJOEM and FEMA review comments, the Draft Regional Hazard Mitigation Plan and Appendices were designated as “approvable pending adoption.”

Milestone 7: Final NJ4 HMP Approval and Adoption

Final NJ4 HMP documents were prepared and distributed to the participating counties, municipalities, and institutions for adoption. Support for adoption of the Final HMP Update was provided including:

- Adoption Resolution templates designating responsible parties for on-going implementation of mitigation strategies and plan maintenance.
- Final NJ4 HMP to all participants in both digital and hard copies.

⁹ <http://nj4hmp.com>

Milestone 8: Workshops

Workshops were provided to further ensure the success of HMP implementation. The workshop topics were identified during the planning process based on interviews and surveys conducted during the Working Group Work Sessions as well as discussions with the Steering Committee. Workshops topics included:

- Multi-jurisdictional Implementation Efforts – bringing together representatives of concerned and potentially involved jurisdictions and agencies to discuss priorities and implementation strategies for projects that potentially benefit multiple jurisdictions and/or may represent municipal priorities but require other levels of government to implement.
- Plan Maintenance and Implementation – helping municipalities institutionalize methodologies beyond the typical five-year cycle, e.g., incorporating on-going data collection efforts into everyday government functions like permitting or property assessments and providing information about project scoping activities involving preliminary engineering feasibility, Benefit-Cost Analysis, and environmental impact analyses.
- Funding for Hazard Mitigation Measures – looking beyond FEMA Hazard Mitigation Assistance programs to find other public and private sector funding sources.
- Critical Facilities – describing the process for conducting site and facility assessments using the results of the Critical Facility Hazard Exposure Assessment.
- Repetitive and Severe Repetitive Loss Mitigation Measures – including providing Working Groups and Floodplain Administrators with the most current information about the National Flood Insurance Program, mitigation options for property owners, and potential local, state, and federal funding opportunities.
- CRS – focused on identifying and taking full advantage of individual community CRS program potential and / or familiarizing municipalities with the changes in the current *CRS Coordinator's Manual*.
- Climate Change and Adaptation Planning – keeping abreast of information and best practices in a dynamic situation.

2.2 Working Group Participation

The need to mobilize a Working Group was identified from the beginning of the planning process starting with the Project Kick-off Meetings and continuing throughout the Work Sessions. Each participating county, municipality, and institution made an effort to invite and incorporate the involvement of individuals, groups, and organizations from the community as part of their respective Working Groups.

The following was used as a list of potential members of the Municipal Working Groups:

- Elected Officials
- Municipal Office of Emergency Management (OEM) Coordinator
- Floodplain Administrator/Manager
- Land Use / Economic Development Planner
- Geographic Information Systems (GIS) / Information Technology (IT) Specialist
- Building Code / Construction Official
- Engineering, Public Works, and Transportation Department Directors / Supervisors
- Police, Fire, and Emergency Medical Services
- Business associations (e.g., Chamber of Commerce)
- Community / Faith-based organizations
- Environmental organizations (e.g., watershed or waterway-based non-profit advocacy groups)
- Non-governmental organizations (e.g., American Red Cross)
- Critical infrastructure and key resources (e.g., utilities)

Section 2: Planning Process

- Major employers and businesses
- Healthcare institutions
- Education institutions including school boards and local trade schools, community colleges, universities, etc.

A similar list was used to identify potential members of the County Working Groups:

- Board of Chosen Freeholders
- County Administrator's Office
- County Land Use / Economic Development Planner
- County GIS / IT Specialist
- County Soil & Water Conservation District
- County Engineering, Public Works, and Transportation Department Directors / Supervisors
- County Police, Fire, and Emergency Medical Services Coordinators
- County Volunteers Active in Disasters
- County Long-term Community Recovery Planning Committee

All of these positions, agencies, or organizations did not exist in every county or municipality. In addition, some individuals assume multiple roles and may have several of these responsibilities.

Together, more than 900 individuals participated as part of the county, municipal, and institutional Working Groups for the NJ4 HMP. *Part 2.1: Working Group Participation* in the Appendices itemizes the members of each participating county, municipality, and institution.

Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed NJ4 HMP documents. The duties and responsibilities of the Working Groups consisted of representing their communities' interests, and completing necessary planning tasks:

- Data collection - to provide background information and existing plans.
- Identification of critical facilities – to provide inventory information.¹⁰
- Identification of mitigation measures –to identify and document specific mitigation measures.¹¹
- Reviewing the Preliminary Regional Hazard Mitigation Plan and Appendices.

The general sequence for the Working Groups' participation included:

- Project Kick-off Meeting – attended by County and Municipal OEM Coordinators who served as the organizers and points-of-contact for the County and Municipal Working Groups.
- Round 1 and 2 Work Sessions – to develop and review work-in-progress.
- Preliminary Regional Hazard Mitigation Plan and Appendices reviews – including soliciting public comment and compiling review comments from the Working Groups.
- Consideration and approval of any changes made in the Final NJ4 HMP as a result of NJOEM or FEMA review comments.

In all, more than 200 Work Sessions and meetings were conducted during the planning process. *Annex C: Planning Process* contains example documentation for Work Sessions and meetings including agendas, sign-up sheets, presentation materials, and meeting notes where appropriate.

¹⁰ See *Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment* in the Appendices.

¹¹ See *Part 4.3: Mitigation Measures – Identification*, *Part 4.4: Mitigation Measures – Implementation*, and *Part 4.5: Multi-Jurisdictional Mitigation Measures* in the Appendices.

2.3 Public Participation

During development of the NJ4 HMP, a variety of opportunities were provided for the general public and interested parties to be involved and participate:

- Project Website - located at <http://nj4hmp.com>, the Project Website provided access to project status information and documents for public review and an opportunity to submit comments and questions. Participating counties, municipalities, and institutions provided links to the Project Website from their respective websites during the planning process and specifically to announce the availability of the Preliminary Appendices for public review.
- Flyers - explaining the on-going planning process were posted at municipal administrative offices and other locations in the communities.
- Public Education and Outreach Activities – conducted via community newsletters and/or at local schools, places of worship, and at established events such as county and local fairs, community service club meetings, etc.
- Working Group Work Sessions and Meetings – conducted in a forum that was open to the public.
- Public Meetings – including information items about the on-going planning process on the agendas for regularly scheduled public meetings of elected governing bodies or appointed officials and during the Preliminary Appendix review process.
- Public Adoption Proceedings¹² - the governing bodies of all participating jurisdictions adopted the NJ4 HMP. Meetings of the governing bodies occurred at open public meetings during which the public had an opportunity to voice support or concerns regarding the content of the NJ4 HMP.

Notice was sent to adjacent jurisdictions and other interested parties that the Draft and Final NJ4 HMP documents were available for review prior to adoption by the participating counties, municipalities, and institutions.

See *Part 2.1: Public Participation* and *Attachment A: Public Comments* of the Appendices for specific public comments received and how this information was incorporated into the NJ4 HMP.

2.4 Plan Integration

The NJ4 HMP planning process included examining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and plan integration considerations. *Section 4: Mitigation Measures* and related portions of *Annex F: Plan Implementation* of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels.
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation.
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level.

¹² See *Section 2.5: Plan Adoption and Approval*.

Section 2: Planning Process

Specific documents obtained during the plan update process from the Municipal Working Groups that were incorporated into these observations and recommendations regarding plan integration included:

- Emergency Operations Plans
- Master Plans and Reexamination Reports
- Land Development Regulations including Floodplain Management Ordinances and Zoning Ordinances
- Stormwater Management Plans and Ordinances
- Wildland Fire Management Plans
- Capital Improvement Budgets and Capital Improvement Programs

Other special reports and plans incorporated into the observations and recommendations included:

- Cumberland County Delaware Bayshore Recovery Plan
- NJDEP Coastal Community Resilience Evaluations

2.5 Adoption and Approval

In the State of New Jersey, counties and municipalities are empowered to manage their own affairs via an elected governing body. For counties, the governing body is known as the Board of Chosen Freeholders. Municipalities are categorized as cities, townships, and boroughs. The governing body for cities and boroughs is typically referred as the City or Borough Council while townships usually convene a Township Committee.

The following is an excerpt from the relevant portion of the New Jersey Statutes Annotated (NJSA 40:20 et seq.)¹³:

The property, finances, and affairs of every county shall be managed, controlled and governed by a board elected therein, to be known as "the board of chosen freeholders of the county of [County name] and the executive and legislative powers of the county shall be vested in that board of chosen freeholders, except where by law any specific powers or duties are imposed or vested in a Constitutional officer.

Due to the large number of counties and municipalities involved in the NJ4 HMP, a rolling review process was used. Therefore, adoption proceedings and approvals from FEMA Region II occurred at multiple dates in 2015. Part 1.2 of the Appendices identifies the relevant dates for each participating county, municipality, and institution.

The adoption and approval sequence applicable to all participating jurisdictions is as follows:

- FEMA Region II, in consultation with NJOEM, determined that the Regional Hazard Mitigation Plan and Appendices of the NJ4 HMP were “approvable pending adoption.”
- The Working Groups reviewed the Final Regional Hazard Mitigation Plan and Appendices and recommended that the corresponding governing body should adopt the NJ4 HMP.
- The Final Regional Hazard Mitigation Plan and Appendices was submitted to the governing body for each participating jurisdiction for review and adoption.
- The resulting Adoption Resolutions were then submitted to FEMA Region II (via the corresponding County Office of Emergency Management and NJOEM) for approval.

¹³ New Jersey Office of the Attorney General.

Section 2: Planning Process

- FEMA subsequently issued formal approval letters to NJOEM for each participating county, municipality, and institution that adopted the Plan.
- NJOEM, in turn issued approval letters to the approved jurisdictions.

Attachment B: Adoption Resolution of the NJ4 HMP Appendices contains the signed Adoption Resolution for each participating county, municipality, and institution.

Attachment C: Approval Letter of the NJ4 HMP Appendices contains the formal Approval Letters for each participating county, municipality, and institution.

Draft

Section 3: Hazard Identification and Risk Assessment

Contents of this Section

Interim Final Rule Requirements for Hazard Identification and Risk Assessment

- 3.1 Hazard Identification and Ranking
 - 3.1.1 Hazard History in the Region
 - 3.1.2 SDVR HMP Hazard Identification
 - 3.1.3 NJ4 HMP Hazard Identification
 - 3.1.4 Hazard Ranking
- 3.2 Hazard Profiles and Risk Assessments
 - 3.2.1 Coastal Erosion and Sea Level Rise
 - 3.2.2 Dam Failure
 - 3.2.3 Drought
 - 3.2.4 Earthquake
 - 3.2.5 Extreme Temperature
 - 3.2.6 Flood
 - 3.2.7 Geologic Hazards
 - 3.2.8 High Wind
 - 3.2.9 Levee Failure
 - 3.2.10 Severe Weather - Summer
 - 3.2.11 Severe Weather - Winter
 - 3.2.12 Wildfire
 - 3.2.13 NJ4 Region Risk Assessment Results
- 3.3 Critical Facilities Hazard Exposure Assessment
- 3.4 Future Development Hazard and Risk Assessment

Interim Final Rule Requirements for Hazard Identification and Risk Assessment

As noted in Section 1.1, the Interim Final Rule (IFR) identifies requirements the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) must meet. The following are specific IFR requirements related to hazard identification and risk assessment covered in this section of the Regional Hazard Mitigation Plan (Regional HMP):

Requirement §201.6(c)(2): *The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

Requirement §201.6(c)(2)(i): *[The risk assessment shall include a] description of the type...location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.*

Requirement §201.6(c)(2)(ii): *[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.*

Requirement §201.6(c)(2)(ii): *[The risk assessment] **must** also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged floods.*

Requirement §201.6(c)(2)(ii)(A): *The plan **should** describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.*

Requirement §201.6(c)(2)(ii)(B): *[The plan **should** describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.*

Requirement §201.6(c)(2)(ii)(C): *[The plan **should** describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*

Requirement §201.6(c)(2)(iii): *For multi-jurisdictional plans, the risk assessment **must** assess each jurisdiction's risks where they vary from the risks facing the entire region.*

In addition, the Federal Emergency Management Agency (FEMA) has identified expectations for hazard mitigation plan updates including descriptions of natural hazard events and effects since the previous hazard mitigation plan was adopted.

3.1 Hazard Identification and Ranking

3.1.1 Hazard History in the Region

During development of the NJ4 HMP, and consistent with IFR requirements, the Steering Committee reviewed and approved an assessment of hazards with the potential to impact the NJ4 HMP region. Portions of the four Southern Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans (SDVR HMPs) were retained, including historical hazard data. In addition, more recent occurrences and effects of natural hazards on the region were identified since the SDVR HMPs were adopted and approved.

Numerous federal agencies maintain a variety of records regarding losses associated with natural hazards, but unfortunately, no single source is considered to offer a definitive accounting of all losses:

- FEMA maintains records on federal expenditures associated with declared major disasters
- The United States Army Corps of Engineers (USACE) and the Natural Resources Conservation Service collect data on losses during the course of some of their ongoing projects and studies
- The National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC) and Spatial Hazard Events and Losses Database for the United States (SHELDUS) collect and maintain data about natural hazards in summary format

Note: Both NOAA and SHELDUS include data about the number of occurrences, dates, injuries, deaths, and costs. Due to recent changes in the structure of how the data is collected by NOAA (some hazards are reported by National Weather Service (NWS) forecast zone such as drought and winter weather), it is becoming more difficult to accurately identify statistics from the NCDC about the number of past events at the county level and injuries and deaths related to each occurrence.

The NJ4 HMP Planning Team made efforts to accurately identify historical data statistics to the extent possible, considering the limitations of available data.

In the absence of definitive data on some of the hazards that may occur in the region, illustrative examples are useful. Table RP.3-1 provides brief descriptions of particularly significant hazard events occurring in the region's history. This list does not necessarily capture every event that has affected the region; rather, it lists some of the more significant events that have occurred here in the recent past.

The NJ4 HMP region has received 21 major Presidential Disaster Declarations and six Emergency Declarations since 1962. Eleven of the 21 major disaster declarations were the result of significant flooding. Of these major disaster declarations, seven occurred since the adoption and approval of the SDVR HMPs. All of the major and emergency declarations and several other non-declared events are included as part of the summary in Table RP.3-1.

Table RP.3-1: Recent Hazards, Declared Emergencies, and Major Disasters in the Region, 1962-2014
(Sources: NOAA/NCDC; FEMA; New Jersey Office of Emergency Management and the Public Entity Risk Institute)

Date and Disaster (DR)	Nature of Event
3/09/1962 (DR-124)	SEVERE STORMS, HIGH WINDS, AND FLOODING – Statewide, the event resulted in damages estimated at \$88.4 million (damage estimate adjusted to dollar figures for the year 2003).
8/18/1965 (DR-205)	WATER SHORTAGE – Statewide, the event resulted in damages estimated at \$6.4 million (damage estimate adjusted to dollar figures for the year 2003).
9/04/1971 (DR-310)	HEAVY RAINS AND FLOODING – Statewide, the event resulted in damages estimated at \$55.8 million (damage estimate adjusted to dollar figures for the year 2003).
2/08/1977 (DR-528)	ICE CONDITIONS – Statewide, the event resulted in damages estimated at approximately \$989,000 (damage estimate adjusted to dollar figures for the year 2003).
10/19/1980 (DR-3083)	WATER SHORTAGE (Emergency Declaration) – Statewide, the event resulted in damages estimated at \$5 million (damage estimate adjusted to dollar figures for the year 2003).

Section 3: Hazard Identification and Risk Assessment

Date and Disaster (DR)	Nature of Event
3/13/1993 (DR-3106)	SEVERE STORMS AND FLOODING (Emergency Declaration) – Event known as the <i>Storm of the Century</i> affected as many as 26 states from Florida to Maine, the Gulf Coast, and the Ohio Valley. One of the most intense nor'easters to ever affect the United States. The <i>Storm of the Century</i> label was given to the event due to the record low pressure, wind speeds, temperature, and snowfall. All 21 counties in New Jersey were included in the Presidentially Declared Disaster.
1/7/1996 (DR-1088)	BLIZZARD — A State of Emergency was declared for the blizzard that hit the state. Road conditions were dangerous due to the high winds and drifts. Both government and contract snow plowing operations were running at a maximum. Local roads were impassable. This blizzard also brought on coastal flooding with the high tides of Sunday evening and Monday morning, and there were reports of damage to dunes and beaches from the heavy wave activity. More than 400 National Guard personnel were activated for transport assistance, primarily for medic missions. In Camden County, snowfall totals ranged from 19"-32".
1/19/1996	FLASH FLOOD – The flash flooding of the afternoon and early evening of January 19, 1996 led to larger river flooding through January 21. The worst damage occurred along the Delaware River which crested at its highest stages in most places since the summer of 1955. In Camden County, the Cooper River at Haddonfield crested at 3.27' at 4:00pm on the 19th, .5' above flood stage of 2.8'. The Cooper River was back within its banks during the early morning hours on the January 20. Total damages from the event were estimated at \$10.7 million.
9/16/1999 (DR-3148)	HURRICANE FLOYD (Emergency Declaration) – This downgraded fall hurricane put the entire eastern seaboard on flood watch, including every county in New Jersey. The storm lasted approximately 18 hours resulting in rainfall totals of 7.3" in Camden County. The combination of winds funneling into the Delaware Bay and the Delaware River, and the record runoff from inland waterways produced minor to moderate tidal flooding at times of high tide in the counties of Cumberland, Salem, Gloucester, Camden, and Burlington, forcing evacuations in low-lying areas. Across the southern half of New Jersey, the heaviest rain and the most widespread flooding occurred in townships along the Delaware River. The worst flooding occurred along some of the larger waterways in the area (Cooper River in Camden County, Rancocas Creek in Burlington County) and along tidal sections of tributaries to the Delaware River. In Camden County the worst flooding occurred in Collingswood along US Route 130 between the Airport Circle and Collings Avenue. Some homes were flooded and evacuated as raw sewage was present. Flooding from Hurricane Floyd knocked out a state psychiatric hospital's wastewater treatment plant in Winslow Township.
11/01/2000 (DR-3156)	WEST NILE VIRUS (Emergency Declaration) – Statewide, the event resulted in damages estimated at approximately \$2.9 million (damage estimate adjusted to dollar figures for the year 2003).
9/19/2001 (DR-3169)	FIRES AND EXPLOSIONS (Emergency Declaration) – Statewide, the attacks of September 11,, 2001 resulted in damages estimated at approximately \$100 million (damage estimate adjusted to dollar figures for the year 2003).
2/16/2003 (DR-3181)	HEAVY SNOW (Emergency Declaration) – The most powerful storm to affect New Jersey since the blizzard of 1996. The combination of the very cold temperatures and the approach of a strong storm system caused widespread snow to break out, starting before sunrise on Sunday, February 16. Snow continued during Sunday day, heavy at times, and continued into Sunday night. Precipitation continued on Monday, before finally coming to an end on Tuesday. Total snowfall in Camden County ranged from 12" to 25". New Jersey requested and was granted a Snow Emergency Declaration for all 21 counties. The President's Day snowstorm tied or set records in all 21 New Jersey counties including Camden County. Statewide, the event resulted in damages estimated at approximately \$30.2 million (damage estimate adjusted to dollar figures for the year 2003).
7/12/2004 (DR-1530)	FLASH FLOOD – During the afternoon and early evening of the July 12, a series of thunderstorms with torrential downpours and heavy rain moved across Camden County and Burlington County. The combination of the heavy rain in Camden County and the runoff from streams in Burlington County produced record breaking crests along the Copper River and Pennsauken Creek in Camden County. Widespread poor drainage flooding occurred. The worst flooding damage occurred in both Camden City and Cherry Hill. Property damage from the event was estimated at \$5.0 million, most in Cherry Hill. The flood damage in Cherry Hill was centered in the Fox Run Development on Sequoia Road. The development backs to the North Branch of the Cooper River. The main stem of the Cooper River flooded homes in Collingswood.

Section 3: Hazard Identification and Risk Assessment

Date and Disaster (DR)	Nature of Event
8/28/06	Thunderstorms with torrential downpours dropped between 4" and 5" across northwestern Camden County and caused flash flooding in the northwest part of the county particularly in Camden City, Pennsauken, and Collingswood. Flooding also occurred along the Cooper River. Major roadways including Admiral Wilson Boulevard, US routes 30 and 130, and New Jersey state routes 38 and 70 were flooded as far southeast as Cherry Hill. In Camden City, about 10 to 12 families were evacuated, some by raft in and around the Westfield Garden Apartments. Basements of apartments were completely flooded. In Collingswood, 16 homes on Cattell Avenue near the often flooded Collingswood Circle, sustained water damage in their basements. The South Branch of the Pennsauken Creek flooded homes on King George Road in Cherry Hill. The Cooper River flooded parkland in Collingswood, Haddon, and Haddonfield. Damage from the event was estimated at \$250,000 in Camden County.
9/19/2005 (DR-3257)	HURRICANE KATRINA EVACUATION - The President declared an emergency in the State of New Jersey and ordered Federal aid to supplement state and local response efforts to assist evacuees from the area struck by Hurricane Katrina. The President's action made Federal funding available to the State and all 21 counties of the State of New Jersey. Specifically, assistance was available to State and eligible local governments for emergency protective measures that are undertaken to save lives and protect public health and safety.
4/15/2007 (DR-1694)	SEVERE STORMS AND INLAND AND COASTAL FLOODING - A seven-day nor'easter deluged New Jersey with over 9" of rain, causing millions of dollars of damage and killing three residents. Statewide damage was estimated at \$180 million. In Camden County, the heavy rain caused vehicles to become stranded. In Collingswood, US Route 130 was closed in three places. New Jersey state routes 45 and 70 were flooded. Flooding along the Great Harbor River closed roadways in Winslow.
6/7/2008	EXCESSIVE HEAT - Region wide heat wave resulted in 21 heat related injuries. The combination of high temperatures well in the 90s and dew point temperatures in the 70s produced heat index values around 100. Cooling centers were opened to assist senior citizens. The heat caused a few roadways to buckle. Schools dismissed children early or cancelled classes.
8/10/2008	HAIL - An unusually strong upper air disturbance helped trigger numerous severe thunderstorms across New Jersey. In Salem County, golf ball sized hail caused approximately \$250,000 in property damage to car dealerships. Crop damages from the hail total \$5 million. Ninety percent of the crops on a 650-acre farm was destroyed by hail.
11/12/2009	FLOODING AND HEAVY RAIN - A powerful Nor'easter produced wind gusts up to 60 mph, widespread moderate tidal flooding, heavy rain, and beach erosion causing an estimated \$180 million in damages. Considered one of the worst nor'easters since 1990, several thousand people lost power, approximately 100 people left their homes, and cities lost several millions of cubic yards of sand.
2/5/2010 (DR-1873)	SNOWSTORM - A major winter storm dropped heavy snow across all of New Jersey except for Sussex County. The heaviest snow fell along and east of the Interstate 95 corridor. Snowfall averaged 12 to 24 inches (with some locally higher amounts) across central and southern New Jersey. The 23.2 inches of snow that fell at the Philadelphia International Airport was the second heaviest snowfall on record. The NCDC reported numerous accidents snarled traffic on Interstates 295 and 676 in Camden County. Total impact estimate of \$14,272,280.
3/23/2010 (DR-1889)	WINTER STORM AND SNOWSTORM - A major winter storm dropped 20 to 30 inches of snow across the southern third of New Jersey. Blizzard conditions occurred with winds gusted up to 50 mph. Total impact estimate of \$15,873,670.
4/2/2010 (DR-1897)	SEVERE STORMS AND FLOODING - The slow-moving storm produced extensive coastal flooding and beach erosion. New Jersey was particularly hard hit with flooding and wind damage. The strong winds which frequently gusted 50-60 mph in most areas and up to 70 mph in spots wreaked the most havoc statewide, toppling numerous trees onto roads, cars, houses, and power lines causing widespread power outages. Wind and rain forced the closure of parts of the New Jersey Turnpike, and near complete shutdown of the NJ Transit system. PSE&G reported about 459,000 customers lost power during the height of the storm on Saturday March 13th, making it the worst storm in the utility's history. Thousands of businesses and residents in flood prone areas across the state experienced damage where major flooding occurred.
7/21/2011	EXCESSIVE HEAT - The last and hottest day of a four day heat wave had high temperatures that reached into the mid-90s and heat index values near 100°F across New Jersey, causing 10 injuries. Heat related illnesses were reported by medical centers as nausea, dizziness, and dehydration.
8/14/2011	DAM FAILURE - In southern Gloucester, eastern Salem, and western Cumberland counties rainfall totals ranged from seven to 11 inches. Four dams failed, causing an estimated \$25 million in damages.

Section 3: Hazard Identification and Risk Assessment

Date and Disaster (DR)	Nature of Event
8/14/2011	FLOODING - A series of thunderstorms proceeding a cold front dropped three to seven inches of rain across New Jersey. The runoff from the heavy rain caused flooding in northern Gloucester County including the Mantua Creek basin. The event was attributed to one death. A woman drowned after she drove into the swollen creek.
8/31/2011 (DR-4021)	HURRICANE IRENE - Hurricane Irene produced torrential downpour rains that resulted in major flooding and a number of record breaking crests on area rivers, and moderate to severe tidal flooding with extensive beach erosion. North Jersey, and Central Jersey where flooding was widespread, experienced significant damage. Floods in Cumberland County were the extent of the damage in the southern part of the state, particularly in Bridgeton, which received damage to infrastructure from a storm a week earlier. Severe river flooding occurred along the Delaware River and its tributaries due to record rainfall. The effects of Hurricane Irene in New Jersey included about \$1 billion in damage to 200,000 homes and buildings. Damages in Salem County were estimated to be \$10 million.
9/15/2011 (DR-4033)	FLOODING - Between August 13 and 14, 2011, heavy rains brought flash flooding and flooding of several moderate-sized rivers in southwest and central New Jersey. Eastern Salem, western Cumberland, eastern Gloucester, eastern Camden, and western Atlantic Counties were especially hit hard. Roads and several dams were overtopped or destroyed in these counties. Rainfall totals in these counties included 10.82 inches in Upper Deerfield Township (Cumberland County), 8.53 inches in Franklin Township (Gloucester County), 8.04 inches in Winslow Township (Camden County), and 7.51 inches at Hammonton (Atlantic County). Wind gusts downed trees and wires in some locations. In Cumberland, Gloucester, and Salem Counties, more than 181 homes were damaged. Specifically, 33 homes received major damage, 116 homes received minor damage, and 32 homes were considered affected. Many bridges, dams, and roadways were washed away in these counties and Rowan University in Gloucester County sustained substantial water damage. Overall, this severe storm event resulted in 1 death and over \$25 million in property damages in New Jersey.
7/19/2012 (DR-4070)	DERECHO - A well-organized cluster of thunderstorms with a history of producing widespread damaging winds advanced into a hot, unstable air mass over the Mid Atlantic. Salem, Cumberland and Atlantic Counties were hit the hardest. The counties were battered by the derecho which downed trees, power lines and poles, sparked fires and destroyed some homes. There were three storm related deaths including two boys camping in Salem County. A preliminary damage assessment put the cost at around \$20 million for the three counties. In all sixteen homes were destroyed, ninety-two suffered major damage, one hundred eighty-seven suffered minor damage and another one hundred and twelve were affected by the derecho. In addition, forty-one businesses suffered major damage and three hundred twenty-nine suffered minor damage.
10/30/2012 (DR-4086)	HURRICANE SANDY - The largest Atlantic hurricane on record, as well as the second-costliest Atlantic hurricane in history, Hurricane Sandy devastated portions of the Caribbean, Mid-Atlantic and Northeastern United States. Sandy is estimated to have caused damage of at least \$20 billion. Preliminary estimates of losses that include business interruption surpass \$50 billion. At least 191 people were killed (12 in New Jersey) along the path of the storm in seven countries.
2/12/2014	WINTER STORM - A winter storm dropped heavy snow and sleet as well as some freezing rain across most of New Jersey, except for the immediate coast. Snowfall and sleet totals averaged 10 to 20 inches from around the Interstate 95 corridor northwestward. Governor Chris Christie declared a state of emergency and New Jersey State Offices were closed and non-essential personnel did not have to report to work. Many schools, malls, businesses, other government and local offices as well as municipal courts never opened on the 13th.
4/23–26/2014	WILDFIRE - The combination of strong gusty northwest winds, the lack of significant rain in over a week and low relative humidity levels helped several major wildfires spread quickly across New Jersey. A wildfire in Edward G Bevan Fish and Wildlife Management Area (between Spring Garden and Shaw Mills Road) of Cumberland County resulted in 1,535 acres burned. Dividing Creek-Millville Road from Battle Lane to Railroad Avenue and Ackley Road from Dividing Creek-Millville Road to Shaws Mill Road to protect residents and stage fire equipment. A wildfire in Wharton State Forest (west of U.S. Route 206, south of Atsion Road and north of Chew Road) of Camden County resulted in 907 acres burned.

In addition to these discrete events, the region has been and will continue to experience incremental increased risk due to sea level rise effects in the Delaware Bay and Delaware River. *Annex D.1: Coastal Erosion and Sea Level Rise* includes current information and references regarding the past experience and potential long-term implications of this particular natural hazard.

Section 3: Hazard Identification and Risk Assessment

3.1.2 SDVR HMP Hazard Identification

In the initial phase of the NJ4 HMP planning process, the Steering Committee reviewed the 21 hazards identified, profiled, and assessed in the four SDVR HMPs.

Table RP.3-2: Hazards Profiled and Risk Assessments Completed for the SDVR HMPs

	Camden		Gloucester		Salem		Cumberland	
	Profile	RA	Profile	RA	Profile	RA	Profile	RA
Dam Failure	☑	☑	☑	☑	☑	☑	☑	☑
Drought	☑		☑		☑		☑	
Earthquake/Geological	☑	☑	☑	☑	☑	☑	☑	☑
Erosion	☑		☑		☑		☑	(3)
Extreme Temperature – Cold	☑		☑		☑		☑	
Extreme Temperature – Heat	☑		☑		☑		☑	
Flood	☑	☑	☑	☑	☑	☑	☑	☑
Hail	☑		☑		☑		☑	
Hazardous Materials Release – Fixed Site	☑		☑		☑		☑	
Hazardous Materials Release – Transportation	☑		☑		☑		☑	
High Wind – Straight-Line Winds	☑	☑	☑	☑	☑	☑	☑	☑
High Wind – Tornado	☑		☑		☑	☑	☑	☑
Ice Storm	☑		☑		☑		☑	
Landslide (non-seismic)	☑		☑		☑		☑	
Levee Failure	☑		☑	☑	☑	☑	☑	☑
Losses, Crops	☑		☑		☑		☑	
Losses, Fishing	☑		☑		☑		☑	
Severe Storm – Lightning	☑		☑		☑		☑	
Severe Storm – Winter Weather	☑	☑	☑	☑	☑	☑	☑	☑
Storm Surge	☑		☑		☑		☑	(3)
Wildfire	☑	(1)	☑	(2)	☑		☑	(4)

Legend

- *Profile*: Hazard was identified and profiled in SDVR HMPs
- *RA*: Hazard was identified as high priority and risk assessed in the SDVR HMPs

Notes re: SDVR HMP HIRAs:

- (1) *Wildfire* - Townships of Waterford and Winslow in Camden County
- (2) *Wildfire* - Townships of Franklin and Monroe in Gloucester County
- (3) *Erosion* and *Storm Surge* - Townships of Commercial, Downe, Fairfield, Greenwich, Lawrence, and Maurice River in Cumberland County
- (4) *Wildfire* - Townships of Commercial, Lawrence, and Maurice River, and Millville City in Cumberland County

3.1.3 NJ4 HMP Hazard Identification

The Steering Committee reviewed the hazards included in the SDVR HMPs and decided to update the list of relevant hazards in order to:

- Increase consistency with the current New Jersey State Hazard Mitigation Plan
- Eliminate man-made hazards
- Combine hazards of a similar nature

The following changes were made to the list of identified hazards:

- Changed "Earthquake/Geological" to "Earthquake"
- Combined "Erosion" and related aspects of "Storm Surge" into a single hazard called "Coastal Erosion & Sea Level Rise"
- Integrated non-erosion, i.e., "coastal flooding" aspects of "Storm Surge" into "Flood"
- Combined "Extreme Temperature – Cold" and "Extreme Temperature – Hot" into a single hazard called "Extreme Temperature"
- Combined "Hail" and "Severe Storm – Lightning" into a single hazard called "Severe Weather – Summer"
- Deleted "Hazardous Materials Release – Fixed Site"; "Hazardous Materials – Transportation"; "Losses, Crops"; and "Losses, Fishing"
- Combined "High Wind – Straightline Wind" and "High Wind – Tornado" into a single hazard called "High Wind"
- Combined "Ice Storm" and "Severe Storm – Winter Weather" into a single hazard called "Severe Weather – Winter"
- Changed "Landslide" to "Geologic Hazards"

As a result, the Steering Committee determined that the following 12 hazards posed the greatest threat to the four-county region and selected them for inclusion in the NJ4 HMP.

1. Coastal Erosion and Sea Level Rise
2. Dam Failure
3. Drought
4. Earthquake
5. Extreme Temperature
6. Flood
7. High Wind
8. Geologic Hazards
9. Levee Failure
10. Severe Weather - Summer
11. Severe Weather - Winter
12. Wildfire

Sections 3.2.1 through 3.2.12 of the Regional HMP provide summary results for these 12 hazards. In addition, *Annex D: Hazard Profiles and Risk Assessments* include detailed profiles each of these 12 hazards and include a description of the hazard, location and extent of the hazard, severity of the hazard, impact on life and property, past occurrences (and future probability) of the hazard, and associated risk assessment information.

3.1.4 Hazard Ranking

The 12 identified natural hazards were ranked according to relative risk to:

- Provide information to County and Municipal Working Groups about the potential impacts from the identified hazards across the region
- Reflect hazard and risk perceptions at the local level

An objective process was used to rank the 12 hazards relative to each other on a regional basis. In addition, the Municipal Working Group ranked these hazards during their respective Work Sessions.¹ The Municipal Appendices include the individual hazard ranking results for each participating municipality. However, those results are also used in Annex D to compare with the results of the objective region-wide analysis.

FEMA guidance documents, including *Local Mitigation Plan Review Guide* (October 1, 2011) and the *State and Local Mitigation Planning how to Guides* (FEMA Publication Series 386-1 through 386-9) provide no specific directive related to quantifying which hazards are determined to be of greatest concern for local hazard mitigation plans. As part of developing a Plan or Plan update there are typically two methods for prioritizing and ranking hazards. One approach is to develop a ranking based on a review of the information contained within the hazard profiles. The second approach is to use a methodology that results in a quantified scoring system which can be used to rank each hazard numerically.

Both approaches were used for the NJ4 HMP update. Annexes D.1 through D.12 include rankings based upon the contents of the hazard profiles while the following discussion explains a quantified scoring system used to determine the overall risk from the identified hazards. The results are then compared with more subjective results from the Municipal Working Groups to determine similarities and differences between objective and subjective rankings.

Calculated Prioritized Risk Index (CPRI)

The Planning Team researched various methods for quantifying risks and ranking hazards. After reviewing several possible options, the Calculated Prioritized Risk Index (CPRI) was selected for the NJ4 HMP update. Research revealed that this method has been used in multiple local and State hazard mitigation plans that have been approved by FEMA and subsequently adopted by the jurisdiction or State.

The CPRI methodology applies weighted averages that are based on four sub-categories established in the IFR guidance for hazard profiles. These categories include the description of the hazard, occurrence and future probability, location and extent, and impact on life and property. Using information collected regarding these four components, the CPRI establishes a weighted score calculated from the following four component indices.

- Probability of occurrence (P), weighted at 0.45 or 45%
- Severity of impacts (I), weighted at 0.30 or 30%
- Warning time before hazard onset (W), weighted at 0.15 or 15%
- Duration of the hazard exposure (D), weighted at 0.10 or 10%

¹ See *Section 2: Planning Process* for a description of the Municipal Working Groups and the Working Sessions conducted for the NJ4 HMP.

Section 3: Hazard Identification and Risk Assessment

As part of completing the hazard profiles for the 12 identified hazards, a value of 1 – 4 was assigned to each of the four components listed above for each hazard. Then, the following formula for calculating the CPRI was used:

$$CPRI = (0.45 \times P) + (0.30 \times I) + (0.15 \times W) + (0.10 \times D)$$

This weighting emphasizes two important variables used to define risk: the probability of occurrence and the severity of impacts. It also allows for the influences of warning time (which provides an opportunity to prepare) and duration (which delays recovery). The weighting of the four categories (distribution of percentages) shown in the calculation above were the defaults utilized in other CPRI mitigation planning documents which were researched as part of identifying a prioritizing scoring system for hazards profiled.

The following tables (Tables RP.3-3 through RP.3-6) were used to determine the selected index value for each of the four component indices of the CPRI. “Descriptions” in these four tables identify hazard conditions, impacts, or consequences corresponding to the different index values. Any one of the described conditions, impacts, or consequences is considered sufficient for the index value to be assigned to a particular hazard.

Table RP.3-3: CPRI Probability of Future Occurrence Based on Previous Hazard Events

Probability	Index Value	Description
Highly Likely	4	<ul style="list-style-type: none">• Frequent significant events with a well documented history of occurrence.• Event has up to 1 in 1 year chance of occurring. (1/1 = 100%)• History of events indicates a 33%-100% likelihood per year.
Likely	3	<ul style="list-style-type: none">• Occasional significant occurrences with at least two or more documented historic significant events.• Event has up to 1 in 3 years chance of occurring. (1/3 = 33%)• History of events indicates a 20%-33% likelihood per year.
Possibly	2	<ul style="list-style-type: none">• Rare significant occurrences with at least one documented or anecdotal historic significant event• Event has up to 1 in 5 years chance of occurring. (1/5=20%)• History of events indicates a 10%-20% likelihood per year.
Unlikely	1	<ul style="list-style-type: none">• Extremely rare with no documented history of significant events occurring.• Event has up to 1 in 10 years chance of occurring. (1/10=10%)• History of events indicates a 0%-10% likelihood per year.

Table RP.3-4: CPRI Magnitude/Severity of Potential Impacts Based on Previous Hazard Events

Magnitude/Severity	Index Value	Description
Catastrophic	4	<ul style="list-style-type: none">• Multiple deaths• More than 50% of property is severely damaged• Complete shutdown of facilities for more than 1 month
Critical	3	<ul style="list-style-type: none">• Injuries and/or illnesses result in permanent disability• More than 25% of property is severely damaged• Complete shutdown of critical facilities for at least 14 days
Limited	2	<ul style="list-style-type: none">• Injuries and/or illnesses do not result in permanent disability• More than 10% of property is severely damaged• Complete shutdown of critical facilities for at least 1 day
Negligible	1	<ul style="list-style-type: none">• Injuries and/or illnesses are treatable with first aid• Less than 25% of property is severely damaged• Shutdown of critical facilities for 24 hours or less

Section 3: Hazard Identification and Risk Assessment

Table RP.3-5: CPRI Warning Time of Hazard Event Based on Hazard Definition

Warning Time	Index Value	Description
Less than 6 Hours	4	Less than 6 Hours warning time before event occurs
6-12 Hours	3	6-12 Hours warning time before event occurs
12-24 hours	2	12-24 Hours warning time before event occurs
24+ Hours	1	At least 24 Hours warning time before event occurs

Table RP.3-6: CPRI Duration of Hazard Event Based on Hazard Definition

Duration	Index Value	Description
More than 1 week	4	Event lasts more than 1 week
Less than 1 week	3	Event lasts less than 1 week
Less than 1 day	2	Event lasts less than 1 day
Less than 6 hours	1	Event lasts less than 6 hours

Data from the hazard profiles were used to calculate the probability and severity based on the descriptions included in Tables RP.3-3 and RP.3-4 above. The hazard profiles provide information related to the frequency of past events and impacts on life and property. As part of determining the probability and severity, a second verification used geographic spatial data (for hazards where available) to independently validate the index values obtained from historic data. To complement the historic datasets, generalized Geographic Information System (GIS) data layers that depict the spatial distribution of risk for the hazard were used where available. These GIS datasets included contours that depict potential earthquake risk, extreme wind speed zones, and flood hazard data (in the form of polygons) including effective Digital Flood Insurance Rate Map (DFIRM), Preliminary Flood Insurance Rate Map (PFIRM), and Preliminary Work Map (PWM) data.

The Warning Time and Duration tables (Tables RP.3-5 and RP.3-6) were used as a guide to assign index values for each of the 12 hazards. Recognizing that a range of values can be assigned for both these categories, values were selected that would be considered average for a significant event. For example, a *significant* flood event typically last more than one week (Index Value = 4) with flood stage predictions (warning times) from agencies such as the NWS or the United States Geologic Survey (USGS) of at least 24 hours (Index Value = 1).

Applying the CPRI calculation results in a risk value between 1 and 4 for each hazard. The higher the score, the higher the overall relative risk associated with the hazard. Table RP.3-7 below identifies the results of applying the CPRI methodology for the 12 hazards selected for NJ4 HMP Plan update. The hazards are ordered by the CPRI results.

Section 3: Hazard Identification and Risk Assessment

Table RP.3-7: CPRI Regional Results

Hazard	Probability	Magnitude / Severity	Warning Time	Duration	CPRI Score	CPRI Rank
Flood	4	3	1	4	3.25	1
High Wind	4	2	3	1	2.95	2
Wildfire	3	1	4	3	2.55	3
Extreme Temperature	3	2	1	3	2.4	4
Severe Weather - Winter	3	2	1	3	2.4	4
Coastal Erosion and Sea-Level Rise	2	3	1	4	2.35	6
Dam Failure	1	4	4	1	2.35	6
Levee Failure	1	4	4	1	2.35	6
Earthquakes	1	3	4	3	2.25	9
Severe Weather - Summer	3	1	3	1	2.2	10
Drought	3	1	1	4	2.2	10
Geological Hazards	1	2	4	1	1.75	12

Municipal Hazard Rankings

During the Municipal Working Group Work Sessions, each participating municipality ranked the 12 hazards as high (H), medium (M), low (L), or not applicable (N/A). The hazards were ranked based on the experience and expertise of the Municipal Working Group members regarding the overall impact to the jurisdiction considering such factors as how often the hazard occurred, amount of property and infrastructure damages, number of people impacted, and time of recovery.

Hazards ranked as “N/A” by the Municipal Working Groups are those that do not apply to the municipality. For example, far inland municipalities are not impacted by the Coastal Erosion and Sea Level Rise hazard and therefore these municipalities identified the hazard as N/A.

The hazard ranking results are shown in Tables RP.3-8 through RP.3-11. In addition, the individual municipality hazard ranking results have been mapped for each hazard and are presented as part of the hazard risk assessments in Annexes D.1 through D.12.

Section 3: Hazard Identification and Risk Assessment

Table RP.3-8: Municipal Working Group Hazard Ranking Results – Camden County

County/Municipality	Coastal Erosion & Sea Level Rise	Dam Failure	Drought	Earthquake	Extreme Temperature	Flood	Geologic Hazards	High Wind	Levee Failure	Severe Weather - Summer	Severe Weather - Winter	Wildfire
Camden County												
Audubon Borough	N/A	L	L	L	L	L	L	H	N/A	H	M	L
Barrington Borough	N/A	L	L	L	L	H	N/A	M	N/A	M	M	L
Bellmawr Borough	N/A	N/A	L	L	L	H	N/A	M	L	M	M	L
Berlin Borough	N/A	H	L	L	M	H	L	H	N/A	H	H	L
Brooklawn Borough	H	N/A	L	L	L	H	L	M	N/A	M	M	L
Camden City	H	H	M	L	M	H	L	M	L	M	M	L
Cherry Hill Township	L	H	L	L	M	M	N/A	M	N/A	M	M	M
Chesilhurst Borough	N/A	N/A	L	L	M	L	L	M	N/A	M	H	H
Collingswood Borough	L	N/A	L	L	L	H	N/A	M	L	L	H	N/A
Gibbsboro Borough	N/A	H	L	L	M	M	N/A	M	N/A	M	M	M
Gloucester City	H	N/A	M	L	H	H	M	H	N/A	M	H	L
Gloucester Township	N/A	M	L	L	L	M	L	M	N/A	M	M	L
Haddon Heights Borough	N/A	L	N/A	L	L	M	N/A	H	N/A	L	H	N/A
Hi-Nella Borough	N/A	N/A	L	L	L	H	L	M	N/A	L	M	L
Laurel Springs	N/A	L	L	L	L	M	L	H	N/A	H	H	L
Lawnside Borough	N/A	N/A	L	L	L	L	L	M	N/A	L	L	M
Lindenwold Borough	N/A	M	L	L	L	M	L	M	L	L	M	L
Magnolia Borough	N/A	N/A	L	L	M	M	L	M	N/A	H	M	L
Merchantville Borough	N/A	N/A	L	L	L	M	L	M	N/A	M	M	L
Mount Ephraim Borough	L	L	L	L	M	H	L	M	N/A	M	M	L
Pennsauken Township	L	L	L	L	L	H	L	M	N/A	M	M	L
Pine Hill Borough	N/A	L	M	L	M	L	L	M	N/A	M	M	H
Pine Valley Borough	N/A	L	M	L	M	L	L	M	N/A	M	M	H
Runnemede Borough	N/A	H	L	L	H	H	N/A	M	N/A	H	H	L
Somerdale Borough	N/A	L	L	L	M	M	L	M	N/A	M	M	L
Stratford Borough	N/A	L	L	L	L	L	L	H	N/A	H	H	L
Voorhees Township	N/A	L	L	L	L	L	L	M	N/A	L	L	L
Waterford Township	N/A	M	H	L	L	L	L	M	N/A	L	L	H
Winslow Township	N/A	L	L	L	M	H	M	H	N/A	M	M	H

Section 3: Hazard Identification and Risk Assessment

Table RP.3-9: Municipal Working Group Hazard Ranking Results – Gloucester County

County/Municipality	Coastal Erosion & Sea Level Rise	Dam Failure	Drought	Earthquake	Extreme Temperature	Flood	Geologic Hazards	High Wind	Levee Failure	Severe Weather - Summer	Severe - Weather - Winter	Wildfire
Gloucester County												
Clayton Borough	N/A	M	M	L	M	H	N/A	M	N/A	M	M	M
Deptford Township	N/A	M	L	L	M	H	N/A	M	N/A	H	H	L
Elk Township	N/A	M	M	L	M	L	N/A	M	N/A	M	M	L
East Greenwich Township	N/A	N/A	H	L	M	H	N/A	M	L	M	M	N/A
Franklin Township	N/A	M	L	L	L	M	N/A	M	N/A	M	M	H
Glassboro Borough	N/A	H	L	M	M	H	N/A	H	N/A	L	L	M
Greenwich Township	L	L	L	L	M	H	N/A	L	M	M	M	L
Harrison Township	N/A	M	L	L	L	H	L	H	N/A	H	L	N/A
Logan Township	M	N/A	L	L	L	M	N/A	H	M	L	L	N/A
Mantua Township	N/A	L	L	L	L	M	N/A	M	L	L	L	L
Monroe Township	N/A	H	M	L	M	H	N/A	H	N/A	H	H	H
National Park Borough	M	N/A	L	L	M	H	N/A	M	N/A	L	L	L
Newfield Borough	N/A	N/A	L	L	L	M	N/A	M	N/A	L	M	L
Paulsboro Borough	L	N/A	N/A	M	M	H	N/A	H	H	L	M	L
Pitman Borough	N/A	L	L	L	L	H	N/A	H	N/A	H	M	L
South Harrison Township	N/A	L	H	L	M	M	N/A	H	N/A	H	H	L
Swedesboro Borough	N/A	M	N/A	L	L	L	N/A	M	N/A	M	M	N/A
Washington Township	N/A	M	L	L	L	M	N/A	M	N/A	M	M	L
Wenonah Borough	N/A	M	L	L	L	M	N/A	M	N/A	L	L	L
West Deptford Township	L	L	L	L	L	H	N/A	L	L	L	M	L
Westville Borough	H	L	L	M	M	H	N/A	M	L	H	M	L
Woodbury City	N/A	M	L	L	M	M	N/A	H	L	M	M	N/A
Woodbury Heights Borough	N/A	L	L	L	L	M	N/A	M	N/A	M	M	L
Woolwich Township	N/A	H	M	L	L	M	N/A	M	N/A	M	M	L
Rowan University	M	L	N/A	M	L	H	N/A	H	N/A	L	L	N/A

Section 3: Hazard Identification and Risk Assessment

Table RP.3-10: Municipal Working Group Hazard Ranking Results – Salem County

County/Municipality	Coastal Erosion & Sea Level Rise	Dam Failure	Drought	Earthquake	Extreme Temperature	Flood	Geologic Hazards	High Wind	Levee Failure	Severe Weather - Summer	Severe - Weather - Winter	Wildfire
Salem County												
Alloway Township	N/A	M	L	L	L	L	N/A	M	L	L	M	H
Carneys Point Township	H	H	M	L	L	H	N/A	H	H	L	L	L
Elmer Borough	N/A	L	N/A	L	L	L	L	H	N/A	L	M	N/A
Elsinboro Township	H	N/A	L	L	L	H	N/A	H	H	L	L	M
Lower Alloways Creek Township	L	L	L	L	L	M	N/A	L	H	L	L	L
Mannington Township	L	L	L	L	L	H	N/A	M	L	M	H	L
Oldmans Township	M	H	L	L	L	H	N/A	H	M	M	M	L
Penns Grove Borough	H	L	L	L	L	H	N/A	H	H	L	L	L
Pennsville Township	M	M	L	L	M	H	N/A	H	H	M	M	L
Pilesgrove Township	N/A	H	L	L	L	M	N/A	M	N/A	M	L	N/A
Pittsgrove Township	N/A	M	L	L	L	M	N/A	M	N/A	L	L	L
Quinton Township	L	M	L	L	L	H	N/A	M	N/A	M	M	M
Salem City	M	N/A	L	M	M	H	N/A	H	H	L	M	L
Upper Pittsgrove Township	N/A	L	L	L	L	L	N/A	M	N/A	M	M	L
Woodstown Borough	N/A	L	L	L	L	H	N/A	M	N/A	L	L	N/A

Section 3: Hazard Identification and Risk Assessment

Table RP.3-11: Municipal Working Group Hazard Ranking Results – Cumberland County

County/Municipality	Coastal Erosion & Sea Level Rise	Dam Failure	Drought	Earthquake	Extreme Temperature	Flood	Geologic Hazards	High Wind	Levee Failure	Severe Weather - Summer	Severe - Weather - Winter	Wildfire
Cumberland County												
Bridgeton City	L	L	L	M	L	L	N/A	H	N/A	L	M	N/A
Commercial Township	M	M	L	L	L	H	N/A	M	H	L	L	H
Deerfield Township	N/A	N/A	L	L	M	M	N/A	M	N/A	M	M	L
Downe Township	H	N/A	L	L	M	H	L	H	L	M	M	L
Fairfield Township	H	H	H	L	H	H	N/A	M	N/A	H	H	H
Greenwich Township	H	H	L	L	L	H	N/A	H	H	L	M	L
Hopewell Township	N/A	L	L	L	L	M	N/A	M	L	M	L	L
Lawrence Township	H	M	L	L	L	M	N/A	M	M	M	L	H
Maurice River Township	H	M	L	M	M	H	N/A	H	H	M	M	H
Millville City	M	H	L	L	M	H	N/A	H	N/A	M	M	L
Shiloh Borough	N/A	N/A	L	L	M	L	N/A	M	N/A	M	M	L
Stow Creek Township	L	L	H	L	L	L	N/A	H	N/A	M	M	L
Upper Deerfield Township	N/A	L	M	L	M	L	N/A	M	N/A	M	M	L
Vineland City	N/A	M	M	M	H	M	N/A	H	N/A	M	H	M

Section 3: Hazard Identification and Risk Assessment

Comparison of CPRI and Municipal Hazard Rankings

The results from the CPRI and the Municipal Hazard Rankings were compared to identify similarities and differences in how the hazards were ranked by each method. Converting the high, medium, and low rankings to 3, 2, and 1 scores, respectively and then computing the average for each hazard across all the participating municipalities quantified the Municipal Hazard Rankings. Hazards ranked as “not applicable” were quantified as zero.

Table RP.3-12 below compares the results from the two methods.

Table RP.3-12: CPRI Compared to Average Municipal Hazard Rankings

Hazard	CPRI Rank	Municipal Hazard Rank (average score)
Flood	1	2 (2.28)
High Wind	2	1 (2.33)
Wildfire	3	7 (1.24)
Extreme Temperature	4	5 (1.47)
Severe Weather - Winter	4	3 (1.93)
Coastal Erosion and Sea-Level Rise	6	10 (0.77)
Dam Failure	6	6 (1.35)
Levee Failure	6	11 (0.61)
Earthquakes	9	9 (1.10)
Severe Weather - Summer	10	4 (1.82)
Drought	10	8 (1.19)
Geological Hazards	12	12 (0.33)

Most of the hazards were ranked similarly by both methods including Dam Failure, Drought, Earthquakes, Extreme Temperatures, Flood, High Winds, Geologic Hazards, and Severe Weather - Winter. Four of the hazards showed very different results including Coastal Erosion and Sea Level Rise, Levee Failure, Severe Weather – Summer, and Wildfire. For example, the Severe Weather – Summer hazard was ranked 4th by the municipalities’ hazard rankings and 10th using the CPRI method.

These differences are attributed to the following:

- The CPRI examines the potential for risk based on the criteria explained earlier in this section. The actual or perceived risk by the individual municipalities may be higher or lower than what was calculated by the CPRI.
- The potential that Municipal Working Groups misinterpreted the sub-hazards that make up the hazard. For example the Severe Weather – Summer hazard only included hail and lightning which resulted in a relatively low ranking from the CPRI versus a relatively high (4th) by the Municipal Working Groups. The participants may have had difficulty separating other effects of severe summer storms that are accounted for in other hazards (e.g., high winds).
- Limited exposure to the hazard. Although there may be a moderate to high risk from a particular hazard, the Municipal Working Groups may have underestimated the risk due to little or no past personal experience or unfamiliarity with available data. This is particularly true for the Sea-Level Rise portion of the Coastal Erosion and Sea Level Rise hazard that has a moderate to high risk particularly for coastal communities but may have yet to be fully recognized by the participants.

3.2 Hazard Profiles and Risk Assessments

Hazard mitigation planning provides a rational method for communities to decide what actions to take to reduce their risks from natural hazards. In addition to determining and implementing specific mitigation measures, another important result of a mitigation plan is the risk assessment, which establishes an objective basis for setting priorities moving forward.

The NJ4 HMP risk assessment has been used to identify the natural hazards that present the most potential damage to the region, counties, municipalities, and their assets; to ascertain where additional study may be warranted; and to continue identification and prioritization of mitigation measures, building on those included in the SDVR HMPs.

The risk assessment approach included objectively determining the relative risk to municipalities based on the best available data for each hazard and comparing those results with more subjective rankings of the same hazards identified by Municipal Working Groups. This approach was taken intentionally to:

- Provide validation for the objective hazard identification and risk assessment results – in most cases, the objective hazard rankings were consistent with the subjective hazard ranking developed independently by the Municipal Working Groups
- Produce hazard and risk information for use by County and Municipal Working Groups during the implementation of the NJ4 HMP including public outreach and education, site and facility evaluations, and development of project scoping documents

Annex D: Hazard Profiles and Risk Assessments provides detailed profiles for each of the 12 natural hazards included in the NJ4 HMP including:

- Description of the hazard
- Location and extent of the hazard
- Severity of the hazard
- Impact on life and property
- Past occurrences (and probability) of the hazard
- Associated risk assessment information

Section 3.2: Hazard Profiles and Risk Assessments provides a summary of the Annex D results for each of the 12 hazards included in the NJ4 HMP. In addition, *Section 4.3: County and Municipal Mitigation Measures* of the Regional HMP outlines a corresponding series of general recommendations that can be implemented on a county-wide basis as well as summarizing a wide range of specific, prioritized actions that individual municipalities have developed as part of the planning process that addresses these hazard assessment results.¹

¹ See *Part 4.3: County / Municipal Mitigation Measures* in the Appendices for a detailed list of mitigation measures for each of the participating municipalities.

3.2.1 Coastal Erosion and Sea Level Rise

The following summarizes results of the hazard identification and risk assessment process for Coastal Erosion and Sea Level Rise as detailed in Annex D.1.

Coastal Erosion:

- Between 1990 and 2014, there were 12 major events that resulted in coastal erosion in the NJ4 HMP region. This results in roughly one event every two years (or 54% annual probability), indicating municipalities with shorelines on the Delaware Bay and Delaware River will continue to be vulnerable to coastal erosion.
- The risk assessment for Coastal Erosion identified housing units and population within census blocks intersecting the shoreline areas and tributaries of the Delaware Bay and Delaware River in Cumberland, Gloucester, and Salem Counties.
- 314 census blocks within 20 municipalities were identified. Table RP.3-13 shows that as of 2010, 3,385 housing units and 6,767 residents were located in these potentially vulnerable coastal census blocks. This represents 0.85% of housing units and 0.66% of population in the NJ4 HMP region.

Sea Level Rise:

- Due to projections of continuing Sea Level Rise, municipalities adjacent to the Delaware Bay, Delaware River, and tributaries are, and will increasingly be, vulnerable to periodic inundation.
- The risk assessment for Sea Level Rise identified parcels with a centroid (plus an additional buffer of 100 feet) within increased inundation zones of 1, 2, and 3 feet above the Base Flood Elevation (BFE).
- These increased inundation zones involve a significant amount of land in the coastal municipalities. Table RP.3-13 shows that as sea levels rise along the Delaware Bay and Delaware River, the number of parcels at risk from the 1% annual chance flood in Cumberland and Salem Counties will increase by 10,706 from the current total of 11,675 to 22,381 with a one foot increase to BFE, and by 13,378 to a total of 25,053 parcels with an increase of three feet to the BFE.

Summary risk assessment results for Coastal Erosion and Sea Level Rise are shown in Table RP.3-13 (including information excerpted from Annex D.1).

Table RP.3-13: Summary of Risk from Coastal Erosion and Sea Level Rise

(Source: US Census Bureau, 2010 Census, New Jersey Geographic Information Network (NJGIN), February 2014)

County	Coastal Erosion Risk		Sea Level Rise (Base Flood Elevation+ 1, 2 and 3 Feet)		
	Coastal Housing Units (2010)	Coastal Population (2010)	BFE + 1: Parcels at Risk	BFE + 2: Parcels at Risk	BFE + 3: Parcels at Risk
Camden	99	111	not available	not available	not available
Gloucester	691	1,105	not available	not available	not available
Salem	581	849	7,427	8,414	9,225
Cumberland	2,014	4,702	3,279	3,751	4,153
Grand Total	3,385	6,767	10,706	12,165	13,378

With very few exceptions, the objective risk assessment results for Coastal Erosion and Sea Level Rise correspond to the perceptions and subjective opinions of the NJ4 HMP Municipal Working Groups.

3.2.2 Dam Failure

The following summarizes results of the hazard identification and risk assessment process for Dam Failure as detailed in Annex D.2.

- New Jersey Department of Environmental Protection (NJDEP) indicated there were a total of 201 dams in the NJ4 HMP region as of Summer 2014. Nine of these dams are currently classified as “high hazard” dams.
- There have been seven previous dam failures in the NJ4 HMP region between 1999 and 2014. This equates to a significant dam failure event on average slightly more than once every two years.
- The risk assessment for dam failure assigned and tallied scores for each municipality based on dam classifications. Municipalities ranked high were concentrated in the central and northeastern part of the region. The municipalities considered to have the highest risk are shown in Table RP. 3-14.

Table RP.3-14: Highest Ranked Municipalities regarding Dam Failure

Municipality	County	Number of Dams	Combined Classification Score
Gloucester Township	Camden	12	16
Winslow Township	Camden	11	16
Voorhees Township	Camden	13	15
Pittsgrove Township	Salem	7	14

With some exceptions, the objective risk assessment results for Dam Failure correspond to the perceptions and subjective opinions of the NJ4 HMP Municipal Working Groups. Differences result from factors including increased perception of safety due to recent repairs and renovations to several dams.

- The dam failure risk assessment also included assessing assets within the inundation zones (or stream buffer when inundation data was unavailable) for the nine high hazard dams.
- Population and housing units were identified within census blocks intersecting the inundation zone or buffer downstream of each dam. Table RP.3-15 (based on Annex D.2) shows that of the nine high hazard dams, Union Lake Dam in Millville City had the highest population (4,033 residents) and number of housing units (1,849) at risk.

Table RP.3-15: High Hazard Potential Dam Summary Risk Assessment

Dam Name	Inundation Zone Source	Municipality	County	Population	Housing Units
Union Lake Dam	NJDEP	Millville City	Cumberland	4,033	1,849
Sunset Lake Dam	NJDEP	Bridgeton City	Cumberland	2,711	1,027
Clementon Lake Dam	NJDEP	Clementon Borough	Camden	1,847	814
Sunset Lake Raceway Dam	Stream buffer	Bridgeton City	Cumberland	1,514	416
Wadsworth Lake Dam	Stream buffer	Glassboro Borough	Gloucester	1,240	750
Lake Gilman Dam	Stream buffer	Elk Township	Gloucester	837	262
Franklinville Lake Dam	NJDEP	Franklin Township	Gloucester	462	191
Elkinton Pond Dam	Stream buffer	Quinton Township	Salem	227	85
East Lake Dam	NJDEP	Bridgeton City	Cumberland	224	76

3.2.3 Drought

The following summarizes results of the hazard identification and risk assessment process for Drought as detailed in Annex D.3.

- According to the Northeast Regional Climate Center there have been 10 significant drought events in the NJ4 HMP region between 1930 and 2013. As a result, the NJ4 HMP region experiences a significant drought event on average slightly more than once every eight years.
- The exposure of people and structures to the effects of drought is essentially equal throughout the NJ4 HMP region.
- The risk assessment for drought was completed by determining the percentage of the total land area vulnerable to drought based on the amount of agricultural land acreage in each municipality.
- Most of the municipalities with the highest agricultural land area are located in the central part of the NJ4 HMP region including south-central Gloucester County, northern and eastern Salem County, and western Cumberland County.
- The results of the land area analysis indicate Upper Pittsgrove Township has the highest number of agricultural acres in the NJ4 HMP region with 15,667 acres (or 24.48 square miles and the fourth highest percentage of municipality land area within the agriculture category (60.70%). The top 10 municipalities with the highest percent of agricultural land area are shown in Table RP.3-16 (excerpted from Annex D.3).

Table RP. 3-16: Top 10 Municipalities with the Highest Percent of Agricultural Land Area

(Source: NJDEP, Land Use Land Cover, 2007)

Municipality	County	Land Area (Sq. Miles)	Agricultural Land Area (Sq. Miles)	Agricultural Land Area (Acres)	% of Municipality Total
Shiloh Borough	Cumberland	1.21	0.94	604	77.93%
Pilesgrove Township	Salem	34.84	22.52	14,414	64.65%
Hopewell Township	Cumberland	29.87	18.94	12,122	63.41%
Upper Pittsgrove Township	Salem	40.33	24.48	15,667	60.70%
Mannington Township	Salem	33.70	20.30	12,991	60.23%
Upper Deerfield Township	Cumberland	31.10	18.38	11,766	59.11%
Stow Creek Township	Cumberland	18.30	10.24	6,555	55.96%
South Harrison Township	Gloucester	15.68	7.61	4,872	48.55%
Woolwich Township	Gloucester	20.91	9.05	5,793	43.29%
Deerfield Township	Cumberland	16.76	7.07	4,523	42.16%

With some exceptions, the objective risk assessment results for Drought correspond to the perceptions and subjective opinions of the NJ4 HMP Municipal Working Groups. Differences result from factors including lack of substantial damages from drought during the life experience of Municipal Working Group members.

- As development continues in more rural parts of the NJ4 HMP region, the demand for water supply will increase as well. New development in these regions relying on groundwater wells, could increase the vulnerability to drought events, in terms of water supply.

3.2.4 Earthquake

The following summarizes results of the hazard identification and risk assessment process for Earthquake as detailed in Annex D.4.

- Data from the 2014 USGS National Seismic Hazard Map indicates the earthquake risk in southern New Jersey is relatively low compared to northern New Jersey or other areas of the east coast.
- Earthquake data from the New Jersey Geological and Water Survey (NJGWS) indicates there have been 11 earthquakes with epicenters in the NJ4 HMP region between 1939 and June 2014. This equates to an earthquake event on average approximately every seven years.
- The exposure of people and structures to the effects of earthquakes is essentially equal throughout the NJ4 HMP region.
- The risk assessment for earthquake identified areas in the region with older structures as well as more densely populated areas. Relative risk was identified by ranking the earthquake risk for each municipality as high, medium or low based on a combination of the 2010 census data (census blocks) and building permit data between the early 1900s and 2010.
- The highest risk is located in parts of central and western Camden County that has both a high population density and older building stock. Tables RP.3-17 and RP.3-18 (based on information used in Annex D.4) identify the top five municipalities with the highest ranking based on population per square mile and building permits respectively.

Table RP.3-17: Municipalities With the Highest Earthquake Ranking Based on Population Per Square Mile

Municipality	County	Population Per Square Mile	Overall Hazard Ranking
Woodlynne Borough	Camden	13,536	High
Camden City	Camden	7,394	High
Collingswood Borough	Camden	7,216	High
Merchantville Borough	Camden	6,476	High
Audubon Park Borough	Camden	6,394	High

Table RP.3-18: Municipalities With the Highest Earthquake Ranking Based on Building Permits

Municipality	County	% of Building Permits Prior to 1975	Overall Hazard Ranking
Brooklawn Borough	Camden	97.19%	High
Woodlynne Borough	Camden	95.43%	High
Haddon Heights Borough	Camden	94.85%	High
Audubon Park Borough	Camden	94.53%	High
Elmer Borough	Salem	92.77%	High

The objective risk assessment results for Earthquake differed from the perceptions and subjective opinions of several of the NJ4 HMP Municipal Working Groups. Differences result from factors including lack of substantial damages from earthquake during the life experience of Municipal Working Group members.

3.2.5 Extreme Temperature

The following summarizes results of the hazard identification and risk assessment process for Extreme Temperature as detailed in Annex D.5.

- The NCDC database indicates there have been 25 recorded Extreme Heat and Extreme Cold/Wind events in the region during the period between 2001 and June 2014. As a result, extreme temperature events are anticipated to continue to occur in the NJ4 HMP region a couple of times per year.
- The exposure of people and structures to the effects of extreme temperatures is essentially equal throughout the NJ4 HMP region.
- The risk assessment identified municipalities with higher percentages of vulnerable populations (older than 65 and younger than 18) and lower median household incomes using data from the 2010 US Census.
- The municipalities ranked high are about evenly distributed across the NJ4 HMP region with several concentrated in northwestern Camden County and central Cumberland County. Table RP.3-19 (based on information used in Annex D.5) shows the 10 municipalities with the highest overall hazard ranking.

Table RP.3-19: Municipalities With the Highest Overall Ranking Based on Vulnerable Populations and Household Incomes

Municipality	County	Overall Numeric Ranking	Overall Hazard Ranking
Gloucester City	Camden	8	High
Lawnside Borough	Camden	8	High
Millville City	Cumberland	8	High
Salem City	Cumberland	8	High
Upper Deerfield Township	Cumberland	8	High
Vineland City	Cumberland	8	High
Audubon Park Borough	Camden	7	High
Barrington Borough	Camden	7	High
Bellmawr Borough	Camden	7	High
Berlin Borough	Camden	7	High

The objective risk assessment results for Extreme Temperature differed from the perceptions and subjective opinions of several of the NJ4 HMP Municipal Working Groups. Differences result from factors including lack of awareness by the Municipal Working Group members regarding relative numbers of vulnerable constituents and differences in income levels within the communities.

3.2.6 Flood

The following summarizes results of the hazard identification and risk assessment process for Flood as detailed in Annex D.6. The risk assessment accounts for flooding along the major rivers and bodies of water in the region such as the Delaware Bay and Delaware River and its tributaries and also addresses risk from storm surge.

- The NCDC database indicates there have been 108 flood events in the region in the period from 1996 to 2014, an average of roughly six flood events per year.
- The risk assessment analyzed FEMA NFIP claims including calculating future loss estimates from repetitive loss (RL) and severe repetitive loss (SRL) claims and analyzing available FEMA non-regulatory products available within the NJ4 HMP region.
- As of August 2014 the NJ4 HMP region had 312 RL and 13 SRL properties, which accounts for only about 2% of the total RL and SRL properties in the state of New Jersey. The projected 1% annual chance flood risk to the repetitive loss properties was calculated at \$5,929,269.
- Municipalities also were ranked based on parcel data and the percentage of parcels in the special flood hazard area (SFHA), or area of 1% annual chance flooding from the PFIRMs. The regional storm surge analysis included calculating the land area, estimated population, and number of critical facilities located within inundation zone Categories 1 - 4 for each of the four counties.
- The results of the parcel analysis found that municipalities with the highest percentage of parcels in the 1% annual chance flood area are predominately located along or in close proximity to the Delaware Bay and Delaware River. The ten municipalities with the highest number of parcels in the floodplain are summarized in Table RP.3-20 (excerpted from Annex D.6). The parcel analysis indicated that Downe Township in Cumberland County had 66.21% (1,405 parcels) of its total parcels located within the 1% annual chance flood area, the highest percentage in the NJ4 HMP region.

Table RP.3-20: Top Ten Municipalities Based on the Percent of Parcels in the SFHA, Ordered by Percentage of Parcels

(Sources: FEMA Map Service Center - PFIRM, US Census, NJGIN - Parcel Data, February, 2014, NFIP Policy and Claims Statistics, December, 2014)

Municipality	Land Area (Sq. Miles)	Area in SFHA (Sq. Miles)	Total # of Parcels	# of Parcels in SFHA	% of Total Parcels in SFHA	NFIP Policies in Force
Downe Township	48.61	34.60	2,122	1,405	66.21%	247
Elsinboro Township	11.92	11.06	715	377	52.73%	92
Pennsville Township	21.28	15.22	6,509	3,263	50.13%	939
Greenwich Township	8.97	9.01	2,662	989	37.15%	373
Lower Alloways Creek	45.23	30.35	1,254	389	31.02%	83
Carneys Point Township	16.86	5.60	3,527	861	24.41%	411
Penns Grove Borough	0.91	0.28	1,835	424	23.11%	180
Salem City	2.34	1.49	2,310	512	22.16%	272
Woodlynne Borough	0.22	0.07	990	216	21.82%	73
National Park Borough	1.00	0.51	2,498	515	20.62%	89

There were no municipalities where the objective results of the hazard identification and risk assessment for flood differed significantly from the perceptions of the Municipal Working Groups.

3.2.7 Geologic Hazards

The following summarizes results of the hazard identification and risk assessment process for Geologic Hazards as detailed in Annex D.7. Geologic hazards include landslides, subsidence, and sinkholes.

- As of June 2014, the NJGWS indicated there has been one landslide event in the NJ4 HMP region since 1950. There have also been no reports of prior sinkholes or land subsidence in the NJ4 HMP region.
- The risk assessment identified areas with susceptibility to landslides. A parcel analysis was completed for this hazard zone. The results are summarized in Table RP.3-21.

Table RP.3-21: Top Five Municipalities with the Highest Number of Parcels in the Moderate Susceptibility / Low Incidence Landslide Zone
(Sources: US Geological Survey, Godt, 2001)

Municipality	County	Land Area (Sq. Miles)	Total # of Parcels in Municipality	# of Parcels in Moderate Susceptibility / Low Incidence
Camden City	Camden	8.92	28,228	27,558
Pennsauken Township	Camden	10.44	12,977	12,686
Gloucester City	Camden	2.32	6,759	3,336
Carneys Point Township	Salem	16.86	3,527	2,893
Paulsboro Borough	Gloucester	1.9	2,755	2,616

- The area most susceptible to landslides is concentrated along the western border of Camden, Gloucester, and Salem counties. Gloucester County has 42.6 square miles of land areas within the moderate susceptibility/low incidence class, the highest in the NJ4 HMP region. Camden County has the highest population at risk within the moderate susceptibility/low incidence class. Camden County has 124,476 residents (or 12.14% of the region) located within this class.

The objective risk assessment results for Geologic Hazards differed from the perceptions and subjective opinions of several of the NJ4 HMP Municipal Working Groups. Differences result from factors including lack of substantial damages from geologic hazards during the life experience of Municipal Working Group members.

3.2.8 High Wind

The following summarizes results of the hazard identification and risk assessment process for High Wind as detailed in Annex D.8. High wind includes high speed straight line winds, and high speed winds resulting from thunderstorms, coastal storms (e.g., hurricanes, tropical storms, Nor'easters) and tornados.

- The NCDC database and NOAA's Historic Hurricane Tracks database identifies one hurricane and 10 tropical storm events in the NJ4 HMP region between 1950 and June 2014. Therefore, on average, the NJ4 HMP region experiences a significant high wind event about every six years.
- The NCDC reports a total of 30 tornadoes in the NJ4 HMP region between 1950 and June 2014, which equates to about 0.6 to 0.8 tornado days per year.
- The NCDC indicates there have been 495 significant thunderstorm wind events in the NJ4 HMP region between 1972 and June 2014 resulting in an average of roughly eight severe thunderstorms per year.
- The exposure of people and structures to the effects of extreme temperatures is essentially equal throughout the NJ4 HMP region.
- The risk assessment for high wind identified areas in the NJ4 HMP region with older structures compared to information from the New Jersey Wind Zone map as an indication of risk.
- Areas of the NJ4 HMP region with older building inventory were identified by ranking the high wind risk for each municipality as high, medium, or low based on a combination of the 2010 census data (census blocks) and building permit data. Table RP.3-22 identifies the top five municipalities with the highest ranking based on the percent of building permits issued prior to 1975.

Table RP.3-22: Municipalities With the Highest High Wind Ranking Based on Building Permits

Municipality	County	% of Building Permits Prior to 1975	Overall Hazard Ranking
Brooklawn Borough	Camden	97.19%	High
Woodlynne Borough	Camden	95.43%	High
Haddon Heights Borough	Camden	94.85%	High
Audubon Park Borough	Camden	94.53%	High
Elmer Borough	Salem	92.77%	High

- The New Jersey Wind Zone analysis resulted in 11 municipalities ranked as high. The municipalities were all located along or near the eastern border of the NJ4 HMP region. Combining the wind zone results with the analysis results for older building stocks resulting in 39 municipalities ranked high, predominately located in central and eastern Cumberland County and northwestern Camden County.

There were no municipalities where the objective results of the hazard identification and risk assessment for high wind differed significantly from the perceptions of the Municipal Working Groups.

3.2.9 Levee Failure

The following summarizes results of the hazard identification and risk assessment process for Levee Failure as detailed in Annex D.9.

- There are a total of 63 levees in the NJ4 HMP region. Of the 63 levees, 59 (or 93%) are located in Cumberland and Salem Counties in rural areas with low population densities along or near the Delaware Bay and Delaware River and its tributaries. The Southern Jersey Levee Inventory report indicates that roughly 1,000 structures in the NJ4 HMP region are protected by levees.
- Levees are located in a total of 19 municipalities. Lower Alloways Creek in Cumberland County has the highest number of levees in the NJ4 HMP region with 12 levees. This is followed by Lawrence Township that has a total of 11 levees.
- There have been 14 levee failure events in the NJ4 HMP region between 1933 and 2014. This results in roughly one event every six years, indicating levee failures will most likely continue to occur in the future.
- The risk assessment for levee failure included creating a 1,000 foot buffer around each levee included in the NRCS inventory as well as the Pennsauken levee in Camden County. GIS was then used to identify parcels that intersect with the 1,000 foot buffer around each levee.
- Table RP.3-23 (excerpted from Annex D.8) identifies the ten municipalities with the highest number of parcels located within the buffer. Pennsville Township in Salem County has the highest number of parcels intersecting the 1,000 foot buffer.

Table RP.3-23: Top Ten Municipalities with the Highest Number of Parcels intersecting a 1,000 Foot Levee Buffer, Ordered by # of Parcels

(Sources: NJGIN - Parcel Data, February, 2014, NRCS, South Jersey Levee Inventory, FEMA - DFIRM)

Municipality	County	# of Levees	# of Parcels Intersecting 1,000 Foot Buffer
Pennsville Township	Salem	8	730
Millville City	Cumberland	1	385
Commercial Township	Cumberland	3	267
Lower Alloways Creek Township	Salem	12	220
Salem City	Salem	2	211
West Deptford Township	Gloucester	1	165
Quinton Township	Salem	2	151
Elsinboro Township	Salem	4	114
Lawrence Township	Cumberland	11	98
Mannington Township	Salem	2	56

With few exceptions, the objective risk assessment results for Levee Failure correspond to the perceptions and subjective opinions of the NJ4 HMP Municipal Working Groups.

3.2.10 Severe Weather – Summer

The following summarizes results of the hazard identification and risk assessment process for Severe Weather - Summer as detailed in Annex D.10. Hail and lightning are the two components that make up the Severe Weather (Summer) hazard.

- The NCDC reported 132 hail events in the NJ4 HMP region from the period 1969 through June 2014. There were 49 instances of lightning reported in the NCDC database for the NJ4 HMP region from 1998 to June 2014. With roughly three significant events per year for both hail and lightning there is a 100% annual probability of future events occurring in the NJ4 HMP region.
- The exposure of people and structures to the effects of Severe Weather - Summer is essentially equal throughout the NJ4 HMP region.
- The risk assessment for the hail portion of Severe Weather – Summer determined the percentage of the total land area vulnerable to hail based on the amount of agricultural land acreage in each municipality. The results indicate Shiloh Borough in Cumberland County has the highest percentage of agricultural acres in the NJ4 HMP region with 77.93% (or 0.94 of 1.21 square miles) of its land area within the agriculture category.
- The risk assessment for the lightning portion of Severe Weather – Summer identified the older housing stock in the NJ4 HMP region.
- The results of the municipality agriculture Land Use Land Cover and building permit rankings were integrated into the overall Severe Weather - Summer rankings by municipality based on the combined data. Municipalities ranked high are located in western Cumberland County and central and eastern Salem County. The results of the composite rankings are shown in Table RP.3-24 for the nine municipalities ranked high.

Table RP. 3-24: Municipalities Ranked High Based on Overall Rankings

Municipality	County	Ranking Based on % of Building Permits Prior to 1975 (Lightning)	Ranking Based on % of Agricultural Lands in Municipality (Hail)	Overall Hazard Ranking
Mannington Township	Salem	High	High	High
Oldmans Township	Salem	High	High	High
Shiloh Borough	Cumberland	High	High	High
Alloway Township	Salem	Medium	High	High
Deerfield Township	Cumberland	Medium	High	High
Elmer Borough	Salem	High	Medium	High
Elsinboro Township	Salem	High	Medium	High
Greenwich Township	Cumberland	Medium	High	High
Hopewell Township	Cumberland	Medium	High	High

With few exceptions, the objective risk assessment results for Severe Weather - Summer correspond to the perceptions and subjective opinions of the NJ4 HMP Municipal Working Groups.

3.2.11 Severe Weather – Winter

The following summarizes results of the hazard identification and risk assessment process for Severe Weather - Winter as detailed in Annex D.11. This hazard includes ice storms, snowstorms, and blizzards.

- The NCDC database indicates there have been 102 winter weather events that have impacted the region between 1996 and June 2014, which equates to an average of roughly five to six winter storms per year.
- The exposure of people and structures to the effects of Severe Weather - Winter is essentially equal throughout the NJ4 HMP region.
- The risk assessment for Severe Weather - Winter determined the annual figures for damages, deaths, and injuries for the NJ4 HMP region. The risk assessment also included identifying older housing stock as well as ranking municipalities based on the average seasonal snowfall in the NJ4 HMP region.
- The overall results found that a total of 35 municipalities had an overall ranking of high with the majority of the municipalities ranked high located in western Camden County along with a few other municipalities located in parts of western Salem County and central and western Gloucester County. Table RP.3-25 identifies the top ten municipalities with the highest ranking based on the percent of building permits issued prior to 1975. Due to the high percentage of older building stock, these are most likely the municipalities at greatest risk from the Severe Weather – Winter hazard.

Table RP.3-25: Municipalities With the Highest High Wind Ranking Based on Building Permits

Municipality	County	% of Building Permits Prior to 1975	Overall Hazard Ranking
Brooklawn Borough	Camden	97.19%	High
Woodlynne Borough	Camden	95.43%	High
Haddon Heights Borough	Camden	94.85%	High
Audubon Park Borough	Camden	94.53%	High
Elmer Borough	Salem	92.77%	High
Collingswood Borough	Camden	90.68%	High
Oaklyn Borough	Camden	90.51%	High
Westville Borough	Gloucester	89.83%	High
Paulsboro Borough	Gloucester	89.33%	High
Haddon Township	Camden	89.02%	High

With few exceptions, the objective risk assessment results for Severe Weather - Winter correspond to the perceptions and subjective opinions of the NJ4 HMP Municipal Working Groups.

3.2.12 Wildfire

The following summarizes results of the hazard identification and risk assessment process for Wildfire as detailed in Annex D.12.

- There have been a total of 26 wildfire events in the NJ4 HMP region between 1950 and 2014. As a result, the NJ4 HMP region experiences a wildfire event on average roughly once every two years.
- The potential for wildfires is relatively low in urban areas due to the detection and suppression capabilities that exist. The rural and forested areas in the eastern, southern, and southeastern part of the NJ4 HMP region are at a greater vulnerability than the urban areas.
- The risk assessment identified areas in the NJ4 HMP region with a combination of the extreme fuel hazard and high and medium Wildland-Urban Interface/Intermix (WUI). The risk assessment determined the number of acres in the NJ4 HMP region (and square miles) where these two wildfire risk categories intersect. The results were then used to rank municipalities based on the total amount of intersecting land area in each jurisdiction.
- Gloucester County has the highest number of housing units and population located within the WUI high and medium density interface/intermix. In Gloucester County there are 73,867 people and 27,466 housing units located within these zones.
- Camden County has the highest number of square miles (3.71 square miles) where the extreme fuel hazard and high and medium WUI intersect while Cumberland County has the highest number of parcels (3,103 parcels).
- The results of the analysis show that 53 of 90 municipalities in the NJ4 HMP region had areas where the extreme fuel hazard intersects with the high/medium WUI. The 10 municipalities ranked high are shown in Table RP.3-26 (excerpted from Annex D.12). The table shows that Winslow Township in Camden County has the greatest number of square miles (1.86 square miles) where these two categories intersect.

Table RP.3-26: Municipalities with the Highest Amount of Land Area Intersecting Extreme Wildfire Fuel Hazard Risk and High/Medium Interface (WUI), ordered by Square Miles/Acres

(Source: NJDEP (GIS), New Jersey Forest Fire Service)

Municipality	County	Acres	Square Miles
Winslow Township	Camden	1,196.35	1.86
Millville City	Cumberland	793.04	1.23
Franklin Township	Gloucester	676.32	1.05
Monroe Township	Gloucester	425.62	0.66
Waterford Township	Camden	400.04	0.62
Vineland City	Cumberland	379.59	0.59
Fairfield Township	Cumberland	265.75	0.41
Voorhees Township	Camden	229.33	0.35
Lawrence Township	Cumberland	178.19	0.27
Gloucester Township	Camden	177.79	0.27

The objective risk assessment results for Wildfire differed from the perceptions and subjective opinions of several of the NJ4 HMP Municipal Working Groups. Differences result from factors including limitations of the data available regarding building footprints to refine vulnerability and risk assessments.

3.2.13 NJ4 Region Risk Assessment Results

A scoring system was developed to rank the overall risk in each municipality by converting the hazard ranking results of low, medium, and high for each of the 12 natural hazards to numeric values of 1, 2 and 3 respectively. Rankings of “N/A” were scored as 0. The scores were then totaled by municipality, which ranged between 10 and 25. The municipalities were then divided in three approximately equal groups corresponding to low, medium, and high aggregate hazard rankings.

This process only indicates general relationships and does not reflect the relative significance of the different hazards, i.e., a high ranking for Geologic Hazards carries the same weight as a high ranking for Flood. Although this method generalizes the risk, it still provides an indication of the overall risk in each municipality based on the assessments completed for all 12 hazards.

Table RP.3-27 and Figure RP.3-1 display the summary risk assessment numeric rankings for the 82 participating municipalities in the NJ4 HMP region. The table shows that Salem City was ranked highest with an overall numeric ranking of 25. A total of six hazards were ranked high in Salem City, with an additional three ranked medium.

Table RP.3-27: NJ4 HMP Summary Risk Assessment – Hazard Ranking Results, Ordered by Numeric Hazard Ranking.

Municipality	County	Cumulative Numeric Hazard Ranking	Overall Municipality Ranking
Salem City	Salem	25	High
Greenwich Township	Cumberland	24	High
Mannington Township	Salem	24	High
Bridgeton City	Cumberland	23	High
Millville City	Cumberland	23	High
Elsinboro Township	Salem	23	High
Pennsville Township	Salem	23	High
Commercial Township	Cumberland	22	High
Lower Alloways Creek Township	Salem	22	High
Quinton Township	Salem	22	High
Camden City	Camden	21	High
Gloucester City	Camden	21	High
Pennsauken Township	Camden	21	High
Fairfield Township	Cumberland	21	High
Maurice River Township	Cumberland	21	High
Oldmans Township	Salem	21	High
Paulsboro Borough	Gloucester	20	High
Carneys Point Township	Salem	20	High
Gibbsboro Borough	Camden	19	High
Downe Township	Cumberland	19	High
Lawrence Township	Cumberland	19	High
Upper Deerfield Township	Cumberland	19	High
Vineland City	Cumberland	19	High
Hopewell Township	Cumberland	18	High

Section 3: Hazard Identification and Risk Assessment

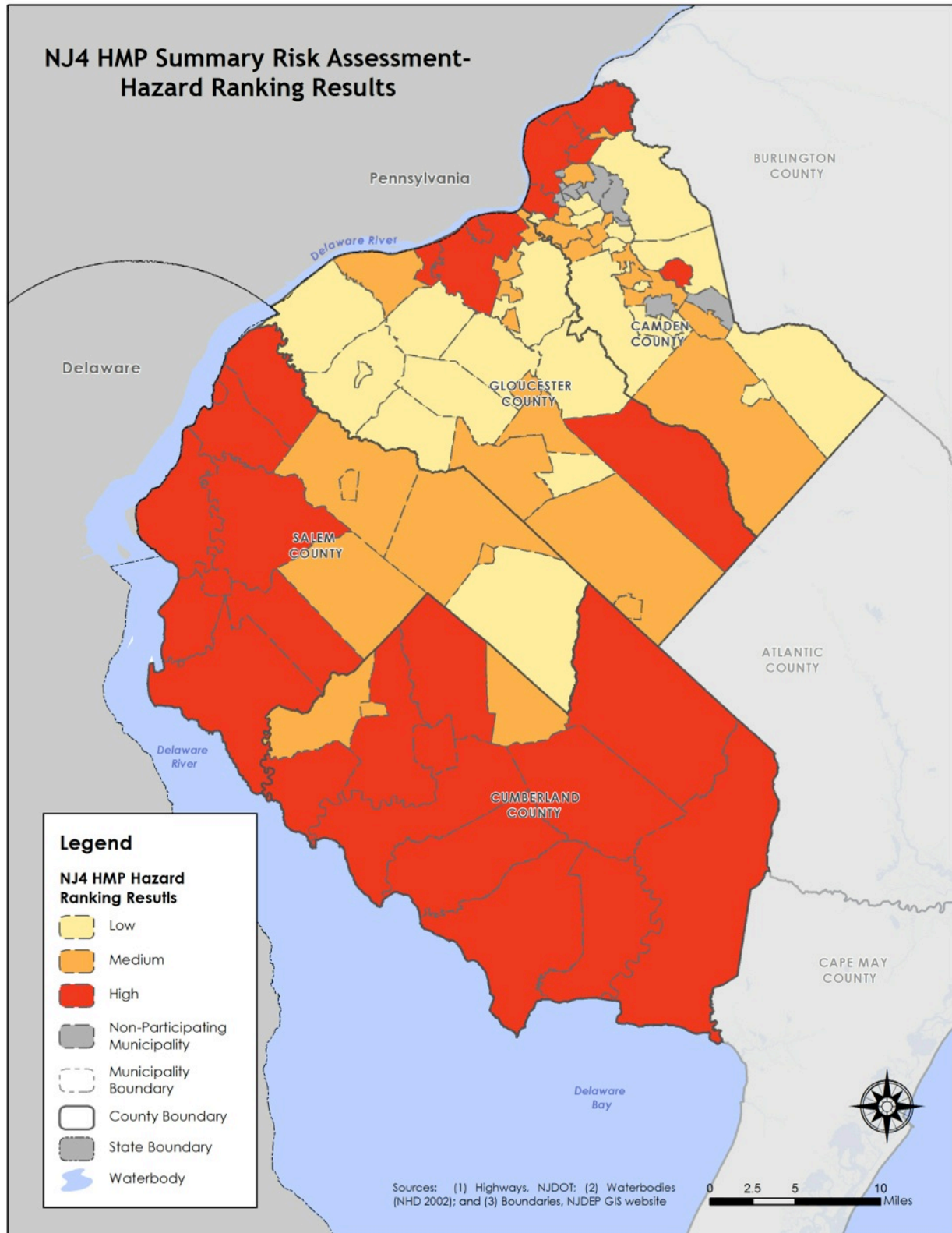
Municipality	County	Cumulative Numeric Hazard Ranking	Overall Municipality Ranking
Monroe Township	Gloucester	18	High
National Park Borough	Gloucester	18	High
West Deptford Township	Gloucester	18	High
Penns Grove Borough	Salem	18	High
Stow Creek Township	Cumberland	17	Medium
Pitman Borough	Gloucester	17	Medium
Wenonah Borough	Gloucester	17	Medium
Westville Borough	Gloucester	17	Medium
Woodbury City	Gloucester	17	Medium
Alloway Township	Salem	17	Medium
Elmer Borough	Salem	17	Medium
Upper Pittsgrove Township	Salem	17	Medium
Barrington Borough	Camden	16	Medium
Stratford Borough	Camden	16	Medium
Deerfield Township	Cumberland	16	Medium
Shiloh Borough	Cumberland	16	Medium
Elk Township	Gloucester	16	Medium
Franklin Township	Gloucester	16	Medium
Greenwich Township	Gloucester	16	Medium
Pilesgrove Township	Salem	16	Medium
Woodstown Borough	Salem	16	Medium
Bellmawr Borough	Camden	15	Medium
Berlin Borough	Camden	15	Medium
Collingswood Borough	Camden	15	Medium
Lindenwold Borough	Camden	15	Medium
Merchantville Borough	Camden	15	Medium
Mount Ephraim Borough	Camden	15	Medium
Runnemede Borough	Camden	15	Medium
Somerdale Borough	Camden	15	Medium
Winslow Township	Camden	15	Medium
Glassboro Borough	Gloucester	15	Medium
Newfield Borough	Gloucester	15	Medium
Woodbury Heights Borough	Gloucester	15	Medium
Brooklawn Borough	Camden	14	Low
Cherry Hill Township	Camden	14	Low
Chesilhurst Borough	Camden	14	Low
Haddon Heights Borough	Camden	14	Low
Laurel Springs Borough	Camden	14	Low
Lawnside Borough	Camden	14	Low
Magnolia Borough	Camden	14	Low

Section 3: Hazard Identification and Risk Assessment

Municipality	County	Cumulative Numeric Hazard Ranking	Overall Municipality Ranking
Pine Hill Borough	Camden	14	Low
Voorhees Township	Camden	14	Low
Deptford Township	Gloucester	14	Low
Logan Township	Gloucester	14	Low
South Harrison Township	Gloucester	14	Low
Pittsgrove Township	Salem	14	Low
Audubon Borough	Camden	13	Low
Gloucester Township	Camden	13	Low
Hi-Nella Borough	Camden	13	Low
Clayton Borough	Gloucester	13	Low
Harrison Township	Gloucester	13	Low
Washington Township	Gloucester	13	Low
Pine Valley Borough	Camden	12	Low
Waterford Township	Camden	12	Low
East Greenwich Township	Gloucester	12	Low
Swedesboro Borough	Gloucester	12	Low
Woolwich Township	Gloucester	12	Low
Mantua Township	Gloucester	10	Low

Section 3: Hazard Identification and Risk Assessment

Figure RP.3-1: NJ4 HMP Summary Risk Assessment – Hazard Ranking Results



3.3 Critical Facility Hazard Exposure Assessment

Critical facilities are prime candidates for mitigation measures due to important functions staged from these facilities prior to, during, and after natural hazards including emergency services and housing vulnerable populations. A substantial effort was undertaken to identify and address hazard-related issues affecting existing critical facilities during the NJ4 HMP planning project.

The process was referred to as the Critical Facility Hazard Exposure Assessment. The intent was to:

- Create a comprehensive and accurate inventory of regional critical facilities
- Identify known issues and areas of concern that can be mitigated as soon as practical
- Initiate a process for evaluation of critical facilities relative to natural hazards to identify other potential problems, issues to be addressed, or considerations for future construction of new or replacement critical facilities

The first step in the critical facility hazard exposure assessment process was to compile as complete a list as possible of critical facilities that are relevant to each participating municipality. FEMA considers a facility critical if damages to that structure (such as flooding or impacts from other hazards) would present an immediate threat to life, public health, and safety.¹ Examples include emergency shelters, hospitals, and utility generating plants. A broader range of facilities considered “critical” was discussed with the Steering Committee and includes (but is not limited to the following):

- Municipal administrative offices
- Emergency Operations Centers (EOCs)
- Data storage centers that contain services or records that may become lost or inoperative
- Fire protection and emergency medical services facilities, including fire and rescue companies, ambulance companies, and other buildings essential to providing emergency services
- Police facilities
- Schools and day care centers for children and the elderly
- Emergency shelters
- Emergency medical care facilities that provide direct patient care, including hospitals, clinics, outpatient services, nursing homes, and housing for the elderly
- Flood-control or storm-protection infrastructure
- Communications facilities that serve in the transmission, switching, and/or distribution of telephone and/or data traffic (publicly owned, managed, or operated only)
- Power-generation facilities that serve in the generation, transmission, and/or distribution of electric power (publicly owned, managed, or operated only)
- Water facilities that serve in the transmission and/or distribution of water by a utility that supplies water for the purposes of drinking, irrigation, fire suppression, or electrical generation (publicly owned, managed, or operated only)
- Sewer and wastewater treatment facilities that serve in the collection, transmission, and/or treatment of sewerage and wastewater (publicly owned, managed, or operated only)

Initial critical facility lists were developed using data accessed from the NJGIN website. This site includes critical and essential facilities data for fire stations, health care, and law enforcement as well as some schools and other community facilities. This data was segregated for each participating municipality and then reviewed as part of the Work Sessions held throughout the summer and fall of 2014.

The knowledge and input of the Working Groups was used to correct inaccurate entries (e.g., addresses, descriptions, etc.) and identify additional facilities considered to be critical or essential (e.g., schools, especially those that serve as emergency shelters).

¹ FEMA Public Assistance Policy Digest, January, 2008, Page 59.

Section 3: Hazard Identification and Risk Assessment

For each critical facility, key characteristics were identified with input from the Municipal Working Groups including:

- Name
- Address
- Use as shelter
- Availability of adequate back-up emergency power
- Known hazard issues (e.g., flooding)

In addition, as part of revising and updating the list of critical facilities, each site was assigned a type and subtype reflecting ownership (e.g., public versus private) and use.

As of [insert date], a total of [insert number] critical facilities were identified in the NJ4 HMP region during the NJ4 HMP planning process. The critical facilities are summarized below in Table RP.3-28 by type and by county.²

Table RP.3-28: Critical Facilities by Type and by County³

Critical Facility Type	Camden County	Gloucester County	Salem County	Cumberland County
Municipal				
EOCs				
Law Enforcement Facilities				
Fire Station/EMS				
Fire Station				
EMS				
Communications				
Emergency Staging Areas				
Health Care Facilities				
Public Works				
Utilities - Electric				
Utilities - Water				
Utilities - Wastewater				
Utilities - Stormwater				
Schools				
Vulnerable Populations Facilities				
Other Municipal				
Totals				

² See *Part 3.4: Critical Facility Inventory and Hazard Exposure Assessment* in the Appendices for lists of critical facilities identified in each participating jurisdiction.

³ **Note to Draft NJ4 HMP Reviewers:** Tables RP.3-28 and RP.3-29, Figure RP.3-2, and related text entries will be completed following the on-going compilation of information from the County and Municipal Appendices.

Section 3: Hazard Identification and Risk Assessment

Some Municipal Working Groups were able to pinpoint existing issues and areas of concern for these critical facilities, which led to the identification of specific mitigation measures.⁴ However, in most cases, the condition of these facilities relative to the potential impacts of hazards in the region was not well understood. Therefore, the NJ4 HMP planning process initiated steps to better understand the exposure of critical facilities and potential implications of these hazards that could be addressed by future mitigation measures.

Specific geographic locations (i.e., longitude and latitude coordinates) were identified for each of the critical facilities in the region. Initially, all critical facilities with street addresses or known locations were assigned coordinates, or “geocoded,” using GIS software. However, these initial geocoding results were typically located in the middle of streets and in some cases, a significant distance from the facility. Therefore, the position of each facility’s coordinates was adjusted using aerial imagery to the middle of the structure or site for each critical facility. After re-positioning, the longitude and latitude coordinates were finalized for each facility.

Note: The manual process to adjust the coordinates for each critical facility was an additional step taken to ensure the accuracy of the data and the utility of the result.

Then, GIS was used to compare the location of critical facilities with the boundaries of spatially defined hazard zones. The analysis was completed for hazards where spatial data was available including:

- Inundation due to sea level rise
- Proximity of high hazard dams
- Flood zones per FEMA Flood Insurance Rate Maps
- Inundation due to storm surge
- Proximity to levees
- Proximity to wildfire fuel or known hazard areas

A summary of the analysis is shown in Table RP.3-29 by hazard zone exposure and by county. In addition, Figure RP.3-2 shows the locations of all critical facilities identified during the NJ4 HMP planning process and indicates if the facility is exposed to one or more of these spatially defined hazards.

The results of the Critical Facility Hazard Exposure Assessment at the municipal level are included in each Appendix. These results indicate which specific critical facilities are potentially exposed to the relevant spatially defined hazards for each jurisdiction. In addition, for the natural hazards identified in the NJ4 HMP that do not have distinct spatial zones, e.g., Earthquake, High Wind, and Severe Weather – Winter, it was initially assumed the risk was essentially equal for the entire region, potentially affecting all critical facilities.

This hazard exposure information is the basis for continuation of the process as part of the implementation of the NJ4 HMP where more information will be gathered about critical facilities to determine whether specific mitigation measures are necessary or appropriate. Each participating jurisdiction has included a mitigation measure in their Appendix that includes conducting site and facility evaluations for the jurisdiction’s critical facilities.⁵

⁴ See *Section 4: Mitigation Measures* in the RHMP for a general description of mitigation measures and *Part 4: Mitigation Measures* in the Appendices for specific mitigation measures included for critical facilities for each participating jurisdiction.

⁵ See Mitigation Measure M-2 in *Part 4: Mitigation Measures* in the Appendices.

Section 3: Hazard Identification and Risk Assessment

The evaluations are structured to quickly identify the ability of individual facilities to withstand hazard impacts. During the site and facility evaluations, differences due to factors such as type of construction materials, age of the structures, or applicable codes when construction occurred will also be taken into account. Any potential weaknesses, issues, or areas of concerns will then be translated into additional mitigation measures as part of on-going plan maintenance and update procedures.⁶

Note: In most cases, any problem areas observed during the site and facility evaluations will require more detailed engineering or architectural review to identify and evaluate options for mitigation.

Table RP.3-29: Critical Facilities Hazard Exposure by County³

Hazard Zone	Camden County	Gloucester County	Salem County	Cumberland County
Increased Inundation +1 Foot				
Increased Inundation +2 Foot				
Increased Inundation +3 Foot				
Dam Failure				
Flood – FIRM Zone V				
Flood – FIRM Zone A				
Flood – FIRM Zone 0.02%				
Storm Surge – Category 1				
Storm Surge – Category 2				
Storm Surge – Category 3				
Storm Surge – Category 4				
Levee Failure				
Wildfire Wildland High Density Urban Interface				
Wildfire Extreme/ High Fuel Level Risk				

⁶ See *Section 4: Mitigation Measures* of the RHMP for information about the critical facility site and facility assessment process and tools as well as the related aspects of the plan maintenance process.

Figure RP.3-2: Critical Facility Locations and Hazard Exposure³

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3.4 Future Development Hazard and Risk Assessment

This subsection of the Regional HMP identifies areas in the region where development may occur in the future based on recent trends in population growth. This was determined by identifying municipalities that have experienced the highest increases in population between years 2000 and 2010. This historical population was used as an indication of areas where development is occurring and may continue in the future. These areas of recent population increase were then compared to municipalities considered to be at higher risk (based on the amount of land area) from three hazards including Coastal Erosion and Sea Level Rise, Flood, and Wildfire.

As part of the SDVR HMPs, the five Planning Areas from the New Jersey Development and Redevelopment Plan (NJDRP) and Smart Growth areas were used with GIS to isolate buildable lands. To identify areas suitable for development in the region:

- Smart Growth areas were identified within Planning Areas 1 and 2 (Metropolitan and Suburban)
- Since both Planning Area categories include developed urban areas, areas categorized as “Urban” by NJDEP Land Use Land Cover data within the Smart Growth areas were eliminated as buildable land
- Areas outside Smart Growth boundaries and also within Planning Areas designated as not suitable for development were also eliminated from the land area identified as suitable for development.

Figures RP.3-3 – RP.3-6 show areas of future growth identified from the SDVR HMPs for the each of the four counties in the region. Highlighted in tan on each map is the remaining buildable land identified in 2010 from within the Smart Growth areas for the region. Also identified on the map are the FEMA designated 1% annual chance flooding (100-year floodplain) and 0.2% annual chance flooding (500-year floodplain) from the effective flood insurance rate map (FIRM).

For the NJ4 HMP, the percent change in population from the 2000 and 2010 census in each municipality was used as an indication of past and future development trends. After determining the change in population, each municipality with an increase in population during this 10 year period was ranked low, medium, or high based on the percent increase. Figure RP.3-7 indicates the ranking results and the percent population change in each municipality between 2000 and 2010. During this time period, the greatest percent increase in population mainly occurred in the eastern part of the region and parts of south-central Gloucester County.

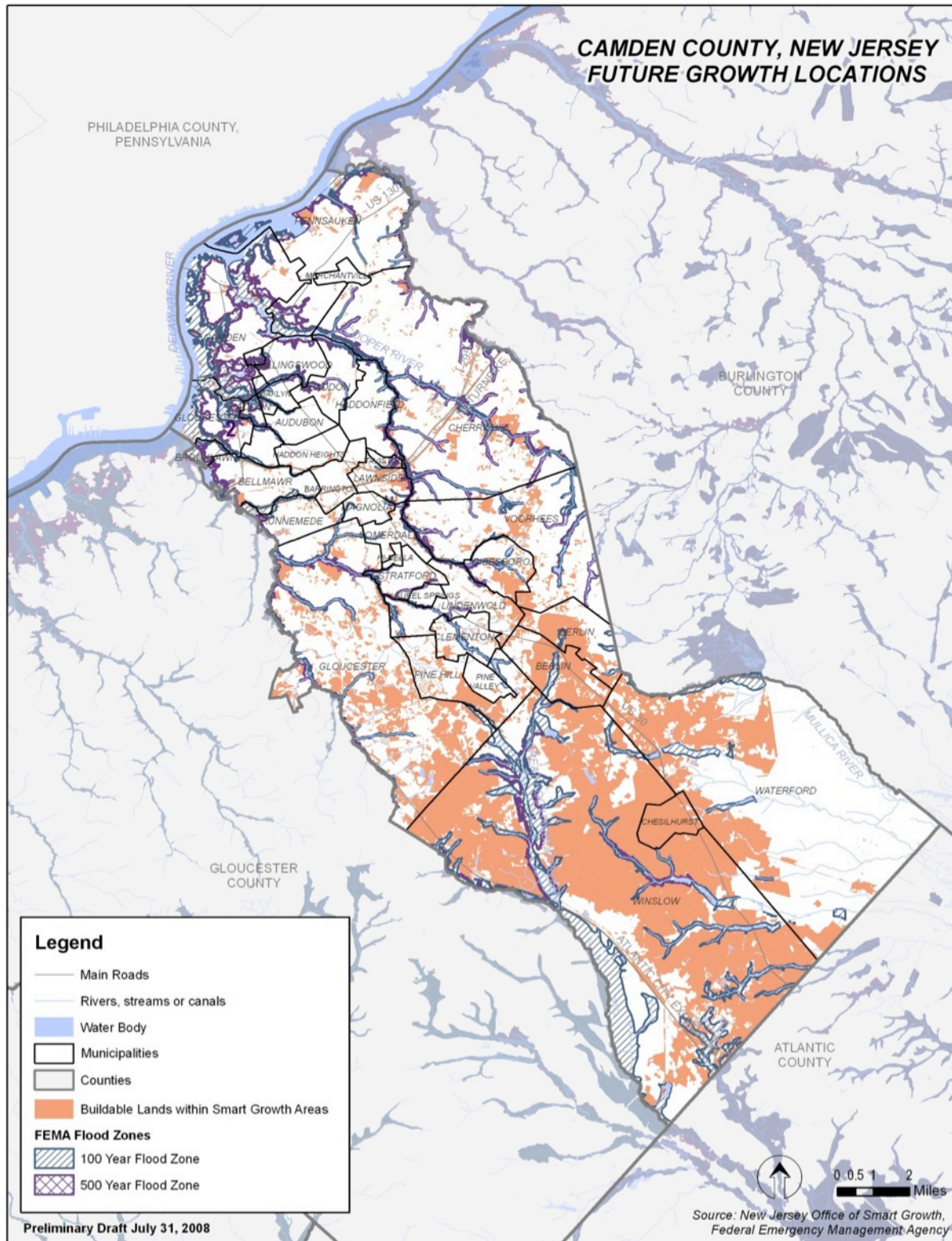
Note: Maurice River Township indicates a greater than 13 percent increase in population over this time period. This high percentage of population increase is due to expansion of a state prison during this time period that added more than 1,000 inmates. Excluding the jail, the percent population change in Maurice River Township would have been ranked low or medium during this time period.

The results of the percent population change analysis can be compared with the buildable lands analysis completed in 2010. Overall, the municipalities ranked high in Figures RP.3-7 correspond with the areas of the region identified as buildable lands. For example, in Camden County there is a large area of buildable lands identified in Winslow Township that is ranked high based on the percent of population change.

There are also inconsistencies between the two analyses. For example, in Salem County the buildable lands in 2010 were mainly concentrated in Oldmans Township and Penns Grove Borough. However, the percent population change analysis showed that Oldmans Township's population decreased during this 10-year period.

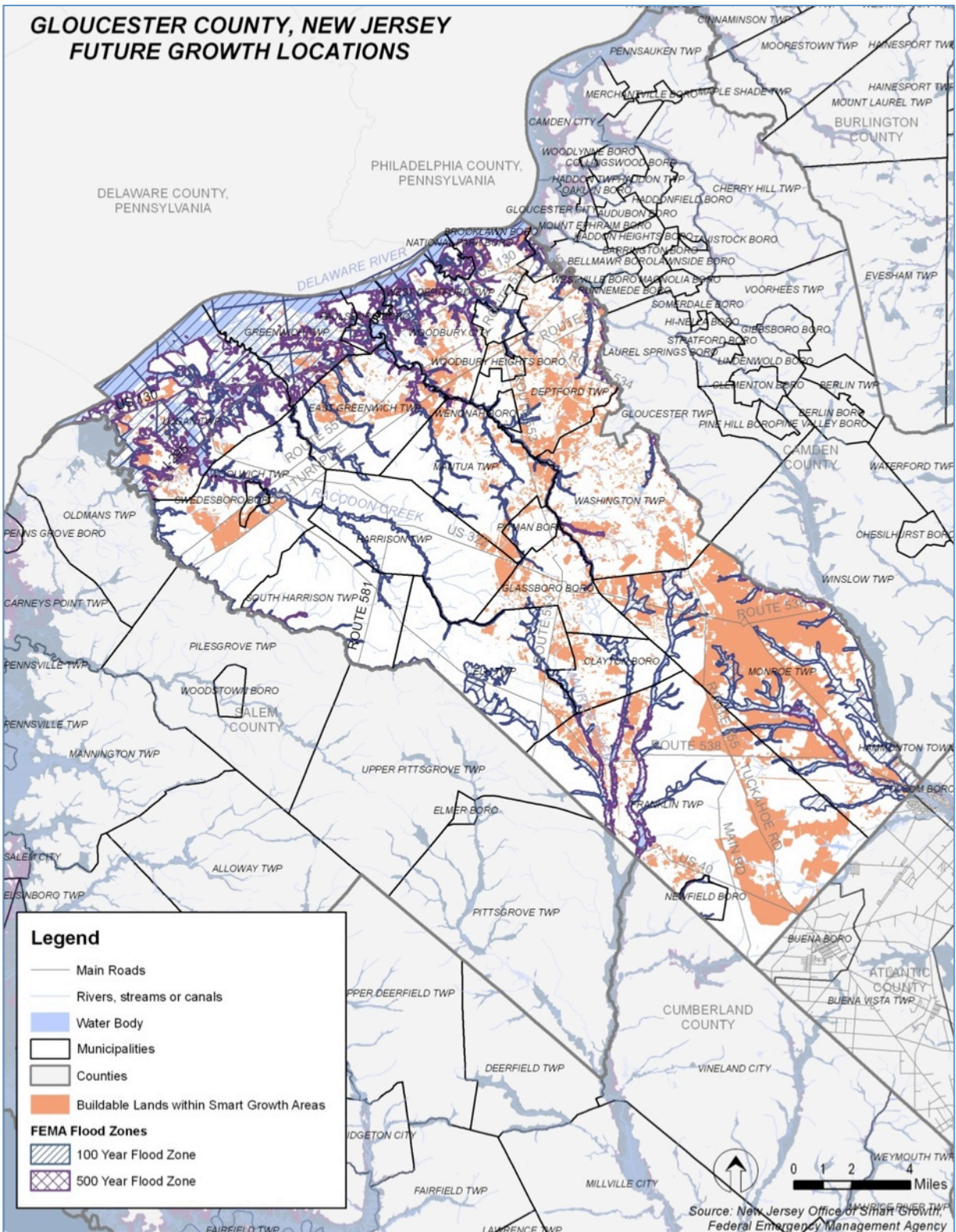
Section 3: Hazard Identification and Risk Assessment

Figure RP.3-3: Future Growth Locations in Camden County
(Sources: 2001 New Jersey State Development and Redevelopment Plan, FEMA, NJDEP)



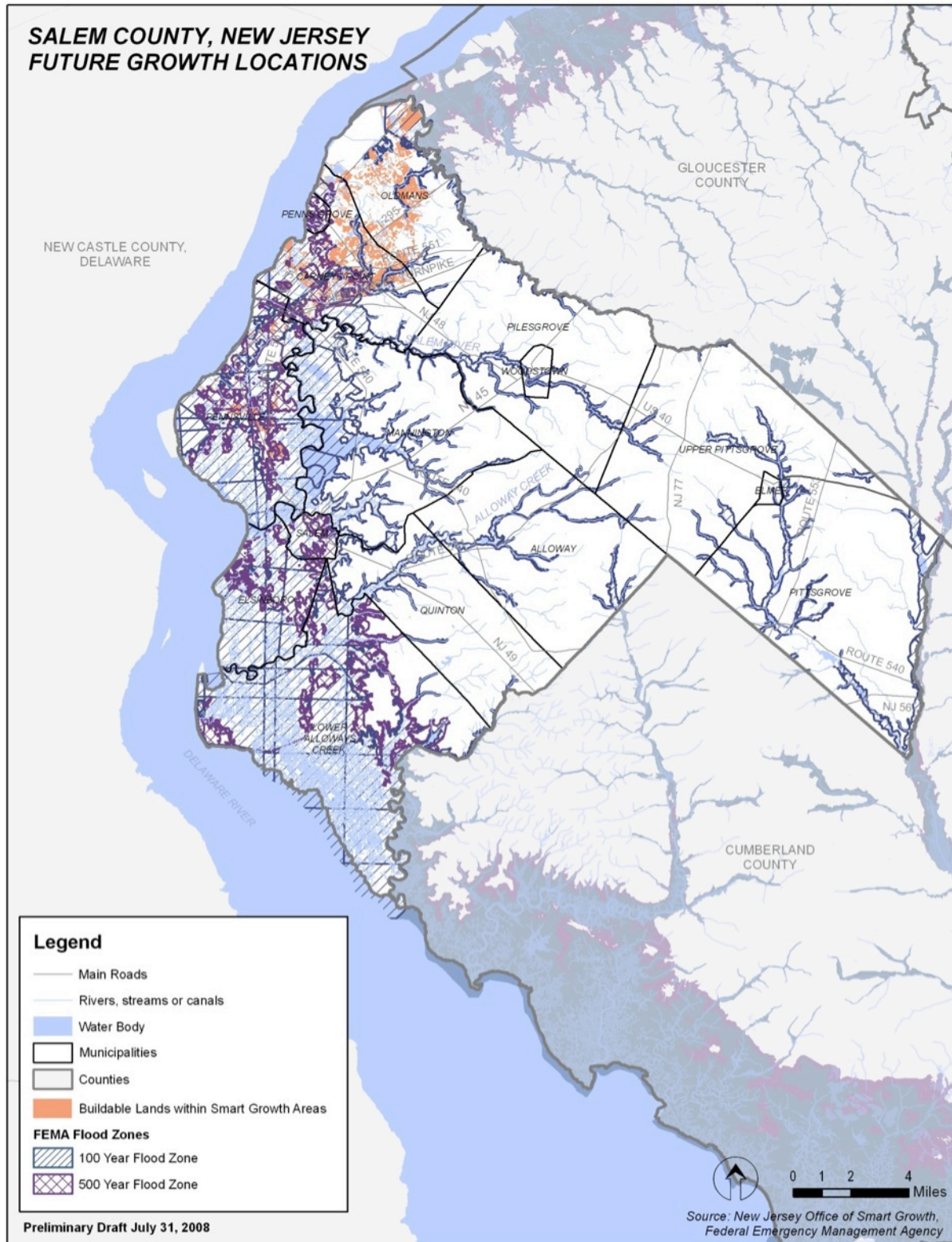
Section 3: Hazard Identification and Risk Assessment

Figure RP.3-4: Future Growth Locations in Gloucester County
(Sources: 2001 New Jersey State Development and Redevelopment Plan, FEMA, NJDEP)



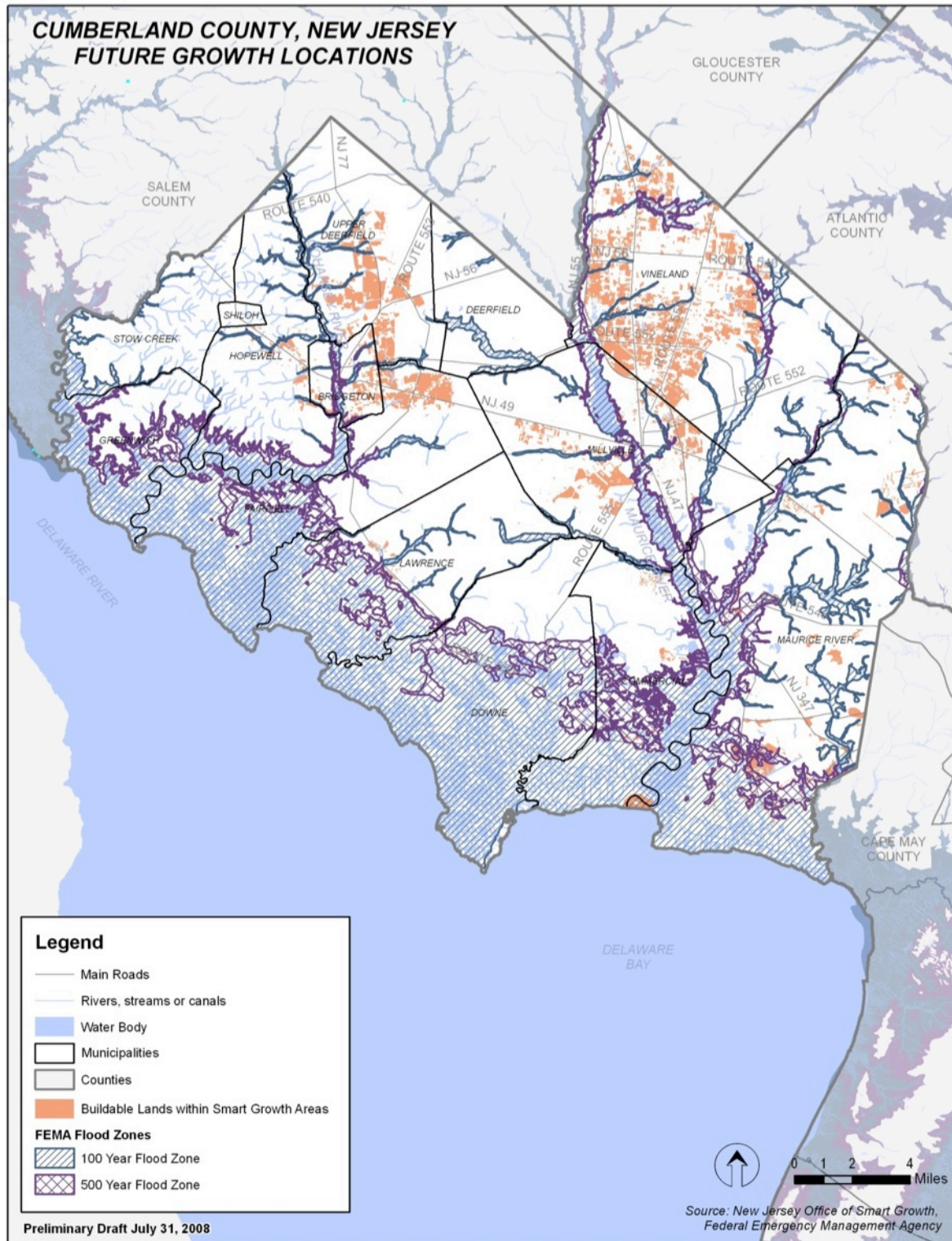
Section 3: Hazard Identification and Risk Assessment

Figure RP.3-5: Future Growth Locations in Salem County
(Sources: 2001 New Jersey State Development and Redevelopment Plan, FEMA, NJDEP)



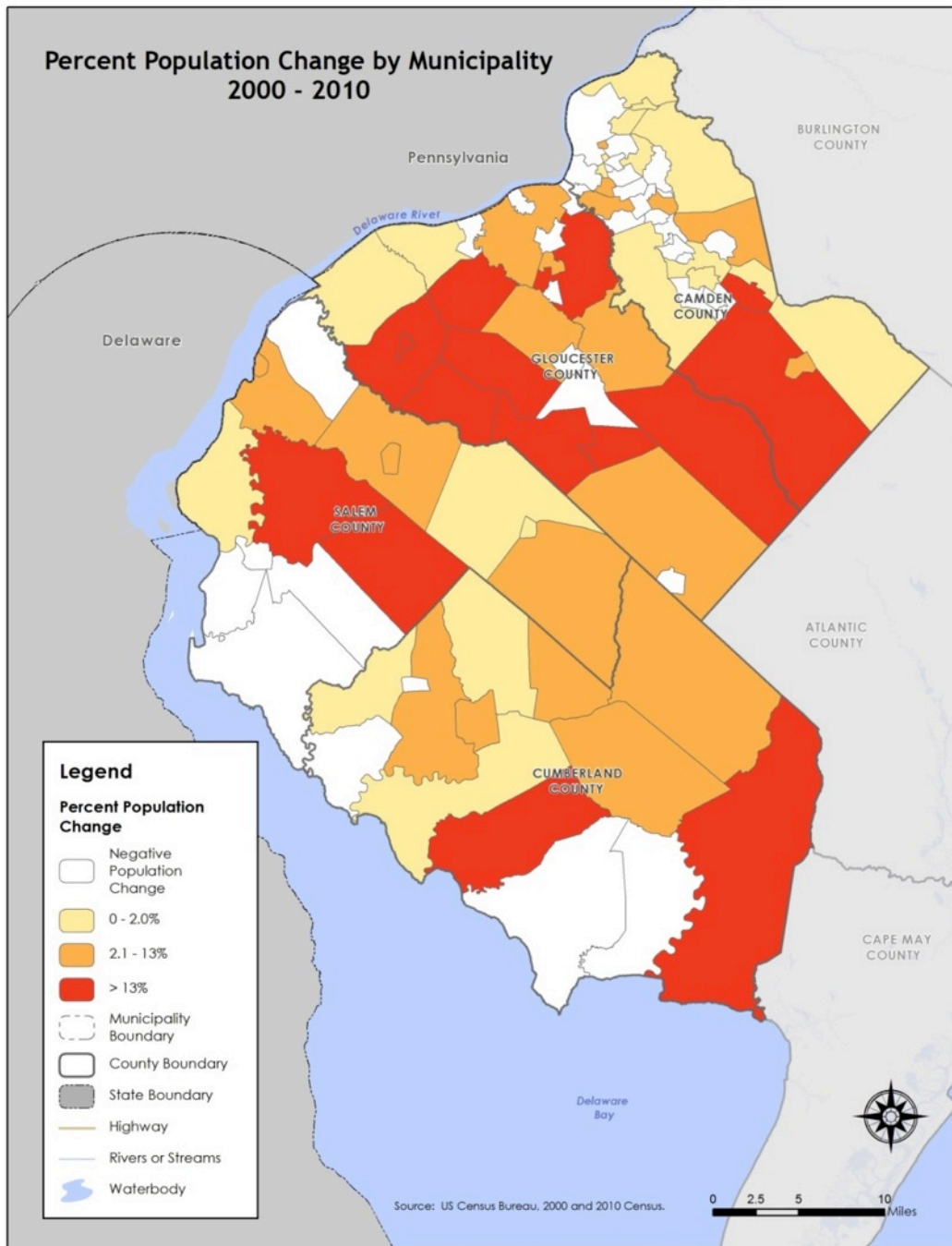
Section 3: Hazard Identification and Risk Assessment

Figure RP.3-6: Future Growth Locations in Cumberland County
(Sources: 2001 New Jersey State Development and Redevelopment Plan, FEMA, NJDEP)



Section 3: Hazard Identification and Risk Assessment

Figure RP.3-7: Percent Population Change by Municipality
(Sources: US Census Bureau, 2000, 2010)



The percent population change analysis identified three areas of interest where municipalities experienced greater than 13 percent increase in population over the 10-year period. Three clusters where municipalities were ranked high in population increase include:

- Eastern Camden and Gloucester counties including Winslow and Monroe Township and Berlin Borough, which is an area of relatively high wildfire risk
- South-central Gloucester County including Elk, Harrison, South Harrison, Mantua, and Woolwich Townships along with Clayton and Swedesboro Boroughs, which includes flood prone areas
- Lawrence Township in Cumberland County, which is subject to coastal erosion and sea level rise

Wildfire

At the eastern boundaries of Camden and Gloucester counties, Winslow and Monroe Township and Berlin Borough were all ranked high in terms of population growth. The main threat to three municipalities in this area of the region is the risk associated with wildfires. This area was further analyzed by comparing the census block populations from years 2000 and 2010 to identify areas where the population has increased or decreased relative to the wildfire risk. Figure RP.3-8 identifies the 2000 population by census block along with the intersection of the high and medium density WUI and extreme fuel hazard risk.

Figure RP.3-9 identifies the 2010 population by census block along with the intersection of the high and medium density WUI and extreme fuel hazard risk. Comparing the two maps, the main difference can be seen in parts of northwestern Winslow Township where the census block population has generally increased from a range of 350-700 in 2000 to over 700 in this same area for 2010. The population increase in western Winslow Township may result in a greater risk from wildfires.

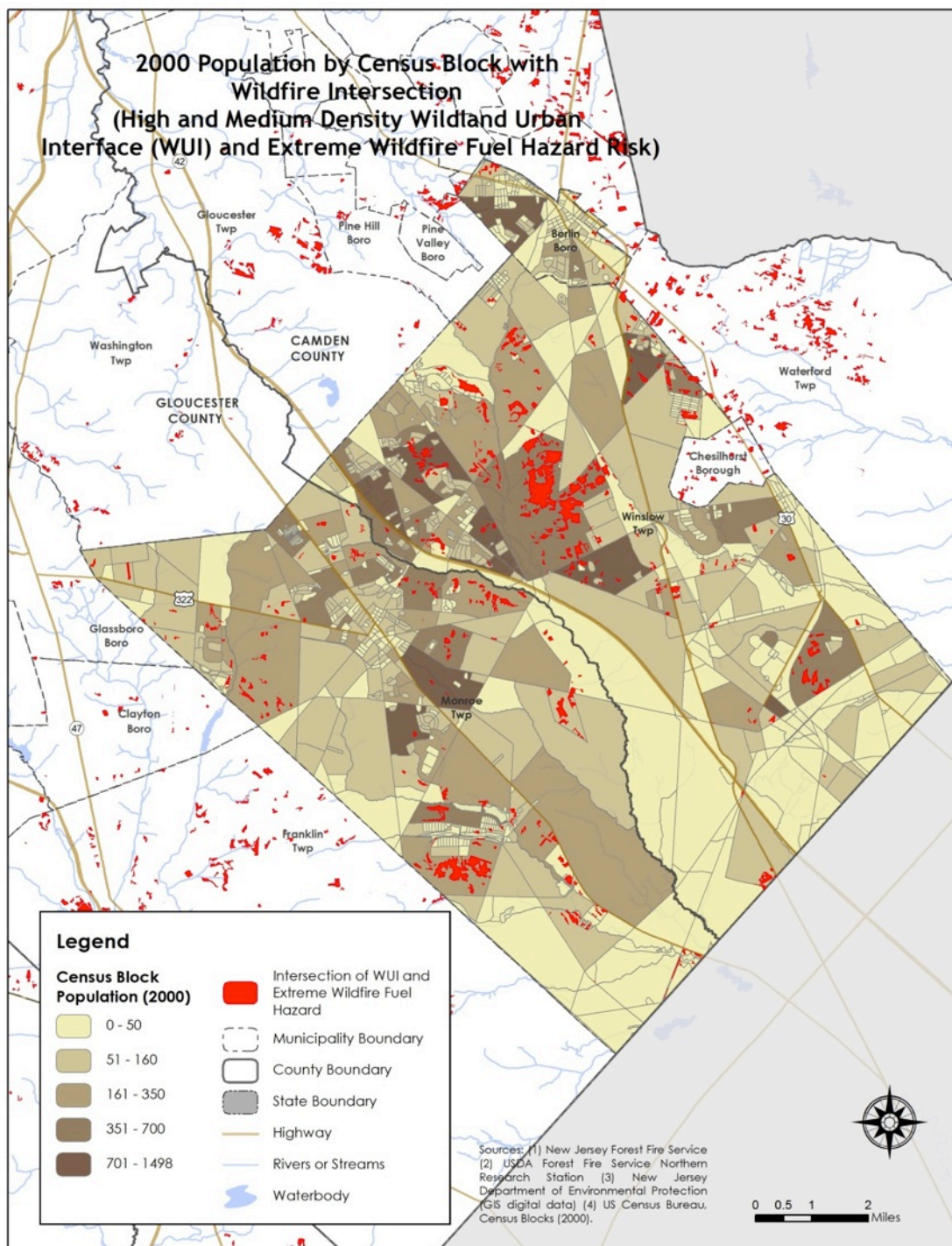
The change in population and wildfire risk comparison for the three municipalities is summarized in Table RP.3-30. Both Monroe and Winslow Townships are ranked at or near the top of the wildfire risk as well as in the top 15 municipalities for population increase.

Table RP.3-30: Population and Wildfire Risk Comparison Summary
(Sources: US Census Bureau, 2010, New Jersey Forest Fire Service, USDA)

Municipality	2000 Population	2010 Population	Population Change	Population Change %	Municipality Rank Based on Population Change (1-90)	High / Med Interface / Intermix and Extreme Fuel Intersection (Land Area SQ miles)	Wildfire Risk Municipality Rank (1-54)
Berlin Borough	6,149	7,588	1,439	23.40%	8th	0.14	13th
Monroe Township	28,967	36,129	7,162	24.70%	7th	0.66	4th
Winslow Township	34,611	39,499	4,888	14.10%	15th	1.86	1st

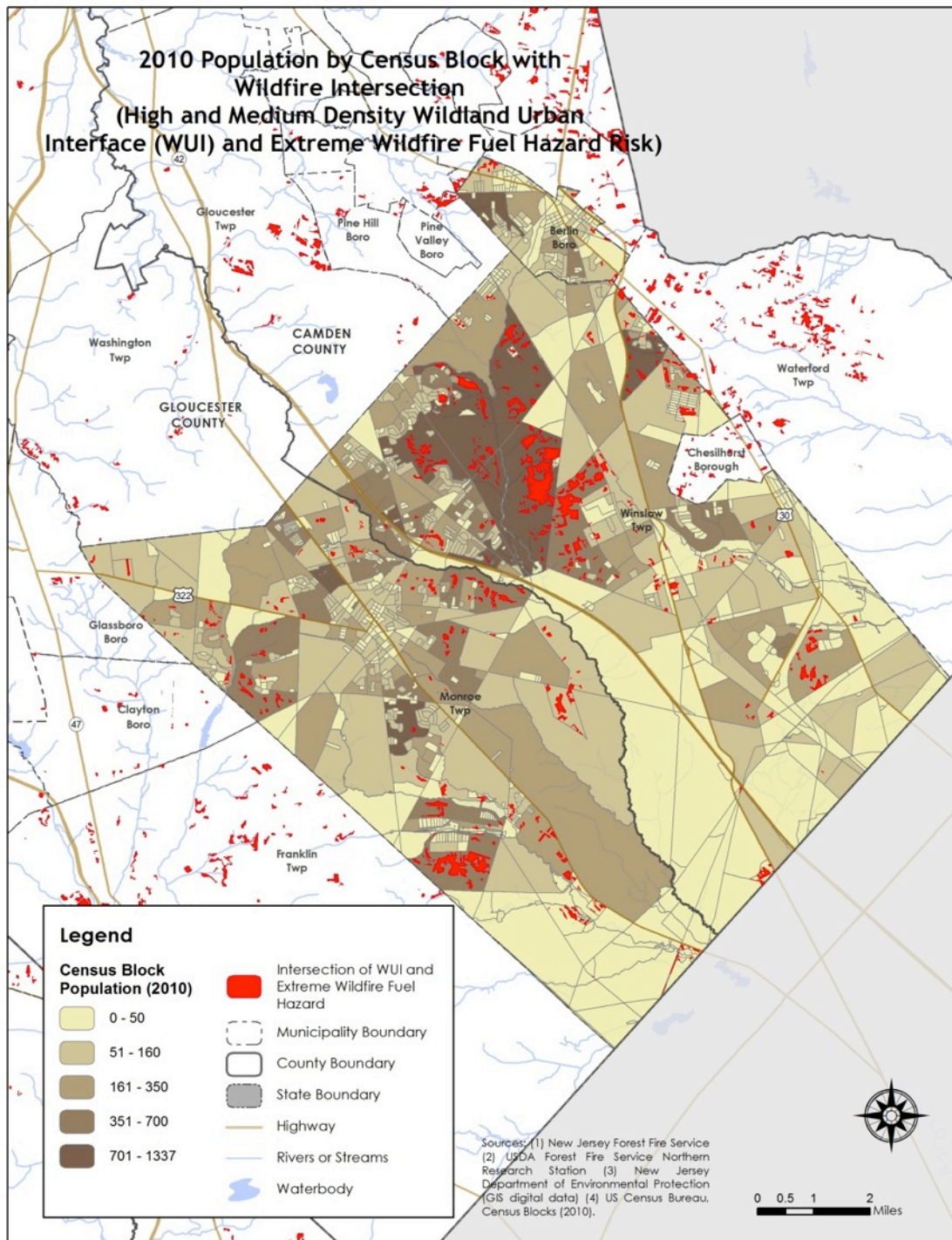
Section 3: Hazard Identification and Risk Assessment

**Figure RP.3-8: 2000 Population by Census Block Including Wildfire Intersection
(High and Medium Density Wildland Urban Interface (WUI) and Extreme Fuel Hazard Risk)**
(Sources: US Census Bureau, 2000, New Jersey Forest Fire Service, USDA)



Section 3: Hazard Identification and Risk Assessment

**Figure RP.3-9: 2010 Population by Census Block Including Wildfire Intersection
(High and Medium Density Wildland Urban Interface (WUI) and Extreme Fuel Hazard Risk)**
(Sources: US Census Bureau, 2010, New Jersey Forest Fire Service, USDA)



Flood

The second area of interest is located in south-central Gloucester County. In this portion of the county, Deptford, Elk, Harrison, South Harrison, Mantua, and Woolwich Townships along with Clayton and Swedesboro Boroughs were all ranked high (greater than 13 percent increase in population). Flooding is one of the main threats to this area of the region. Similar to wildfires, this area was further analyzed by comparing the census block populations from years 2000 and 2010 to identify areas where the population has increased or decreased relative to the flood risk. Figure RP.3-10 identifies the 2000 population by census block along with the intersection of floodplains.

Figure RP.3-11 identifies the 2010 population by census block along with the 1 percent annual chance flooding area and the 0.2 percent annual chance floodplain. Comparing the two maps, the main difference can be seen in central Harrison Township where there is a noticeable increase in population over the 10-year period between years 2000 and 2010. In addition, there are also numerous other census blocks throughout this portion of Gloucester County where the population has increased. The census blocks of greatest concern are those with higher populations and areas of floodplain such as several of the dark brown census blocks in central and western Harrison Township.

The change in population and flood risk comparison for the eight municipalities is summarized in Table RP.3-31. The table shows Woolwich Township had the highest population increase of all 90 municipalities in the NJ4 HMP region between years 2000 and 2010. When compared to the land area in the 1 percent annual chance flooding zone, Woolwich Township also had the highest amount of land in the floodplain compared to the other seven municipalities included in the table. Based on the Gloucester County PFIRM, Woolwich Township had 1.62 square miles of land area in the 1 percent annual chance flooding area. Although Woolwich Township had the most land area in the floodplain compared to the seven other municipalities in the table, it was only ranked 29th overall out of the 82 participating municipalities with land in the floodplain.

Table RP.3-31: Population and Floodplain Risk Comparison Summary

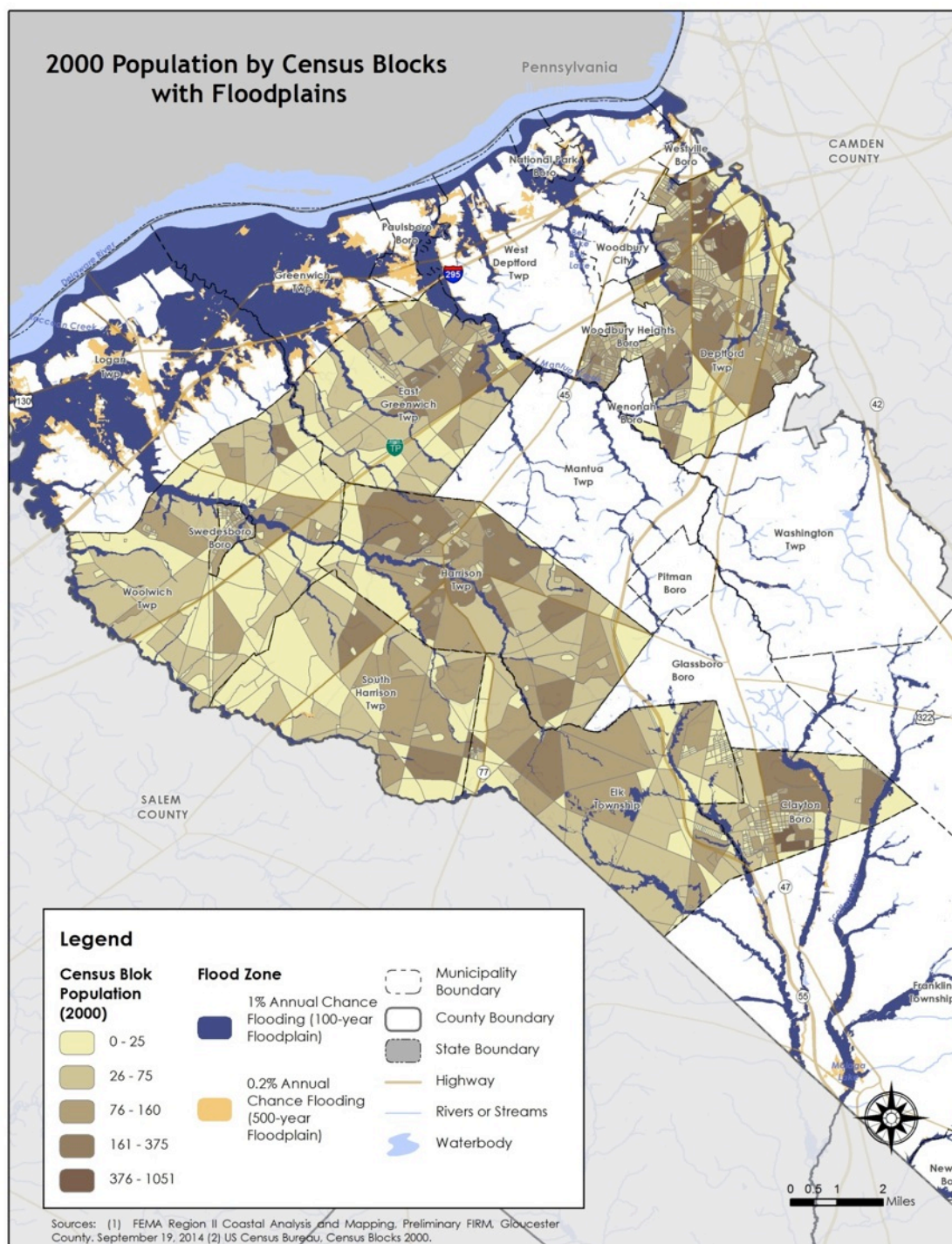
(Sources: FEMA Region II Coastal Analysis and Mapping, PFIRM
Gloucester County, September 19, 2014, US Census Bureau)

Municipality	2000 Population	2010 Population.	Population Change	Population Change %	Municipality Rank Based on Population Change (1-90)	Special Flood Hazard Area (Land Area SQ miles)	Flood Risk - Municipality Rank (1-82)
Clayton Borough	7,139	8,179	1,040	14.50%	13th	0.72	44
Deptford Township	26,763	30,561	3,798	14.10%	14th	1.26	35
East Greenwich	5,430	9,555	4,125	75.90%	2nd	1.40	32
Elk Township	3,514	4,216	702	19.90%	10th	1.39	33
Harrison Township	8,788	12,417	3,629	41.20%	3rd	0.85	43
South Harrison Township	2,417	3,162	745	30.80%	4th	0.53	47
Swedesboro Borough	2,055	2,584	529	25.70%	5th	0.08	71
Woolwich Township	3,032	10,200	7,168	236.41%	1st	1.62	29

Section 3: Hazard Identification and Risk Assessment

Figure RP.3-10: South-Central Gloucester County - 2000 Population by Census Block With Floodplains (PFIRM)

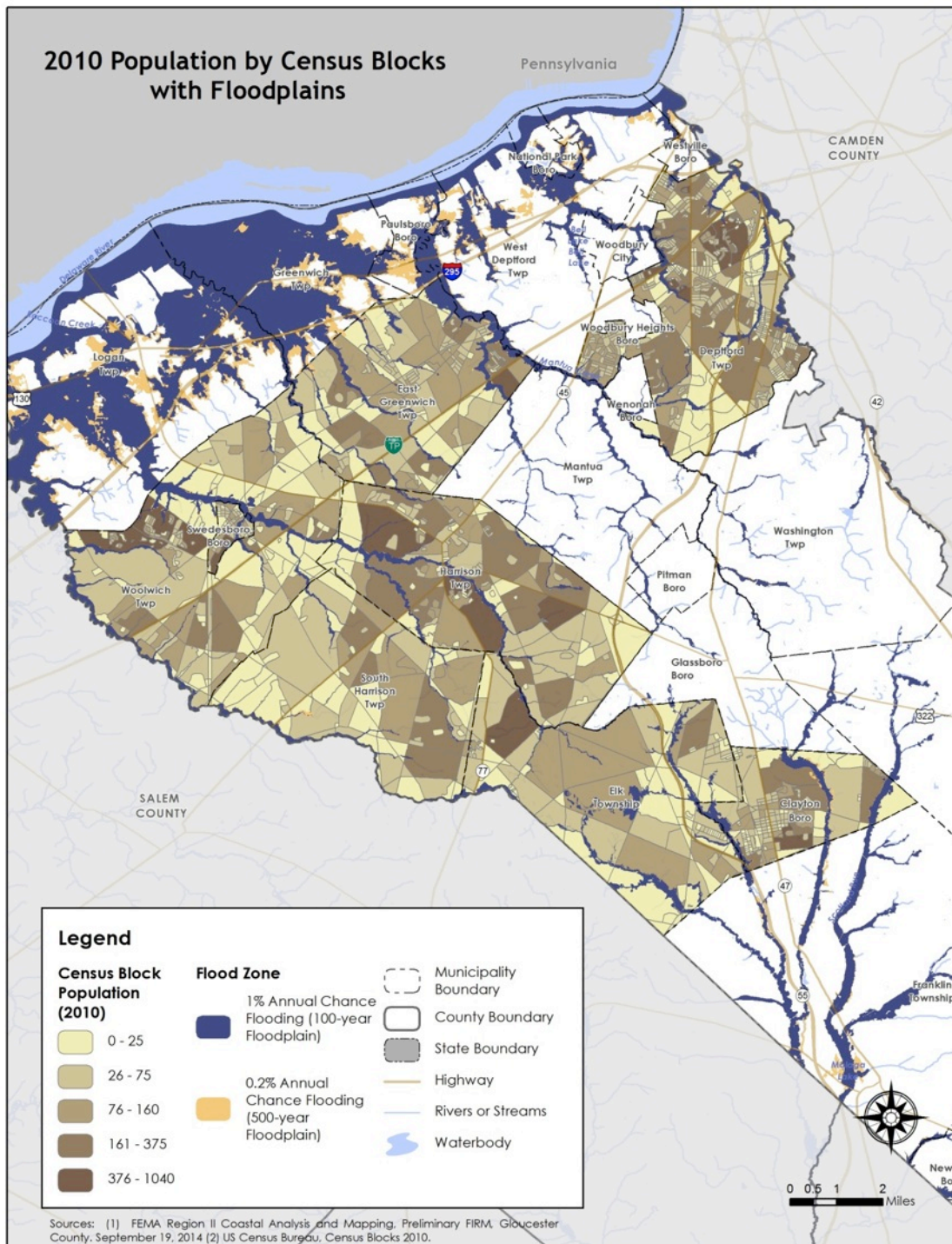
(Sources: FEMA Region II Coastal Analysis and Mapping, Preliminary FIRM Gloucester County, September 19, 2014, US Census Bureau)



Section 3: Hazard Identification and Risk Assessment

Figure RP.3-11: South-Central Gloucester County - 2010 Population by Census Block With Floodplains (PFIRM)

(Sources: FEMA Region II Coastal Analysis and Mapping, Preliminary FIRM
Gloucester County, September 19, 2014, US Census Bureau)



Coastal Erosion and Sea Level Rise

The third area of interest is located in Lawrence Township in Cumberland County which was also ranked high based on the percent population change between years 2000 and 2010. Coastal erosion and sea level rise is one of the main threats to this area of the region along with flooding and storm surge. This area was further analyzed by comparing the census block populations from years 2000 and 2010 to identify areas where the population has increased or decreased relative to the risk from coastal erosion and sea level rise. Figure RP.3-12 identifies the 2000 population by census block, the coastal increased inundation zones of 1, 2 and 3 feet above the BFE, and the area of 1 percent annual chance flooding. The map shows in year 2000, the more densely populated parcels are located in northeastern Lawrence Township.

Figure RP.3-13 identifies the 2010 population by census block along with the coastal increased inundation areas and the 1 percent annual chance flooding area (100-year). Comparing the two maps one of the main differences can be seen along the coastal region of Lawrence Township where in 2010 the census blocks have increased to the higher population per census block categories of 101 - 150 and 151 – 264. This indicates an increase in population within this area of Lawrence Township, an area vulnerable to erosion, sea level rise, and coastal storm surge.

The change in population and sea level rise risk comparison for Lawrence Township is summarized in Table RP.3-32.

Table RP.3-32: Population and Sea Level Rise Risk Comparison Summary

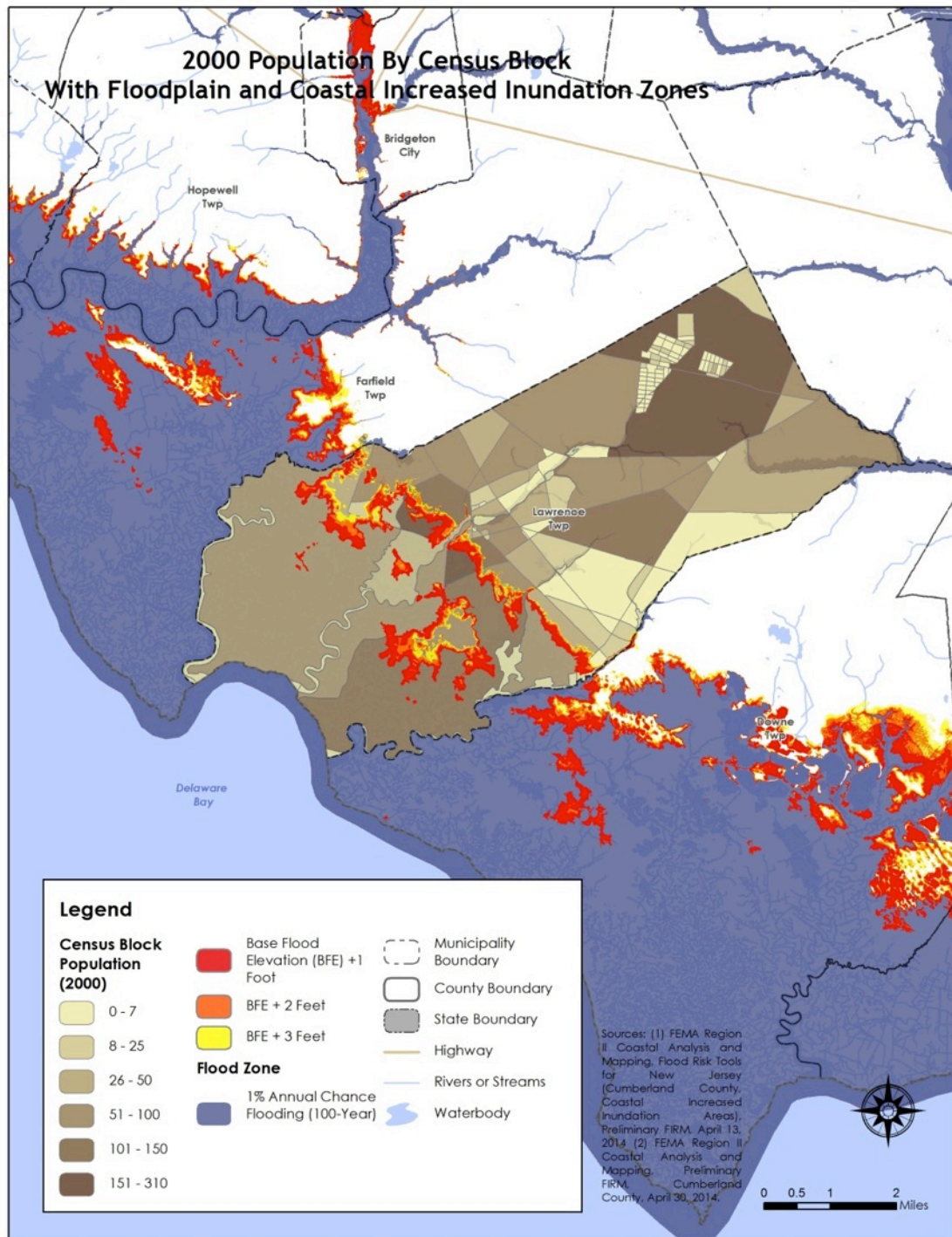
(Sources: FEMA Region II Coastal Analysis and Mapping, Preliminary FIRM
Cumberland County, April 30, 2014 and Coastal Increased Inundation Areas, US Census Bureau)

Municipality	2000 Population	2010 Population	Population Change	Population Change %	Municipality Rank Based on Population Change (1-90)	Sea Level Rise, 3 feet (Land Area SQ miles)	Sea Level Rise Risk - Municipality Rank (1-21)
Lawrence Township	28,967	36,129	7,162	24.72%	7 th	2.54	8 th

Section 3: Hazard Identification and Risk Assessment

Figure RP.3-12: Lawrence Township in Cumberland County - 2000 Population by Census Block With Floodplains (PFIRM) and Coastal Increased Inundation Zones

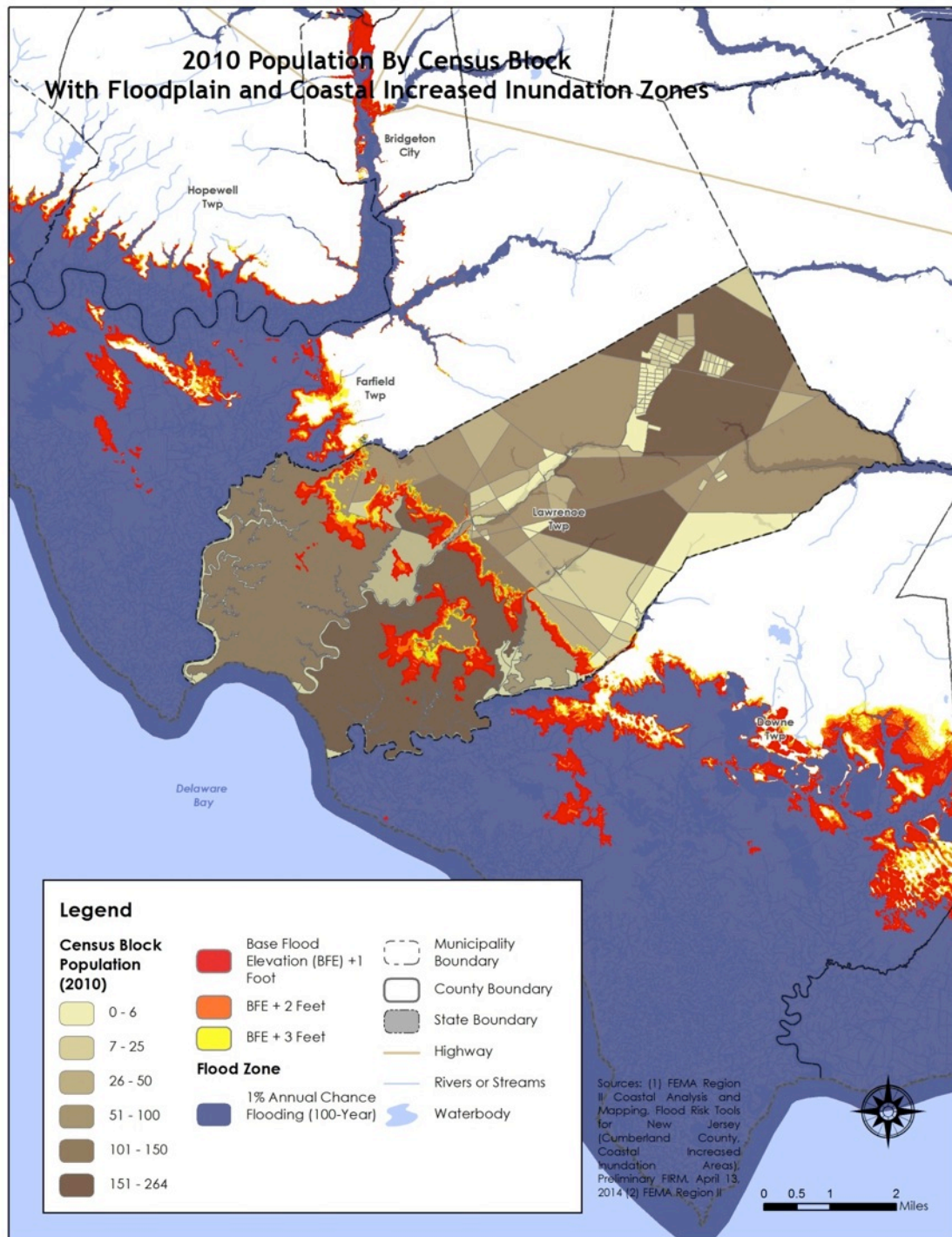
(Sources: FEMA Region II Coastal Analysis and Mapping, Preliminary FIRM
Cumberland County, April 30, 2014 and Coastal Increased Inundation Areas, US Census Bureau, 2000 Census)



Section 3: Hazard Identification and Risk Assessment

Figure RP.3-13: Lawrence Township in Cumberland County - 2000 Population by Census Block With Floodplains (PFIRM) and Coastal Increased Inundation Zones

(Sources: FEMA Region II Coastal Analysis and Mapping, Preliminary FIRM, Cumberland County, April 30, 2014 and Coastal Increased Inundation Areas, US Census Bureau, 2000 Census)



Section 3: Hazard Identification and Risk Assessment

The three areas analyzed were considered to have the highest increase in population between years 2000 and 2010 and occurred in areas potentially at risk from the several of the most significant hazards. Comparing the populations at the census block level identifies specific areas of the region where population is increasing near or within hazard risk areas. A more detailed analysis beyond the census block level would be required to determine if recent and future population increases in these census blocks is actually resulting in development within areas at risk from these hazards.

Implementation of the NJ4 HMP will include follow-up by municipalities, supported by county Offices of Emergency Management, to better assess detailed risk to new development that occurred in potential hazard prone areas. Implementation will also include outreach to property owners and the land development community regarding best practices for risk reduction. The implementation and follow up will incorporate revisions to master plans and land development ordinances to better account for sensitive areas due to hazard conditions (including wildland interface, areas in proximity to flood zones, increased inundation zones, etc.) in future land development proposals and the plan review and approval process.

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Part 4: Mitigation Measures

Part 4.6: Authorities, Policies, Programs, Resources, and Plan Integration

Part 4.6 includes three (3) subparts:

- **Authorities, Policies, and Programs** - Cross referencing relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding existing authorities, policies, and programs in the region and specific information about the jurisdiction's participation and continued compliance in the National Flood Insurance Program (NFIP)
- **Capabilities and Coordination** - Cross referencing relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level and specific information about the jurisdiction's available resources
- **Plan Review and Integration** – Identifying plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan

Authorities, Policies, and Programs

Section 1.3: *Existing Authorities, Policies, Programs, and Resources* of the NJ4 HMP Regional Hazard Mitigation Plan summarizes relevant authorities, policies, and programs related to hazard mitigation in the region including the NFIP. The following identifies jurisdiction-specific information related to this subpart:

- [Identify any variances from the summary statements in Section 1.3 related to the jurisdiction, e.g., specific additional authorities, policies, and/or programs and anticipated ability to expand on and improve these jurisdiction-specific elements during the next five year plan implementation and update cycle]
- Municipal participation in the NFIP includes [insert jurisdiction-specific information re: NFIP participation and commitment to continued compliance including:
 - current NFIP status (i.e., participating versus not participating)
 - history of NFIP participation per FEMA NFIP Community Status Book Report (i.e., dates for initial Flood Hazard Boundary Map, Initial FIRM, and Current Effective Map)
 - designation and involvement of current Floodplain Manager / Administrator during the NJ4 HMP planning process
 - commitment to adopt updated FIRMs and evaluate / update the municipality's Flood Management Plan and/or Ordinance as appropriate per recommendations in Section 4.6 of the NJ4 HMP Regional Hazard Mitigation Plan
 - anticipated ability to expand on and improve these jurisdiction-specific elements during the next five year plan implementation and update cycle]

Capabilities and Coordination

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. Section 1.3: *Existing Authorities, Policies, Programs, and Resources* of the NJ4 HMP Regional Hazard Mitigation Plan includes summary statements regarding regional resources and the impact of resource limitations on the overall approach to the NJ4 HMP mitigation strategies. Section 4: *Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities and coordination at the regional, county, and municipal levels

Part 4: Mitigation Measures

- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation

The following identifies jurisdiction-specific information related to this subpart:

- [identify any jurisdiction-specific issues re: capabilities and coordination, e.g., consistency with regional resource summary, full versus part-time versus volunteer OEM coordinator, and anticipated ability to expand on and improve these jurisdiction-specific elements during the next five year plan implementation and update cycle]

Plan Review and Integration

Specific documents obtained during the plan update process from the Municipal Working Group include:

- [list of jurisdiction specific documents provided by the Municipal Working Group (already incorporated in individual Appendices)]

Table RP.4-4 in *Section 4.6: Plan Review and Integration* of the NJ4 HMP Regional Hazard Mitigation Plan identifies the primary plans and documents collected from each of the participating municipalities. In addition, Annex E.2 provides a complete list of all the plans and documents collected from the participating municipalities.

Section 4.6 also includes the results of reviewing the primary plans and documents to determine the extent to which these documents reflect up-to-date hazard risk and mitigation. In addition, Section 4.6 includes recommendations for integrating the results of the NJ4 HMP, including hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level that are relevant to all participating municipalities and incorporated by reference in each of the jurisdiction-specific Appendices including:

- Hazard Assessments
- Emergency Operations Plans
- Floodplain Management Ordinances
- Master Plans and Reexamination Reports
- Other plans and documents

[municipality] is committed to reviewing and following these recommendations during future scheduled updates of these various documents as considered appropriate by the Working Group and the governing body of the municipality.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Draft

April 17, 2015

Index

Appendix GC.1: Gloucester County
Appendix GC.2: Clayton Borough
Appendix GC.3: Deptford Township
Appendix GC.4: East Greenwich Township
Appendix GC.5: Elk Township
Appendix GC.6: Franklin Township
Appendix GC.7: Glassboro Borough
Appendix GC.8: Greenwich Township
Appendix GC.9: Harrison Township
Appendix GC.10: Logan Township
Appendix GC.11: Mantua Township
Appendix GC.12: Monroe Township
Appendix GC.13: National Park Borough
Appendix GC.14: Newfield Borough
Appendix GC.15: Paulsboro Borough
Appendix GC.16: Pitman Borough
Appendix GC.17: South Harrison Township
Appendix GC.18: Swedesboro Borough
Appendix GC.19: Washington Township
Appendix GC.20: Wenonah Borough
Appendix GC.21: West Deptford Township
Appendix GC.22: Westville Borough
Appendix GC.23: Woodbury City
Appendix GC.24: Woodbury Heights Borough
Appendix GC.25: Woolwich Township
Appendix GC.26: Rowan University

Legend

- As of April 17, 2015, the municipality has been a full participant in the NJ4 HMP planning process but completion of the municipality's Appendix is pending information to be provided by the municipality.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.1
Gloucester County, New Jersey

April 8, 2016

Table of Contents

Table of Contents	GC.1-i
Part 1 Overview	GC.1-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.1-1
1.2: Gloucester County Appendix	GC.1-1
Part 2 Participation	GC.1-2
2.1: County Working Group Participation	GC.1-2
2.2: Public Participation	GC.1-5
Part 3 Hazard Identification and Risk Assessment	GC.1-7
3.1: County Profile	GC.1-7
3.2: Hazard Priorities	GC.1-12
3.3: Hazard Mapping	GC.1-13
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.1-14
Part 4 Mitigation Measures	GC.1-24
4.1: Mitigation Goals and Strategy	GC.1-24
4.2: SDVR HMP Mitigation Measures	GC.1-25
4.3: County Mitigation Measures – Identification	GC.1-28
4.4: County Mitigation Measures – Implementation	GC.1-31
4.5: Multi-Jurisdictional Mitigation Measures	GC.1-33
4.6: Authorities, Policies, Programs, Resources, and Plan Integration	GC.1-40

Table of Contents

List of Figures

Figure GC.1-1: Gloucester County Location Map	GC.1-7
Figure GC.1-2: Gloucester County Base Map	GC.1-8
Figure GC.1-3: Gloucester County Housing Units by Year Built	GC.1-11

List of Tables

Table GC.1-1: Gloucester County Working Group	GC.1-2
Table GC.1-2: Public Participation	GC.1-6
Table GC.1-3: Gloucester County Demographics	GC.1-10
Table GC.1-4: Gloucester County Demographic Rankings	GC.1-10
Table GC.1-5: Gloucester County Economics and Housing	GC.1-10
Table GC.1-6: Gloucester County Ranking (Economics and Housing)	GC.1-11
Table GC.1-7: Supporting Mapping and Exhibits	GC.1-13
Table GC.1-8: Gloucester County Critical Facilities Inventory	GC.1-15
Table GC.1-9: Gloucester County Critical Facilities Hazard Exposure	GC.1-23
Table GC.1-10: Gloucester County Mitigation Program Accomplishments	GC.1-25
Table GC.1-11: Gloucester County Mitigation Measures Identification	GC.1-28
Table GC.1-12: Gloucester County Mitigation Measures Implementation	GC.1-31
Table GC.1-13: Gloucester County Multi-Jurisdictional Mitigation Measures	GC.1-33

Attachments

Attachment GC.1.A: Public Review Comments	GC.1.A-1
Attachment GC.1.B: Adoption Resolution	GC.1.B-1
Attachment GC.1.C: Approval Letter	GC.1.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating counties and municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating counties and municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures.

Part 1.2: Gloucester County Appendix

This Appendix is focused on Gloucester County, New Jersey.

The Gloucester County Working Group recommended the Gloucester County Appendix for adoption to the Gloucester County Board of Freeholders.

The Gloucester County Board of Freeholders adopted the Gloucester County Appendix by resolution (see Attachment B: Adoption Resolution).

Region II of the Federal Emergency Management Agency subsequently approved the Gloucester County Appendix (see Attachment C: Approval Letter).

Part 2: Participation

Part 2.1: County Working Group Participation

Part 2.1 includes:

- County Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the County Appendix
- County positions and organizations that were invited but were not able to participate in the plan update process
- County positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on County Working Groups but do not exist in the county

Table GC.1-1 identifies the County Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the County Working Groups are comprised of representatives who worked to make sure mitigation measures included in the County Appendix addressed the risks faced by county assets that may affect delivery of services to residents, businesses, and property owners and reflected the priorities of the community. The Working Group was engaged via a variety of Work Sessions and meetings including:

- Round 1 and Round 2 Work Sessions
- Quarterly Emergency Management Council / Local Emergency Planning Committee Meetings
- Individual meetings with County agencies and departments

The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.1-1: Gloucester County Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Other ²	Round 2 Work Session ³	Contribution ⁴
J. Thomas	Butts	Gloucester County Office of Emergency Response	Emergency Management Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (9.25.14)		Organized Working Group and Work Sessions.
Jack	DeAngelo	Gloucester County Office of Emergency Response	Deputy Emergency Management Coordinator	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Provided liaison with Gloucester County municipal OEM coordinators.
Len	Clark	Gloucester County Office of Emergency Response	Deputy Emergency Management Coordinator	<input checked="" type="checkbox"/>			
Larry	Haynes, Sr.	Gloucester County Department of Public Works	Director	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (9.25.14)		
Joseph	D'Alessandro	Gloucester County Highway Department	Deputy Director Public Works		<input checked="" type="checkbox"/> (EMC/LEPC)		

¹ Round 1 Work Session was held on July 10, 2014.

² Entries in the "Other" column include participation in periodic Emergency Management Council / Local Emergency Planning Committee meetings and/or individual county agency interviews conducted on September 25, 2014.

³ Round 2 Work Session was held on November 13, 2014.

⁴ County Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.1-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Other ²	Round 2 Work Session ³	Contribution ⁴
Wayne	Love	Gloucester County Utilities Authority	Engineering Technician		<input checked="" type="checkbox"/> (9.25.14)		
Vincent	Voltaggio	Gloucester County Office of the County Engineer	County Engineer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (9.25.14)		Contributed detailed information regarding completed and on-going mitigation projects.
David	Lubelski	Gloucester County Office of the County Engineer	Assistant County Engineer		<input checked="" type="checkbox"/> (EMC/LEPC)		
Richard	Westergaard	Gloucester County Department of Public Works - Planning Division	Director	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (9.25.14)		Contributed detailed information regarding on-going update of Gloucester County Master Plan and contact information for related agencies and organizations.
Christina	Velazquez	Gloucester County Department of Public Works - Planning Division	Senior Program Analyst	<input checked="" type="checkbox"/>			
Theresa	Ziegler	Gloucester County Department of Public Works - Planning Division	GIS Specialist III	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (9.25.14)		Contributed GIS capabilities information and on-going involvement in the development of tools for critical facilities and HIRA components of plan implementation.
Andre	Bay	Gloucester County Sheriff's Office	Undersheriff	<input checked="" type="checkbox"/>			
Dan	Abate	Gloucester County Sheriff's Office	Investigator		<input checked="" type="checkbox"/> (EMC/LEPC)		
Edward	Johnson	Gloucester County Office of Emergency Response - Fire Marshall's Office	County Fire Marshall	<input checked="" type="checkbox"/>			
Charles	Murtaugh	Gloucester County Office of Emergency Response - Fire Marshall's Office	Deputy County Fire Marshall			<input checked="" type="checkbox"/>	Contributed detailed information regarding Gloucester County critical facilities.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Other ²	Round 2 Work Session ³	Contribution ⁴
Dennis	Kappler	Gloucester County Office of Emergency Response	Fire Coordinator			<input checked="" type="checkbox"/>	
Andy	Lovell	Gloucester County EMS	EMS Chief	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (EMC/LEPC)		
Lisa	Cerny	Gloucester County Department of Human Services	Director		<input checked="" type="checkbox"/> (EMC/LEPC)		
Carla	Kephart	Gloucester County Health Department	Health Educator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (EMC/LEPC)		
Saul	Hernandez	Gloucester County Justice Complex	Assistant Trial Court Administrator		<input checked="" type="checkbox"/> (EMC/LEPC)		
Tom	Bianco	Gloucester County Economic Development	Acting Director of Economic Development	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (9.25.14)		
Michelle	Giuliani-Shirey	Gloucester County Department of Economic Development	Division Head Business Development		<input checked="" type="checkbox"/> (9.25.14)		
Ken	Atkinson	Gloucester County Office of Land Preservation	Director		<input checked="" type="checkbox"/> (9.25.14)		
Victor	DeVasto	Gloucester County Soil Conservation District	Director	<input checked="" type="checkbox"/>			
Peter	Amico	Rowan University Department of Public Safety	Director of Emergency Management	<input checked="" type="checkbox"/>			
Mike	Kantner	Rowan University Department of Public Safety	AUP-OEM Coordinator		<input checked="" type="checkbox"/> (EMC/LEPC)		
Jim	Baca	Inspira Medical Center Woodbury	Director, EMS, Preparedness & Security	<input checked="" type="checkbox"/>			
Stephen	Cope	Kennedy Health System	Deputy Emergency Management Coordinator	<input checked="" type="checkbox"/>			
Taft	Barrett	American Red Cross	Disaster Program Specialist		<input checked="" type="checkbox"/> (EMC/LEPC)		
Stephen	Brown ⁵	American Red Cross	Disaster Volunteer Fleet Manager		<input checked="" type="checkbox"/> (EMC/LEPC)		

⁵ As of January 30, 2015, Mr. Brown is no longer with the American Red Cross.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Other ²	Round 2 Work Session ³	Contribution ⁴
Stephen	Freiman	American Red Cross	Mass Care Coordinator		<input checked="" type="checkbox"/> (EMC/LEPC)		
James	Shew	American Red Cross	Emergency Response Manager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (EMC/LEPC)		
Bert	Lopez	Atlantic City Electric	Liaison for Gloucester County EMC		<input checked="" type="checkbox"/> (EMC/LEPC)		
Patrick	Robinson	Paulsboro Refining Company	Fire Chief	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (EMC/LEPC)		

The Board of Freeholders of Gloucester County have been aware of the project from the initial stages since the grant funding the planning process was awarded to Gloucester County on behalf of all four participating counties. In addition, the Board of Chosen Freeholders and the County Administrator were briefed regarding the Gloucester County Appendix during a regular Board of Freeholders meeting on February 4, 2015.

All candidate positions and organizations within the community that were extended invitations were able to participate during the development of the County Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁶

The following lists positions and organizations that are generally recommended for consideration as members of the County Working Groups by FEMA but do not currently exist within at the county level. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- Floodplain Administrator/Manager – There is no unincorporated land in Gloucester County so there are no parcels that could potentially be covered under the National Flood Insurance Program.

⁶ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the county to participate during the plan update process.

Since all county residents reside in an incorporated municipality, it is assumed that the main connections with the public are made through the municipalities and their respective Working Groups. However, Table GC.1-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties by Gloucester County to participate in the development of the plan update.

Table GC.1-2: Public Participation

Date	Type of Involvement	Location
July 2015	Link to Project Website (http://nj4hmp.com) established	Gloucester County website, Pre-Disaster Mitigation webpage (under the Office of Emergency Response webpage) ⁷
December 18, 2014	Preliminary County Appendix posted to website for public comment	Gloucester County website, Office of Emergency Response webpage ⁸
February 4, 2015	Public hearing included on Gloucester County Board of Freeholders agenda providing for open discussion, and public comment regarding the Preliminary County Appendix	Gloucester County Courthouse 1 North Broad Street, Woodbury, New Jersey

Public comments and input received for the Preliminary County Appendix were considered by the County Working Group and incorporated into the Draft County Appendix where appropriate. Public comments received during the review of the Preliminary County Appendix were included in Attachment A to the County Appendix along with a brief explanation of how the comments were addressed in the Draft County Appendix.

In addition, the County Appendix was adopted as part of a regularly scheduled public meeting (See Attachment B: Adoption Resolution).

Public education and outreach is an on-going mitigation measure included in the County Appendix.⁹ In addition, public participation will continue to be encouraged by the Gloucester County Working Group during subsequent plan implementation and maintenance activities at the municipal and institutional level.¹⁰

⁷ <http://www.gloucestercountynj.gov/depts/e/emeresponse/ememanage/predisaster.asp>

⁸ <http://www.gloucestercountynj.gov/depts/e/emeresponse/default.asp>

⁹ See Mitigation Measure M-1 in *Part 4: Mitigation Measures* of the County Appendix.

¹⁰ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

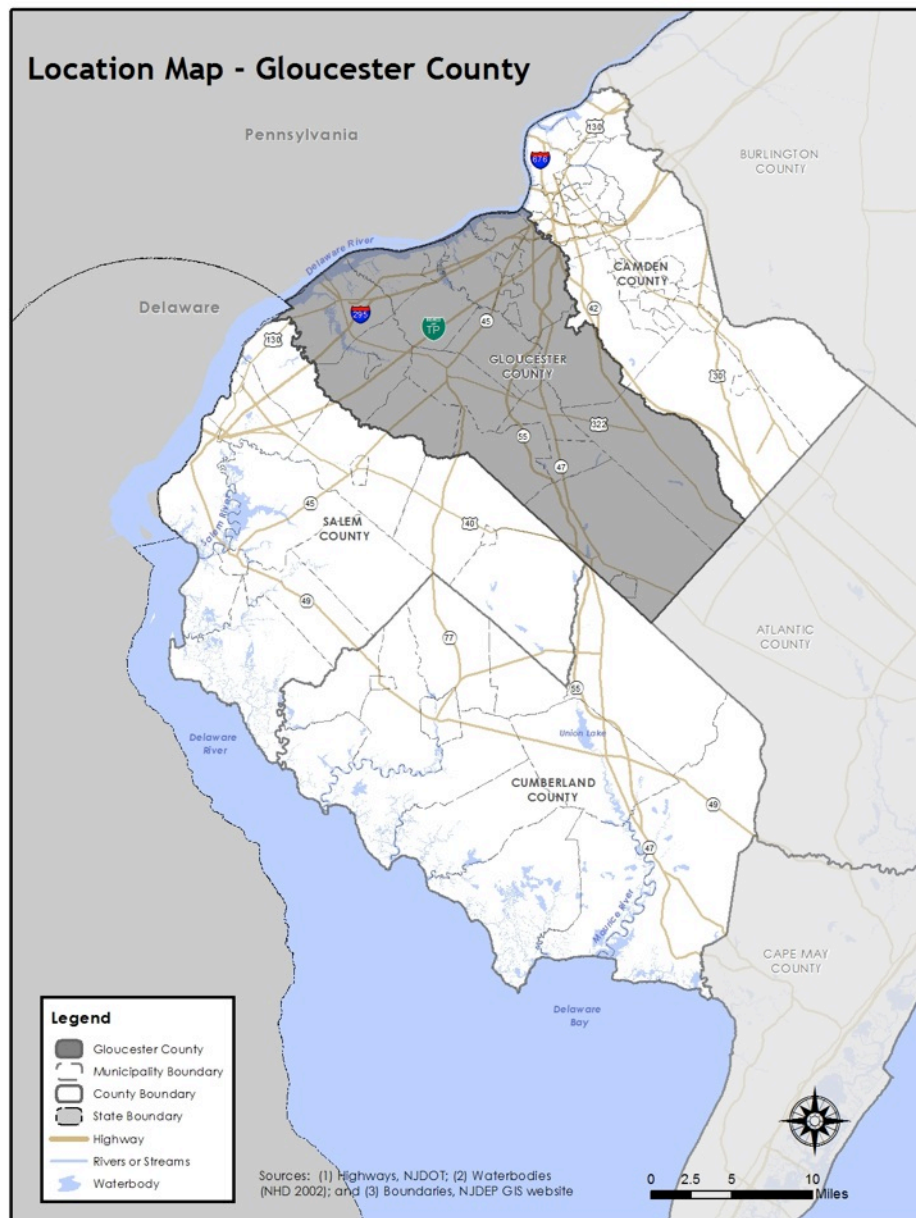
Part 3.1: County Profile

Part 3.1 includes:

- *Selected data and information about the county that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the county that is only intended to portray a few of the most basic elements*

Gloucester County is located in southwest New Jersey along the Delaware River and bordered by Camden County to the north, Salem and Cumberland Counties to the south, and Atlantic County to the east (See Figure GC.1-1).

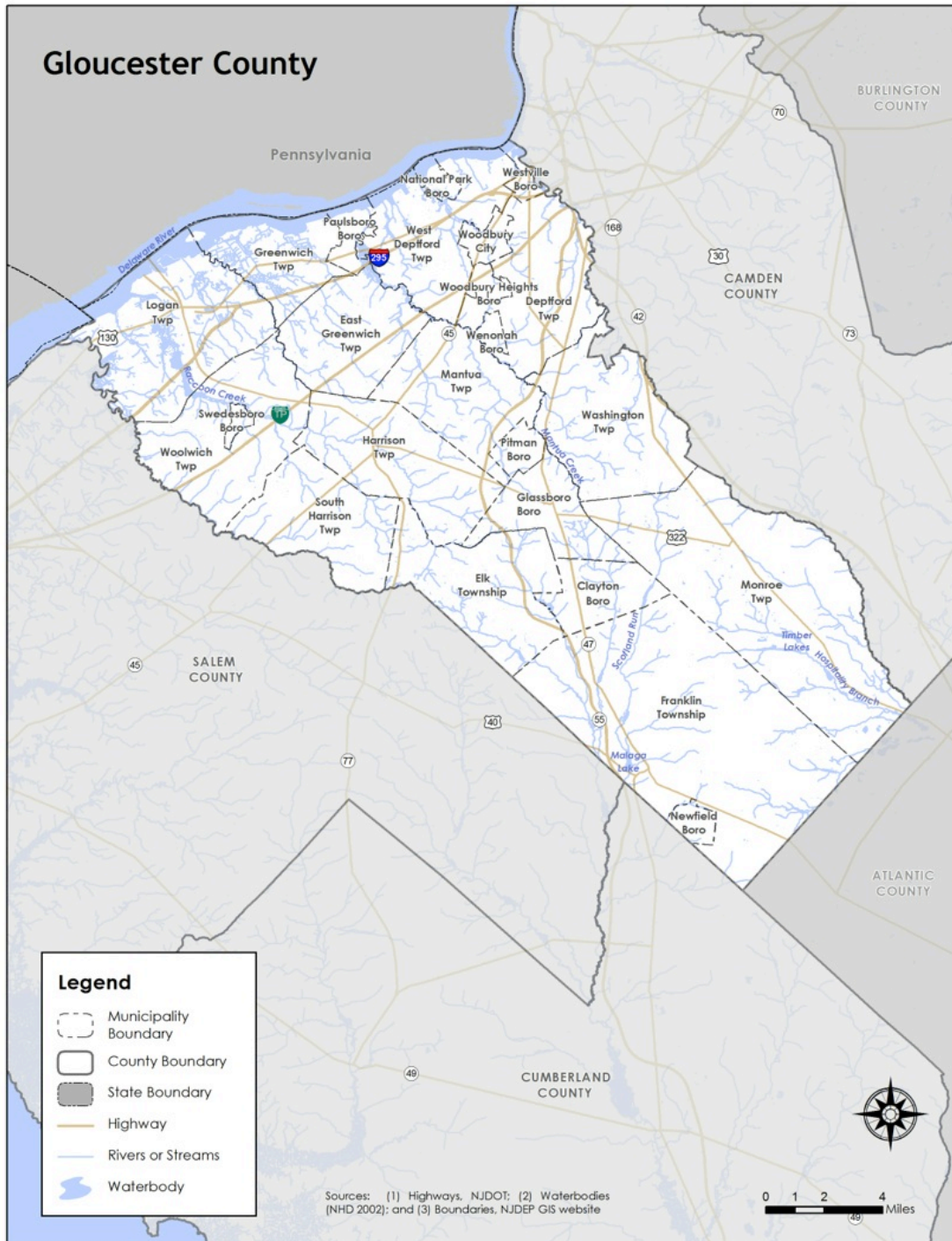
Figure GC.1-1: Gloucester County Location Map



Part 3: Hazard Identification and Risk Assessment

Per Figure GC.1-2, major water courses include the Delaware River which forms the western boundary, Oldmans Creek which forms much of the boundary between Gloucester and Salem Counties and Timber Creek and the Great Egg Harbor River that together form most of the boundary between Gloucester and Camden Counties. Major transportation routes include the New Jersey Turnpike, Interstate 295, US Routes 130 and 322 and New Jersey Routes 45, 47, and 55. The land is predominantly flat with the highest elevation only 180 feet above sea level.

Figure GC.1-2: Gloucester County Base Map



Part 3: Hazard Identification and Risk Assessment

Figure GC.1-2 also shows the 24 cities, townships, and boroughs that are located within Gloucester County. Like the other three counties in the region, Gloucester County includes communities influenced by their proximity to the Delaware River as well as inland municipalities.

The following 23 Gloucester County municipalities participated in the NJ4 HMP planning process:

- Clayton Borough
- Deptford Township
- East Greenwich Township
- Elk Township
- Franklin Township
- Glassboro Borough
- Greenwich Township
- Harrison Township
- Logan Township
- Mantua Township
- Monroe Township
- Newfield Borough
- Paulsboro Borough
- Pitman Borough
- South Harrison Township
- Swedesboro Borough
- Washington Township
- Wenonah Borough
- West Deptford Township
- Westville Borough
- Woodbury City
- Woodbury Heights Borough
- Woolwich Township

The Gloucester County municipalities that participated in the NJ4 HMP planning process were joined by Rowan University, which has its main campus in Glassboro Borough and was an additional participant in the NJ4 HMP planning process. Individual information for each of these participating jurisdictions can be found in their respective Appendices.¹

The community of National Park Borough did not complete the planning process.

¹ See Appendices GC.2 through GC.26.

Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.1-3 is a compilation of demographic information for the county and comparison with the NJ4 HMP region and State of New Jersey.

Table GC.1-3: Gloucester County Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Gloucester County	Region	New Jersey	United States
2000 Population	254,673	974,328	8,414,350	281,421,906
2010 Population	288,288	1,024,926	8,791,894	308,745,538
Percent Change	13.20%	5.19%	4.49%	9.71%
Population Density	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile	87.3 / sq. mile
Land Area	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles	3,534,905.43 sq. miles
% Population < 18 years	24.4	24.1	23.5	24.0
% of Population 18 – 64	63.2	62.7	63.0	63.0
% of Population > 64 years	12.4	13.2	13.5	13.0

Table GC.1-4 illustrates how Gloucester County ranks in the NJ4 HMP region and New Jersey.

Table GC.1-4: Gloucester County Demographic Rankings

	Region (n = 4)	New Jersey (n = 21)
Population Rank	2	14
Land Area Rank	3	10
Population Density Rank	2	13
Population Change Rank	1	-

Table GC.1-5 includes information related to economic and housing statistics for Gloucester County, the NJ4 HMP region, and New Jersey.

Table GC.1-5: Gloucester County Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Gloucester County	Region	New Jersey	United States
Median Household Income	\$72,664	\$60,209	\$69,811	\$51,914
Total Number of Housing Units	109,796	397,990	3,529,033	131,704,730
Occupied Housing Units	104,271	372,472	3,176,069	116,716,292
Vacant Housing Units	5,525	25,518	352,964	14,988,438
Owner Occupied Housing Units	83,525	266,593	2,126,279	75,986,074
Renter Occupied Housing Units	20,746	105,879	1,049,790	40,730,218
Building Permits	716	1,554	13,535	594,800

Part 3: Hazard Identification and Risk Assessment

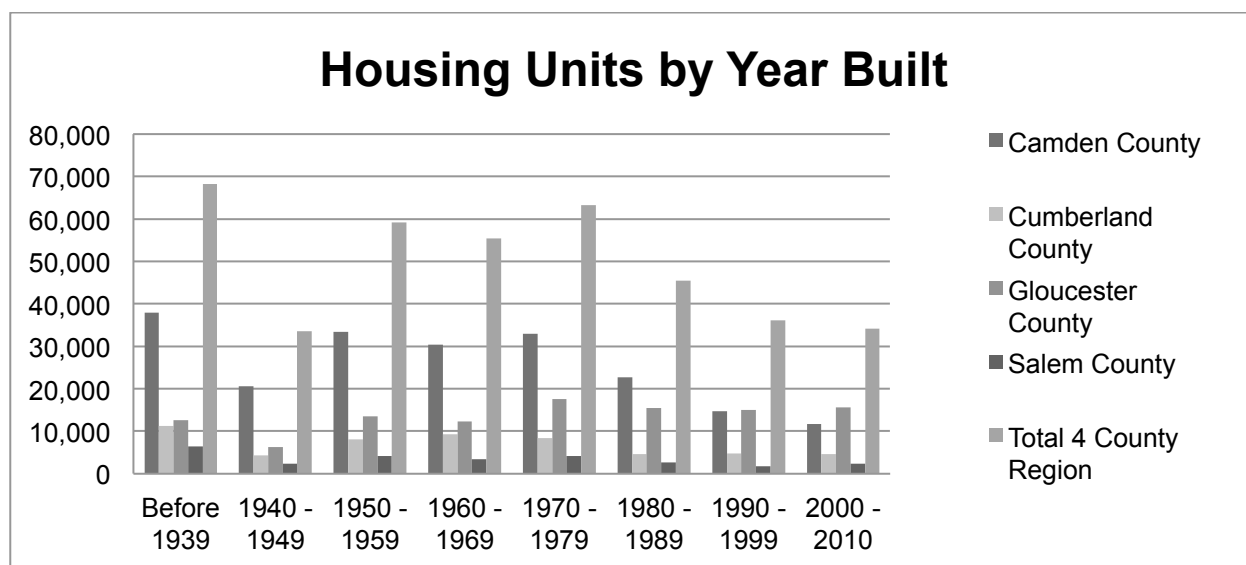
Table GC.1-6 illustrates how Gloucester County ranks in the NJ4 HMP region and New Jersey.

Table GC.1-6: Gloucester County Ranking (Economics and Housing)

	Region (n = 4)	New Jersey (n = 21)
Median Household Income Rank	1	12
Vacant Housing Units Rank	2	17
Renter Occupied Housing Units Rank	2	15
Building Permits Rank	1	7

Figure GC.1-3 illustrates development patterns in the NJ4 HMP region and the individual counties by examining housing units by year built. Gloucester County has had the highest number of units built in a ten-year period only once (1190 to 1999) but has experienced relatively consistent levels of housing development over the more than 70 years of data.

Figure GC.1-3: NJ4 HMP Region Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes a summary of hazard priority determinations per the Municipal Working Groups in Gloucester County.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP² were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified.

The following represents the average hazard ranking for Gloucester County municipalities (in order per average priority):

High Priority

1. Flood
2. High Wind
3. Severe Weather – Summer
4. Severe Weather – Winter

Moderate Priority

5. Extreme Temperature
6. Dam Failure
7. Drought
8. Earthquake

Low Priority

9. Wildfire
10. Coastal Erosion and Sea Level Rise
10. Levee Failure
12. Geologic Hazards

² See Section 3: Hazard Identification and Risk Assessment.

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.1-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Appendices for Gloucester County municipalities and are valid for Gloucester County as a whole. The information represented by these maps will be used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.1-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge)	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where inundation due to storm surge may occur
Table RP.D-81	Levee Failure	Levee Inventory	Provide information about levee configuration
Figure RP.D-85	Levee Failure	Levee Locations	Identify locations of levees in and around the municipality
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the county and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for county critical facilities*
- *Hazard exposure analysis results identified for county critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.1-8 contains updated inventory information for county critical facilities.

Table GC.1-9 provides the means to record results of overlaying critical facility locations with identified hazard inventory information for use in critical site and facility assessments per Mitigation Measure M-2 (see Part 4 of the County Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Winds
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment.

In addition, as part of the implementation of the Gloucester County Appendix, the Gloucester County Working Group will continue to refine the Critical Facility Inventory in Table GC.1-8 per the following:

- The list will be segregated by “Owner/Operator” and circulated to representatives of those Gloucester County departments and agencies to request information to complete any missing entries for the categories listed above as well as the appropriate response for “Shelter (Y/N)”, “Generator (Y/N)”, and “Other?” where the latter column is used to indicate any known hazard exposure (e.g., repetitive flooding, structural concerns, etc.).
- Separate requests will be forwarded to other County agencies and departments with knowledge of other critical or essential facilities within the County that may not appear on the inventory (e.g., facilities caring for vulnerable populations).

The location of any additions to the Critical Facilities Inventory (per Longitude and Latitude) will be compared with the known extent of natural hazards included in the NJ4 HMP. The results of this assessment will be incorporated in Table GC.1-9 and will also be available for use in critical site and facility assessments per Mitigation Measure M-2 (see Part 4 of the County Appendix).

Part 3: Hazard Identification and Risk Assessment
Table GC.1-8: Gloucester County Critical Facilities

April 8, 2016

#	GCCA #	Name	Type	Subtype	Municipality	Owner / Operator	Street	City	County	Shelter (Y/N)	Generator (Y/N)
CF-001P	21	G.C. Animal Shelter	County - Other	Animal Shelters	Clayton Borough	GC AC	1200 North Delsea Drive	Clayton, NJ 08312	Gloucester	N	Y
CF-002P	26	G.C. Government Services	County Administration	Administrative Offices	Clayton Borough	GC B&G	1200 North Delsea Drive	Clayton, NJ 08312	Gloucester	N	Y
CF-003P	27	G.C. Highway Dept- Truck Wash/Brine	Public Works	Maintenance / Work Areas	Clayton Borough	GC B&G	1200 North Delsea Drive	Clayton, NJ 08312	Gloucester	N	N
CF-004P	28	G.C. Highway- Garages/Sign/Welding	Public Works	Maintenance / Work Areas	Clayton Borough	GC B&G	1200 North Delsea Drive	Clayton, NJ 08312	Gloucester	N	N
CF-005P	29	G.C. Highway- Storage/Garage	Public Works	Equipment / Material Storage	Clayton Borough	GC B&G	1200 North Delsea Drive	Clayton, NJ 08312	Gloucester	N	Y
CF-006P	30	G.C. Highway/Public	Public Works	Administrative Offices	Clayton Borough	GC B&G	1200 North Delsea Drive	Clayton, NJ 08312	Gloucester	N	Y
CF-007P	31	G.C. NEW Public Works Pole Barn	Public Works	Equipment / Material Storage	Clayton Borough	GC B&G	1200 North Delsea Drive	Clayton, NJ 08312	Gloucester	N	N
CF-008P	23	G.C. Emergency Vehicle/EMS Bldg	EMS	County Stations	Clayton Borough	GC EMS	1200 North Delsea Drive	Clayton, NJ 08312	Gloucester	N	N
CF-009P	24	G.C. EMS Station 82-9	EMS	County Stations	Clayton Borough	GC EMS	115 E. High Street	Clayton, NJ 08312	Gloucester	N	N
CF-010P	25	G.C. Fleet Man-Motor Pool/Fuel	Public Works	Fueling Stations	Clayton Borough	GC FM	1200 North Delsea Drive	Clayton, NJ 08312	Gloucester	N	Y
CF-011P	35	G.C. Traffic Control/Old Garage	Public Works	Equipment / Material Storage	Clayton Borough	GC HD	1200 North Delsea Drive	Clayton, NJ 08312	Gloucester	N	N
CF-012P	22	G.C. Emergency Response	EOC	Co-located Facilities	Clayton Borough	GC OER	1200 North Delsea Drive	Clayton, NJ 08312	Gloucester	N	Y
CF-013P	32	G.C. Scotland Run Park -	Parks & Recreational	Equipment / Material Storage	Clayton Borough	GC P&R	980 Academy Street	Clayton, NJ 08312	Gloucester	N	N
CF-014P	33	G.C. Scotland Run Park-Office/Nature	Parks & Recreational	Administrative Offices	Clayton Borough	GC P&R	980 Academy Street	Clayton, NJ 08312	Gloucester	N	N
CF-015P	34	G.C. Scotland Run Park-Ranger Office/Garage	Parks & Recreational Facilities	Administrative Offices	Clayton Borough	GC P&R	980 Academy Street	Clayton, NJ 08312	Gloucester	N	N
CF-016P	36	GCUA Clayton Pump Station	Utilities - Wastewater	Pump Stations	Clayton Borough	GCUA	Bernard Street and Washington Avenue	Clayton, NJ 08312	Gloucester	N	Y
CF-017P	37	G.C. Adult Probation	Law Enforcement Facilities	Administrative Offices	Deptford Township	GC B&G	1885 Hurffville Road	Deptford, NJ 08096	Gloucester	N	Y
CF-018P	38	G.C. Child Support Enforcement	Law Enforcement Facilities	Administrative Offices	Deptford Township	GC B&G	1893 Hurffville Road	Deptford, NJ 08096	Gloucester	N	Y
CF-019P	39	G.C. Juvenile Probation	Law Enforcement Facilities	Administrative Offices	Deptford Township	GC B&G	1893 Hurffville Road	Deptford, NJ 08096	Gloucester	N	Y
CF-020P	40	GCUA Deptford Pump Station	Utilities - Wastewater	Pump Stations	Deptford Township	GCUA	Murphy Avenue	Deptford, NJ 08096	Gloucester	N	Y
CF-021P	41	GCUA Cooper Street Metering	Utilities - Wastewater	Metering Stations	Deptford Township	GCUA	Cooper Street & Stonybrook Drive	Deptford, NJ 08096	Gloucester	N	N
CF-022P	42	GCUA Cove Rd. Dept. Twp. Metering Station # 24	Utilities - Wastewater	Metering Stations	Deptford Township	GCUA	Cove Road near Route 45	Deptford, NJ 08096	Gloucester	N	N
CF-023P	43	GCUA Cove Rd Metering Station # 24	Utilities - Wastewater	Metering Stations	Deptford Township	GCUA	Cove Road	Deptford, NJ 08096	Gloucester	N	N
CF-024P	3	G.C. B&G "A" BLDG 1 BAY	Weights & Measures	Vehicle Storage	East Greenwich Township	GC B&G	256 County House Road	Clarksboro, NJ 08020	Gloucester	N	N
CF-025P	10	G.C. Toys for Tots	County - Other	Storage Facility	East Greenwich Township	GC B&G	210 County House Road	Clarksboro, NJ 08020	Gloucester	N	N
CF-026P	17	G.C. B&G "A" BLDG 5 BAY	Buildings & Grounds	Storage Facility	East Greenwich Township	GC B&G	256 County House Road	Clarksboro, NJ 08021	Gloucester	N	N
CF-027P	18	G.C. B&G "D" 2 Story Maint Shop	Public Works	Maintenance / Work Areas	East Greenwich Township	GC B&G	256 County House Road	Clarksboro, NJ 08022	Gloucester	N	Y

Part 3: Hazard Identification and Risk Assessment
Table GC.1-8: Gloucester County Critical Facilities

April 8, 2016

#	GCCA #	Name	Type	Subtype	Municipality	Owner / Operator	Street	City	County	Shelter (Y/N)	Generator (Y/N)
CF-028P	19	G.C. B&G "H" 4 Bay Storage Bldg	Public Works	Equipment / Material Storage	East Greenwich Township	GC B&G	256 County House Road	Clarksboro, NJ 08023	Gloucester	N	N
CF-029P	20	G.C. Bldg & Grnds "B1" 2 Bay Supply	Public Works	Equipment / Material Storage	East Greenwich Township	GC B&G	256 County House Road	Clarksboro, NJ 08024	Gloucester	N	N
CF-030P	4	G.C. EMS Station 82-3	EMS	County Stations	East Greenwich Township	GC EMS	21 E. Cohawkin Road	Clarksboro, NJ 08020	Gloucester	N	N
CF-031P	6	G.C. Fire Marshal's Office	FireStation	Administrative Offices	East Greenwich Township	GC OER	212 County House Road	Clarksboro, NJ 08020	Gloucester	N	N
CF-032P	7	G.C. Communications	Communications	Communications Towers	East Greenwich Township	GC OER	212 County House Road	Clarksboro, NJ 08020	Gloucester	N	Y
CF-033P	8	G.C. Neptune Building "B2" 2 Bay	Other County	Vehicle Storage	East Greenwich Township	GC OER	256 County House Road	Clarksboro, NJ 08020	Gloucester	N	N
CF-034P	9	G.C. North Radio Tower Building	Communications	Communications Towers	East Greenwich Township	GC OER	200 County House Road	Clarksboro, NJ 08020	Gloucester	N	Y
CF-035P	11	G.C.I.A. Shady Lane - Child	Vulnerable Populations	Public Child Day Care	East Greenwich Township	GCIA	256 County House Road	Clarksboro, NJ 08020	Gloucester	N	Y
CF-036P	12	G.C.I.A. Shady Lane - Nursing	Vulnerable Populations	Public Nursing Homes	East Greenwich Township	GCIA	256 County House Road	Clarksboro, NJ 08020	Gloucester	Medical Needs	Y
CF-037P	13	G.C.I.A. Shady Lane - Office	County - Other	Administrative Offices	East Greenwich Township	GCIA	254 County House Road	Clarksboro, NJ 08020	Gloucester	N	Y
CF-038P	14	GCPO "C1" 2 Bay Cmmnd Veh/Boat	Law Enforcement Facilities	Equipment / Material Storage	East Greenwich Township	GCPO	256 County House Road	Clarksboro, NJ 08020	Gloucester	N	N
CF-039P	15	GCPO "C2" Evidence Storage	Law Enforcement Facilities	Equipment / Material Storage	East Greenwich Township	GCPO	256 County House Road	Clarksboro, NJ 08020	Gloucester	N	N
CF-040P	16	GCPO "I" 6 Bay Vehicle Storage	Law Enforcement Facilities	Equipment / Material Storage	East Greenwich Township	GCPO	256 County House Road	Clarksboro, NJ 08020	Gloucester	N	N
CF-041P	44	GCUA Mantua Creek Pump Station	Utilities - Wastewater	Pump Stations	East Greenwich Township	GCUA	70 Mantua-Paulsboro Road	East Greenwich NJ 08020	Gloucester	N	Y
CF-042P	45	GCUA Greenwich Crossing Metering	Utilities - Wastewater	Metering Stations	East Greenwich Township	GCUA	Rear of 178 Sunset Drive	East Greenwich NJ 08020	Gloucester	N	N
CF-043P	46	GCUA Harmony Acres Metering	Utilities - Wastewater	Metering Stations	East Greenwich Township	GCUA	Paulsboro-Mantua Road	East Greenwich NJ 08020	Gloucester	N	N
CF-044P	47	GCUA Weathervane Metering Station	Utilities - Wastewater	Metering Stations	East Greenwich Township	GCUA	Billows Avenue	East Greenwich NJ 08020	Gloucester	N	N
CF-045P	48	GCUA Mantua Creek Storage Facility	Utilities - Wastewater	Storage Facility	East Greenwich Township	GCUA	70 Mantua-Paulsboro Road	East Greenwich NJ 08020	Gloucester	N	N
CF-046P	5	G.C. Fire Academy	FireStation	Training Centers	East Greenwich Township	RC GC	200 County House Road	Clarksboro, NJ 08020	Gloucester	Y	Y
CF-047P	63	Gloucester County Regional Salt Facility	Public Works	Equipment / Material Storage	Franklin Township	GC HD	234 Broad Street	Malaga, NJ 08322	Gloucester	N	N
CF-048P	51	G.C. Library Commission - Glassboro	County - Other	Library	Glassboro Borough	GC LC	2 Center Street	Glassboro, NJ 08028	Gloucester	Cooling Center	N
CF-049P	52	GCUA Autumn Ridge Metering	Utilities - Wastewater	Metering Stations	Glassboro Borough	GCUA	Autumn Ridge Drive off Route 47	Glassboro, NJ 08028	Gloucester	N	N
CF-050P	53	GCUA Doubletree Metering Station # 42	Utilities - Wastewater	Metering Stations	Glassboro Borough	GCUA	Dogwood Avenue near Greentree Road	Glassboro, NJ 08028	Gloucester	N	N
CF-051P	54	GCUA Birches Metering Station # 21	Utilities - Wastewater	Metering Stations	Glassboro Borough	GCUA	Lakeside Drive	Glassboro, NJ 08028	Gloucester	N	N

Part 3: Hazard Identification and Risk Assessment
Table GC.1-8: Gloucester County Critical Facilities

April 8, 2016

#	GCCA #	Name	Type	Subtype	Municipality	Owner / Operator	Street	City	County	Shelter (Y/N)	Generator (Y/N)
CF-052P	55	GCUA Glassboro Metering Station # 26	Utilities - Wastewater	Metering Stations	Glassboro Borough	GCUA	Looney Drive	Glassboro, NJ 08028	Gloucester	N	N
CF-053P	56	GCUA Monroe Metering Station	Utilities - Wastewater	Metering Stations	Glassboro Borough	GCUA	US Route 322	Glassboro, NJ 08028	Gloucester	N	N
CF-054P	57	GCUA Stanger Avenue Pump Station	Utilities - Wastewater	Pump Stations	Glassboro Borough	GCUA	Stanger Avenue	Glassboro, NJ 08028	Gloucester	N	Y
CF-055P	58	GCUA Whethersfield Metering Station # 4	Utilities - Wastewater	Metering Stations	Glassboro Borough	GCUA	Whethersfield Drive	Glassboro, NJ 08028	Gloucester	N	N
CF-056P	50	G.C. Library Commission - Greenwich Twp	County - Other	Library	Greenwich Township	GC LC	411 Swedesboro Road	Gibbstown, NJ 08027	Gloucester	Cooling Center	N
CF-057P	49	G.C. Greenwich Lake & Bldgs	Parks & Recreational Facilities	Parks	Greenwich Township	GC P&R	Tomlin Station Road	Gibbstown, NJ 08027	Gloucester	N	N
CF-058P	80	G.C. 4-H Fair Grounds	County - Other	Fairgrounds	Harrison Township	GC 4H	275 Bridgeton Pike	Mullica Hill, NJ 08062	Gloucester	N	N
CF-059P	81	G.C. Library Commission - Harrison	County - Other	Library	Harrison Township	GC LC	389 Wolfert Station Road	Mullica Hill, NJ 08062	Gloucester	Cooling Center	N
CF-060P	82	GCUA Rowan Tech Park Metering Station	Utilities - Wastewater	Metering Stations	Harrison Township	GCUA	107 Gilbreth Parkway	Mullica Hill, NJ 08062	Gloucester	N	N
CF-061P	1	G.C. EMS Station 82-1	EMS	County Stations	Logan Township	GC EMS	49 Coontown Road	Bridgeport, NJ 08014	Gloucester	N	N
CF-062P	62	G.C. Library Commission - Logan	County - Other	Library	Logan Township	GC LC	498 Beckett Road	Logan Township, NJ 08085	Gloucester	Cooling Center	N
CF-063P	2	G.C.I.A. Dream Park	County - Other	Equestrian Centers	Logan Township	GCIA	1500 US Route 130	Bridgeport, NJ 08014	Gloucester	N	N
CF-064P	72	G.C. EMS Station 82-6	EMS	County Stations	Mantua Township	GC EMS	411 Main Street	Mantua, NJ 08051	Gloucester	N	N
CF-065P	73	G.C. Fleet Management - Mantua	Public Works	Combined Administrative Office, Maintenance	Mantua Township	GC FM	45 Lenape Trail	Mantua, NJ 08052	Gloucester	N	Y
CF-066P	74	G.C. Fleet Management - Mantua Storage	Public Works	Equipment / Material Storage	Mantua Township	GC FM	45 Lenape Trail	Mantua, NJ 08052	Gloucester	N	N
CF-067P	64	Gloucester County Regional Salt	Public Works	Equipment / Material Storage	Mantua Township	GC HD	401 Main Street	Mantua, NJ 08051	Gloucester	N	N
CF-068P	75	G.C. Highway Department - Mantua	Public Works	Combined Administrative Office, Maintenance	Mantua Township	GC HD	45 Lenape Trail	Mantua, NJ 08052	Gloucester	N	Y
CF-069P	100	G.C. Atkinson Park Ranger Station	Parks & Recreational Facilities	Administrative Offices	Mantua Township	GC P&R	Delsea Drive & Bethel Mill Rd.	Sewell, NJ 08080	Gloucester	N	N

#	GCCA #	Name	Type	Subtype	Municipality	Owner / Operator	Street	City	County	Shelter (Y/N)	Generator (Y/N)
CF-070P	122	G.C. Atkinson Park Theater	Parks & Recreational Facilities	Theaters	Mantua Township	GC P&R	Delsea Drive & Bethel Mill Rd.	Sewell, NJ 08081	Gloucester	N	N
CF-071P	121	G.C. Atkinson Park Office	Parks & Recreational Facilities	Administrative Offices	Mantua Township	GC P&R	Delsea Drive & Bethel Mill Rd.	Sewell, NJ 08081	Gloucester	N	N
CF-072P	71	G.C. Pitman Golf Course	Parks & Recreational Facilities	Golf Courses	Mantua Township	GC P&R	501 Pitman Road	Mantua, NJ 08020	Gloucester	N	N
CF-073P	99	G.C. Atkinson Park Concession	Parks & Recreational Facilities	Concessions	Mantua Township	GC P&R	Delsea Drive & Bethel Mill Rd.	Sewell, NJ 08080	Gloucester	N	N
CF-074P	118	G.C. Social Services	County - Other	Administrative Offices	Mantua Township	GC SS	400 Holly Dell Road	Sewell, NJ 08080	Gloucester	N	N
CF-075P	120	G.C. Veterans Offices at 5 Points	County - Other	Administrative Offices	Mantua Township	GC VA	211 County House Road	Sewell, NJ 08080	Gloucester	N	N
CF-076P	119	G.C. Special Services School Dist	Schools	Administrative Offices	Mantua Township	GC VTSC	1340 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-077P	117	G.C. Institute of Technology	Schools	Public - Higher Education	Mantua Township	GC VTSC	1360 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-078P	65	GCUA Berkley Village Metering Station # 40	Utilities - Wastewater	Metering Stations	Mantua Township	GCUA	Berkley Avenue	Mantua, NJ 08051	Gloucester	N	N
CF-079P	66	GCUA Country Garden Metering Station	Utilities - Wastewater	Metering Stations	Mantua Township	GCUA	monarch cout	Mantua, NJ 08051	Gloucester	N	N
CF-080P	67	GCUA Crescent Hollow Metering Station # 41	Utilities - Wastewater	Metering Stations	Mantua Township	GCUA	Crescent Hollow Drive	Mantua, NJ 08051	Gloucester	N	N
CF-081P	68	GCUA GCVS-Timbercrest	Utilities - Wastewater	Metering Stations	Mantua Township	GCUA	Sewell Road	Mantua, NJ 08051	Gloucester	N	N
CF-082P	69	GCUA Jessup Mill Metering Station #	Utilities - Wastewater	Metering Stations	Mantua Township	GCUA	Jessup Mill Road	Mantua, NJ 08051	Gloucester	N	N
CF-083P	70	GCUA Mantua Improvemnt Assoc.	Utilities - Wastewater	Metering Stations	Mantua Township	GCUA	Wenonah Avenue	Mantua, NJ 08051	Gloucester	N	N
CF-084P	96	GCUA Buckingham Metering Station # 23	Utilities - Wastewater	Metering Stations	Mantua Township	GCUA	Atlantic Avenue	Sewell, NJ 08080	Gloucester	N	N
CF-085P	97	GCUA Miller's Drive Metering Station # 30	Utilities - Wastewater	Metering Stations	Mantua Township	GCUA	Miller's Drive	Sewell, NJ 08080	Gloucester	N	N
CF-086P	98	GCUA Parke Place Metering Station # 45	Utilities - Wastewater	Metering Stations	Mantua Township	GCUA	Brandon Avenue	Sewell, NJ 08080	Gloucester	N	N
CF-087P	95	GCUA BelleMeade Metering Station # 39	Utilities - Wastewater	Metering Stations	Mantua Township	GCUA	Burlington Avenue	Sewell, NJ 08080	Gloucester	N	N
CF-088P	101	G.C. College - College Center	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	Y	Y
CF-089P	102	G.C. College - Continuing	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1492 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-090P	103	G.C. College - Day Care Center	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-091P	104	G.C. College - Fine Arts Center	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-092P	105	G.C. College - Health Sciences	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y

#	GCCA #	Name	Type	Subtype	Municipality	Owner / Operator	Street	City	County	Shelter (Y/N)	Generator (Y/N)
CF-093P	106	G.C. College - Herbert Building	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	Blackwood/Barnsboro Road	Sewell, NJ 08080	Gloucester	N	Y
CF-094P	107	G.C. College - Ice House	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-095P	108	G.C. College - Instructional Center	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-096P	109	G.C. College - Library & LRC	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-097P	110	G.C. College - Physical Education	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	Y	Y
CF-098P	111	G.C. College - Plant Operations	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-099P	112	G.C. College - Police Academy	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-100P	113	G.C. College - Safety/Security	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-101P	114	G.C. College - Scott Hall	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-102P	115	G.C. College - Student Services	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-103P	116	G.C. College - University Center	Schools	Public - Higher Education Facilities	Mantua Township	RC GC	1400 Tanyard Road	Sewell, NJ 08080	Gloucester	N	Y
CF-104P	78	G.C. Veteran's Cemetery - Visitor's Center	County - Other	Cemetery	Monroe Township	GC B&G	240 South Tuckahoe Road	Monroe Township NJ 08094	Gloucester	N	N
CF-105P	79	G.C. Veterans Cemetery - Maintenance Shop	County - Other	Cemetery	Monroe Township	GC B&G	240 South Tuckahoe Road	Monroe Township NJ 08094	Gloucester	N	N
CF-106P	77	G.C. Veteran's Cemetery - Committal Bldg	County - Other	Cemetery	Monroe Township	GC B&G	240 South Tuckahoe Road	Monroe Township NJ 08094	Gloucester	N	N
CF-107P	76	GCUA Upper Mantua Pump Station	Utilities - Wastewater	Pump Stations	Monroe Township	GCUA	Pitman-Downer Rd. and Fries Mill Road	Monroe Township NJ 08094	Gloucester	N	Y
CF-108P	86	G.C. Redbank Battlefield-Ranger Office	Parks & Recreational Facilities	Administrative Offices	National Park Borough	GC P&R	100 Hessian Avenue	National Park, NJ 08063	Gloucester	N	N
CF-109P	87	G.C. Redbank Battlefield-Whithall House	Parks & Recreational Facilities	Administrative Offices	National Park Borough	GC P&R	100 Hessian Avenue	National Park, NJ 08063	Gloucester	N	N
CF-110P	85	G.C. Redbank Battlefield-Garage	Parks & Recreational	Equipment / Material Storage	National Park Borough	GC P&R	100 Hessian Avenue	National Park, NJ 08063	Gloucester	N	N
CF-111P	83	GCUA National Park Pump Station	Utilities - Wastewater	Pump Stations	National Park Borough	GCUA	Grove Avenue	National Park, NJ 08063	Gloucester	N	Y
CF-112P	84	GCUA National Park Storage Facility	Utilities - Wastewater	Storage Facility	National Park Borough	GCUA	Grove Road	National Park, NJ 08063	Gloucester	N	Y
CF-113P	88	G.C. Health Clinic - WIC	Health Care Facilities	Public Health Clinic / Treatment Centers	Paulsboro Borough	GC H&SS	1000 Delaware Street	Paulsboro, NJ 08066	Gloucester	N	N
CF-114P	89	GCUA Paulsboro Pump Station	Utilities - Wastewater	Pump Stations	Paulsboro Borough	GCUA	East Adams Street	Paulsboro, NJ 08066	Gloucester	N	Y

Part 3: Hazard Identification and Risk Assessment
Table GC.1-8: Gloucester County Critical Facilities

April 8, 2016

#	GCCA #	Name	Type	Subtype	Municipality	Owner / Operator	Street	City	County	Shelter (Y/N)	Generator (Y/N)
CF-115P	90	G.C. EMS Station 82-7	EMS	County Stations	Pitman Borough	GC EMS	199 West Avenue.	Pitman NJ 08071	Gloucester	N	N
CF-116P	91	GCUA Carew Avenue Metering Station	Utilities - Wastewater	Metering Stations	Pitman Borough	GCUA	Carew Avenue	Pitman NJ 08071	Gloucester	N	N
CF-117P	92	GCUA PITMAN REUSE TREATMENT PLANT	Utilities - Wastewater	Treatment Plants	Pitman Borough	GCUA	ACROSS FROM 161 LAMBS ROAD	Pitman NJ 08071	Gloucester	N	Y
CF-118P	93	GCUA Pitman East Metering Station # 31	Utilities - Wastewater	Metering Stations	Pitman Borough	GCUA	Muriel Avenue	Pitman NJ 08071	Gloucester	N	N
CF-119P	94	GCUA Pitman Metering Station # 32	Utilities - Wastewater	Metering Stations	Pitman Borough	GCUA	Maple Avenue	Pitman NJ 08071	Gloucester	N	N
CF-120P	59	G.C. EMS Station 83-2	EMS	County Stations	South Harrison Township	GC EMS	664 Harrisonville Road	Harrisonville, NJ 08039	Gloucester	N	N
CF-121P	60	G.C.I.A. - Landfill	Utilities - Solid Waste	Landfill	South Harrison Township	GCIA	493 Monroeville Road	Harrisonville, NJ 08039	Gloucester	N	Y
CF-122P	61	G.C.I.A. - Landfill Office	Utilities - Solid Waste	Administrative Offices	South Harrison Township	GCIA	503 Monroeville Road	Harrisonville, NJ 08039	Gloucester	N	Y
CF-123P	123	G.C. Highway Department - Swedesboro	Public Works	Combined Administrative Office, Maintenance	Swedesboro Borough	GC HD	141 Glen Echo Avenue	Swedesboro, NJ 08085	Gloucester	N	N
CF-124P	124	G.C. Library Commission - Swedesboro	County - Other	Library	Swedesboro Borough	GC LC	1442 Kings Highway	Swedesboro, NJ 08085	Gloucester	Cooling Center	N
CF-125P	127	G.C. Health & Senior Services	Health Care Facilities	Administrative Offices	Washington Township	GC H&SS	204 East Holly Avenue	Turnersville, NJ 08012	Gloucester	N	N
CF-126P	128	Gloucester County Regional Salt Facility	Public Works	Equipment / Material Storage	Washington Township	GC HD	2 McClure Drive	Turnersville, NJ 08012	Gloucester	N	N
CF-127P	129	GCUA Shoppers Lane Pump Station	Utilities - Wastewater	Pump Stations	Washington Township	GCUA	Shoppers Lane Road near	Turnersville, NJ 08012	Gloucester	N	Y
CF-128P	130	GCUA Whitman Square Pump Station	Utilities - Wastewater	Pump Stations	Washington Township	GCUA	152 Whitman Drive	Turnersville, NJ 08012	Gloucester	N	Y
CF-129P	132	GCUA Oak Valley-Wenonah Metering Station	Utilities - Wastewater	Metering Stations	Wenonah Borough	GCUA	Hayes Avenue	Wenonah, NJ 08090	Gloucester	N	N
CF-130P	141	G.C. Budd Blvd. Complex	County - Other	Administrative Offices	West Deptford Township	GC B&G	115 Budd Blvd	West Deptford, NJ 08096	Gloucester	N	N
CF-131P	140	G.C. Board of Elections	County - Other	Administrative Offices	West Deptford Township	GC BOE	550 Grove Road	West Deptford, NJ 08096	Gloucester	N	Y
CF-132P	125	G.C. EMS Station 82-4	EMS	County Stations	West Deptford Township	GC EMS	794 Grove Road	Thorofare, NJ 08066	Gloucester	N	N
CF-133P	131	G.C. EMS Station 82-5	EMS	County Stations	West Deptford Township	GC EMS	1267 Hessian Avenue	Verga, NJ 08093	Gloucester	N	N
CF-134P	139	Gloucester County Regional Salt Facility	Public Works	Equipment / Material Storage	West Deptford Township	GC HD	Jobstown Road	West Deptford, NJ 08086	Gloucester	N	N

#	GCCA #	Name	Type	Subtype	Municipality	Owner / Operator	Street	City	County	Shelter (Y/N)	Generator (Y/N)
CF-135P	126	G.C. Sheriff's Office - Field Ops Unit	Law Enforcement Facilities	Stations	West Deptford Township	GC OER	550 Grove Road	Thorofare, NJ 08066	Gloucester	N	Y
CF-136P	142	G.C.I.A. - Admin. Offices	County - Other	Administrative Offices	West Deptford Township	GCIA	109 Budd Blvd.	West Deptford, NJ 08096	Gloucester	N	N
CF-137P	133	GCUA Administration	Utilities - Wastewater	Administrative Offices	West Deptford Township	GCUA	2 Paradise Road	West Deptford, NJ 08066	Gloucester	N	Y
CF-138P	134	GCUA WASTE WATER TREATMENT	Utilities - Wastewater	Treatment Plants	West Deptford Township	GCUA	2 Paradise Road	West Deptford, NJ 08066	Gloucester	N	Y
CF-139P	135	GCUA Forest Park Metering Station	Utilities - Wastewater	Metering Stations	West Deptford Township	GCUA	Forest Parkway	West Deptford, NJ 08066	Gloucester	N	N
CF-140P	136	GCUA Grant Avenue Metering Station # 27	Utilities - Wastewater	Metering Stations	West Deptford Township	GCUA	Grant Avenue	West Deptford, NJ 08066	Gloucester	N	N
CF-141P	137	GCUA West First Avenue Metering Station # 24	Utilities - Wastewater	Metering Stations	West Deptford Township	GCUA	First Avenue	West Deptford, NJ 08066	Gloucester	N	N
CF-142P	138	GCUA West Deptford-Woodbury Metering Station	Utilities - Wastewater	Metering Stations	West Deptford Township	GCUA	Francis Avenue	West Deptford, NJ 08066	Gloucester	N	N
CF-143P	143	GCUA Westville Pump Station	Utilities - Wastewater	Pump Stations	Westville Borough	GCUA	5 th and Woodbine Avenue	Westville NJ 08093	Gloucester	N	Y
CF-144P	144	GCUA Wheelabrator Signal Resco	Utilities - Wastewater	Metering Stations	Westville Borough	GCUA	RT 130 AND HAZEL	Westville NJ 08093	Gloucester	N	N
CF-145P	145	G.C. Administration Building	County Administration	Administrative Offices	Woodbury City	GC B&G	2 South Broad Street	Woodbury, NJ 08096	Gloucester	N	Y
CF-146P	148	G.C. Historical Society - Annex	County - Other	Museum	Woodbury City	GC B&G	62 North Broad Street	Woodbury, NJ 08096	Gloucester	N	N
CF-147P	149	G.C. Historical Society - Library	County - Other	Museum	Woodbury City	GC B&G	17 Hunter Street	Woodbury, NJ 08096	Gloucester	Cooling Center	N
CF-148P	150	G.C. Historical Society - Museum	County - Other	Museum	Woodbury City	GC B&G	58 North Broad Street	Woodbury, NJ 08096	Gloucester	N	N
CF-149P	151	G.C. Justice Center Courts	Law Enforcement Facilities	Courts	Woodbury City	GC B&G	70 Hunter Street	Woodbury, NJ 08096	Gloucester	N	Y
CF-150P	152	G.C. Justice Center Jail	Law Enforcement Facilities	Correctional Facilities	Woodbury City	GC B&G	70 Hunter Street	Woodbury, NJ 08096	Gloucester	N	Y
CF-151P	153	G.C. Justice Complex - Parking Garage	Law Enforcement Facilities	Parking Garage	Woodbury City	GC B&G	Broad & Hunter Streets	Woodbury, NJ 08096	Gloucester	N	Y
CF-152P	154	G.C. Justice Ctr. - Prosecutor's Office	Law Enforcement Facilities	Administrative Offices	Woodbury City	GC B&G	70 Hunter Street	Woodbury, NJ 08096	Gloucester	N	Y
CF-153P	155	G.C. Old Court House	Law Enforcement Facilities	Courts	Woodbury City	GC B&G	1 North Broad Street	Woodbury, NJ 08096	Gloucester	N	Y
CF-154P	156	G.C. Surrogate's Office	Law Enforcement Facilities	Administrative Offices	Woodbury City	GC B&G	1 North Broad Street	Woodbury, NJ 08096	Gloucester	N	Y
CF-155P	147	G.C. Administration Parking Garage	County Administration	Parking Garage	Woodbury City	GC B&G	Cooper Street	Woodbury, NJ 08096	Gloucester	N	N

#	GCCA #	Name	Type	Subtype	Municipality	Owner / Operator	Street	City	County	Shelter (Y/N)	Generator (Y/N)
CF-156P	146	G.C. EMS Station 83-1	EMS	County Stations	Woodbury City	GC EMS	637 Broad Street	Woodbury, NJ 08096	Gloucester	N	N
CF-157P	157	GCUA Warren Street Pump Station	Utilities - Wastewater	Pump Stations	Woodbury City	GCUA	North Warren Street	Woodbury, NJ 08096	Gloucester	N	Y
CF-158P	158	GCUA Warren Street Pump Metering Station	Utilities - Wastewater	Pump Stations	Woodbury City	GCUA	North Warren Street	Woodbury, NJ 08096	Gloucester	N	N
CF-159P	159	GCUA Braun Court Metering Station #22	Utilities - Wastewater	Metering Stations	Woodbury City	GCUA	Redbank Avenue	Woodbury, NJ 08096	Gloucester	N	N
CF-160P	160	GCUA Redbank Metering Station # 33	Utilities - Wastewater	Metering Stations	Woodbury City	GCUA	Redbank Avenue	Woodbury, NJ 08096	Gloucester	N	N
CF-161P	161	GCUA Woodbury Heights Metering Station # 36	Utilities - Wastewater	Metering Stations	Woodbury City	GCUA	South Evergreen Avenue	Woodbury, NJ 08096	Gloucester	N	N
CF-162P	162	G.C. EMS Station 82-2	EMS	County Stations	Woolwich Township	GC EMS	124 Woodstown Road	Woolwich Township, NJ 08085	Gloucester	N	N
CF-163P	163	Gloucester County Regional Salt Facility	Public Works	Equipment / Material Storage	Woolwich Township	GC HD	222 Woodstown Rd.	Woolwich Township, NJ 08085	Gloucester	N	N

Part 3: Hazard Identification and Risk Assessment

Table GC.1-8 Legend

GC AC	Gloucester County Animal Control	GC VA	Gloucester County Office of Veterans Affairs
GC BOE	Gloucester County Board of Elections	GC VTSC	Gloucester County Vocational-Technical School District
GC B&G	Gloucester County Building & Grounds	GC 4H	Gloucester County 4-H
GC EMS	Gloucester County Emergency Medical Services	RC GC	Rowan College of Gloucester County
GC FM	Gloucester County Fleet Management		
GC H&SS	Gloucester County Health and Senior Services		
GC HD	Gloucester County Highway Department		
GCIA	Gloucester County Improvement Authority		
GC OER	Gloucester County Office of Emergency Response		
GC LC	Gloucester County Library Commission		
GC P&R	Gloucester County Parks & Recreation		
GCPO	Gloucester County Prosecutors Office		
GC SS	Gloucester County Social Services		
GCUA	Gloucester County Utilities Authority		

Table GC.1-9: Gloucester County Critical Facilities Hazard Exposure¹

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1															

¹ Results for the Critical Facility Exposure Analysis for all hazards will be included as part of Mitigation Measure M-2.

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the County Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the County's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the County Working Group for use in the County Appendix. All mitigation measures included in the County Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the County Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as initial risk reduction efforts
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Work with Municipal OEMs, engineering, and public works officials to resolve multi-jurisdictional mitigation measures
- Work with Municipal OEMs to provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Institutionalize hazard mitigation into Municipal and County activities and programs through regular interactions of the Municipal and County Working Groups and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the Municipal and County mitigation programs

The mitigation measures described in Part 4.3 of the County Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes an overview of recent accomplishments for the county's hazard mitigation program.

The SDVR HMPs contained many specific mitigation measures for municipalities. The respective municipalities implemented some of the measures and several more were slated for implementation when the NJ4 HMP was developed in 2014 and 2015. Other municipal mitigation measures were deferred for a range of reasons. In the NJ4 HMP, many of the deferred measures were still considered valid by the Municipal Working Groups and carried over as part of the Municipal Appendices.¹ The nature of the mitigation measures identified for the four counties in the SDVR was quite different but the outcome was similar; some measures were implemented while others were deferred and are included in the County Appendices.

Mitigation measures identified for the four counties focused on programmatic support for their constituent municipalities. The measures closely mirrored the four goals of the project. The following provides examples of the types of mitigation measures that were attributed to each of the goals:

- Goal 1: Improve education and outreach efforts
 - Conduct yearly workshops related to FEMA hazard mitigation grant programs for local government officials
- Goal 2: Improve data collection, use, and sharing
 - Develop and maintain relationships with organizations that can provide technical assistance in the areas of hazard identification and risk assessment
- Goal 3: Improve capabilities and coordination
 - Encourage municipalities to participate in the CRS program, including potentially setting up CRS site visits and/or workshops for interested jurisdictions
- Goal 4: Plan and implement projects
 - Implement mitigation projects and programs intended to reduce risk to critical facilities

These are just a few examples. The program laid out in the SDVR HMPs included a wide variety of detailed actions and programs. Most of the responsibility for implementing the program fell to the County Offices of Emergency Management (OEM) and there were successes during the implementation of the SDVR HMP. Table GC.1-10 identifies representative activities, programs, and projects that were undertaken during this period by Gloucester County.

Table GC.1-10: Gloucester County Mitigation Program Accomplishments

Mitigation Action, Program, or Project	Comments
General hazard mitigation support for Municipal OEM Coordinators.	Gloucester County OEM has held regularly scheduled quarterly meetings for several years. Hazard mitigation is a regular component of the agendas for the Municipal OEM Coordinator Meetings including recommendations for implementation of the SDVR HMP and work-in-progress for the NJ HMP in 2014 and 2015.

¹ See *Part 4.2: SDVR HMP Mitigation Measures* of Appendices GC.2 through GC.26 for descriptions of the disposition of these municipal mitigation measures.

Part 4: Mitigation Measures

Mitigation Action, Program, or Project	Comments
Support for municipal grant applications for FEMA HMA grant programs including those initiated following Superstorm Sandy.	Several LOIs were submitted for Gloucester County municipalities, coordinated through Gloucester County OEM. Three of these projects are pending decisions by NJOEM and FEMA as of April 17, 2015.
Support for long-term recovery planning initiatives.	Gloucester County has been a leading participant in post-Sandy recovery planning efforts.
Support for FEMA Risk MAP roll-out programs.	Gloucester County OEM has hosted several rounds of meetings and encouraged participation by Municipal OEM Coordinators.
Securing funding for NJ4 HMP update process.	Gloucester County OEM secured the funding for the NJ4 HMP update process and was the contract administrator supervising the activities of the consultant planning team.
Improvements to Delaware River levees.	<p>Gloucester County Office of the County Engineer, Department of Public Works, with the participation and support of the Gloucester County Improvement Authority (GCIA) and funding from multiple sources, has coordinated three related projects to reduce the risk of levee failure along the Delaware River:</p> <ul style="list-style-type: none"> ▪ Sluice Gate Replacement – In 2010, an existing sluice gate located near the boundary between Logan and Greenwich Townships was replaced and approximately 100 feet of the levee in the vicinity of the sluice gate was raised and armored to a minimum elevation of 12 feet above sea level. The project was funded by a grant from the Delaware River Port Authority (DRPA) via the GCIA. The total project cost was \$5 million. ▪ Logan Township Levee Improvements - Immediately prior to hurricane Sandy in 2012, approximately 1,000 feet of the levee in Logan Township south of the sluice gate was raised to a minimum elevation of 12 feet above sea level. Following hurricane Sandy, the raised section of the levee was armored. The total project cost was approximately \$450,000. The cost of the initial work to raise the levee was reimbursed to Gloucester County from FEMA Public Assistance (PA) grant program funds with Gloucester County providing the 20 percent non-federal share of the project cost. The work to armor the levee was funded by a grant from the DRPA via the GCIA. ▪ Greenwich Township Levee Improvements - Following Superstorm Sandy, approximately 3,000 feet of the levee in Greenwich Township north of the sluice gate was raised and armored to a minimum elevation of 12 feet above sea level. The project was funded by a grant from the DRPA via the GCIA. The total project cost was \$3 million and the work was completed in November 2014.
Mill Pond Road (NJ Route 322) Improvements	Immediately prior to hurricane Irene, the Office of the County Engineer coordinated emergency measures to lower pond levels and stabilize the roadway and bridge on NJ Route 322 at Mill Pond in Harrison Township. The roadway also serves as the dam for Mill Pond. After the storm, Gloucester County coordinated stabilization of the roadway as an interim mitigation measure until the NJ Department of Transportation (NJ DOT) was subsequently able to rebuild this whole section of NJ Route 322. The emergency measures were reimbursed through FEMA's PA grant program at a total cost of \$36,000.

Part 4: Mitigation Measures

Mitigation Action, Program, or Project	Comments
Hendrickson Mill Pond Road (County Route 670) Improvements	The roadway that serves as the dam for Hendrickson Mill Pond in Woolwich Township was damaged before hurricane Irene. Prior to the storm, the Office of the County Engineer coordinated actions to drain the pond, demolish the bridge and install emergency stabilization of the roadway to prevent overtopping until the road and bridge could be replaced in a manner that will limit future potential failures. Following hurricane Irene, damage to the roadway was repaired and armored using FEMA PA grant program funds. Replacement of the bridge and additional stabilization work has been completed at a total cost of \$600,000 funded by a FEMA Hazard Mitigation Grant Program (HMGP) grant with the non-federal share assumed by the State of New Jersey.
Jessup Mill Road Improvements	In August 2013, an intense rain storm severely scoured piers and footings of this bridge in Mantua Township. The Gloucester County Office of the County Engineer, using \$910,000 from annual Local Bridges, Future Needs funding provided by NJDOT, coordinated the replacement and armoring of the bridge foundations putting the bridge back in service in April 2015.

It is important to note that several components of the SDVR HMP mitigation measures were not implemented due to circumstances beyond the control of the County OEM Coordinators including:

- Economic impacts of the recession on both municipal and county budgets affected the available resources for what was a labor-intensive program.
- Frequent natural disasters required full attention of available resources for prolonged periods. As described in *Section 3: Hazard Identification and Risk Assessment* of the NJ4 HMP Regional Hazard Mitigation Plan, the region experienced seven presidential disaster declarations since the adoption and approval of the SDVR HMPs including damages from high winds, severe winter weather, and extensive flooding. The administrative aftermath of these disaster declarations carries over for months and can stretch out for years on large events like Superstorm Sandy.

However, essential components of several SDVR HMP mitigation measures were carried over as part of the County Appendix.

In hindsight, the conclusion of the four County OEM Coordinators, all of who were involved in the SDVR HMPs and the NJ4 HMP update, was that the program for the NJ4 HMP needed to be scaled at a more realistic level and focused on coordination activities more consistent with the role and resources of the County OEMs. The Mitigation Measures identified in Part 4.3 are in line with this direction.

Part 4: Mitigation Measures

Part 4.3: County Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the county.

Table GC.1-11 includes the list of mitigation measures that are considered the responsibility of the county. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include essential aspects of projects included in the SDVR HMPs as described in Part 4.2
- Include projects, programs or activities to support the implementation of mitigation measures by the Municipal Working Groups
- Include specific mitigation measures to address known problems or areas of concern for critical facilities and vulnerable populations that are the responsibility of County agencies and departments

Table GC.1-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Table GC.1-11: Gloucester County Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Support municipal outreach and education programs by providing access to current resources and reference materials that Municipal Working Groups can use to inform residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.	All	Goal #1	Both
M-2	Prioritize county critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Support efforts by Municipal Working Groups to survey municipal critical facilities by providing data management services including facilitating periodic updates to inventory and hazard exposure data.	All	Goal #2	Existing
M-4	Support on-going plan maintenance and update processes by County and Municipal Working Groups by providing the most up-to-date information about natural hazards including refinements to flood mapping, evolving data regarding climate change, and related impacts of sea level rise and hazard event frequencies.	All	Goal #2	Existing

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-5	Prioritize recurrent drainage problem areas and initiate data collection with county and, where appropriate, municipal agencies ² to track unreimbursed damages and related response and recovery expenses.	Flood	Goal #2	Existing
M-6	Conduct regular County Working Group meetings consistent with the plan maintenance program and the County Adoption Resolution.	All	Goal #3	Both
M-7	Support regular Municipal Working Group meetings and related implementation efforts including reminders at quarterly Municipal OEM Coordinators' meetings, tracking progress toward implementation of municipal mitigation measures, training regarding implementation issues such as project scoping, identification of current available options for funding, etc.	All	Goal #3	Both
M-8	Facilitate meetings with state, county, and municipal officials to discuss and resolve implementation issues related to multi-jurisdictional mitigation measures. ⁴	All	Goal #4	Both
M-9	Improve Algonkin Lake dam / embankment and road bridge located on County Route 581, also known as Commissioners Pike. The lake straddles the boundary between Gloucester and Salem County and their constituent municipalities, South Harrison Township and Piles Grove Township, respectively. Although ownership of the embankment and bridge is shared with Salem County, Gloucester County has agreed to take responsibility for maintenance and improvements. The cost of this project is estimated at \$5 million by the Office of the County Engineer. Once funding is secured, the improvements are anticipated to take three years to complete. In addition, Gloucester County has applied for a grant in the amount of \$10 million from the Delaware River Valley Basin Commission to acquire this private lake.	Dam Failure	Goal #4	Both

² See *Part 4.5: Multi-Jurisdictional Mitigation Measures*.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-10	<p>Continue Delaware River levee improvements including two additional projects:</p> <ul style="list-style-type: none">▪ Raise the height of the remaining extent of the levee in Gloucester County in Logan and Greenwich Townships and Paulsboro Borough, a total of approximately 15,000 linear feet, to a minimum of 12 feet above sea level and armor the resulting levee expansion. Completion of this project requires potential participation by private property owner(s). The cost of these improvements is estimated at \$50 million. Once funding is secured, the duration of the project is anticipated to be six years.▪ Install stormwater pump station at levee in Greenwich Township to replace need for pump rental and mobilization that currently occurs when large storms are forecast. The cost of these improvements is estimated at \$1 million. Once funding is secured, the duration of the project is anticipated to be 24 months.	Levee Failure	Goal #4	Both

Part 4: Mitigation Measures

Part 4.4: County Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the county mitigation measures.

Table GC.1-12 includes information identified by the County Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria³
- Project Type to help determine funding options and implementation mechanisms at the county level⁴
- Estimated Cost, including estimates provided by the County Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the county level

Table GC.1-12: Gloucester County Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Support municipal outreach and education programs.	Gloucester County OEM	High	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with Municipal Working Groups to identify target audience(s). ▪ Work with County Working Group to identify available resources for producing, maintaining and providing information.
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Gloucester County OEM and Facility Managers	Medium	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Support efforts by Municipal Working Groups to survey municipal critical facilities by providing data management services.	Gloucester County OEM / Gloucester County Planning	Medium	Data Acquisition and Management	Staff time commitment	On-going	Develop and implement procedures and tools for soliciting, collecting, and managing data input from municipalities.
M-4	Support on-going plan maintenance and update processes by County and Municipal Working Groups by providing the most up-to-date information about natural hazards.	Gloucester County OEM / Gloucester County Planning	Medium	Data Acquisition and Management	Staff time commitment	On-going	Work with Municipal Working Groups to identify needs for hazard and risk information for on-going plan implementation and future plan updates.

³ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the County Working Group.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Prioritize recurrent drainage problem areas and initiate data collection with county and, where appropriate, municipal agencies.	Gloucester County OEM and County Working Group	Low	Data Acquisition and Management	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-6	Conduct regular County Working Group meetings.	Gloucester County OEM and County Working Group	Medium	Capabilities and Coordination	Staff time commitment	On-going	Establish regular County Working Group membership, reporting requirements, and meeting / work session schedule.
M-7	Support regular Municipal Working Group meetings and related implementation efforts.	Gloucester County OEM	Medium	Capabilities and Coordination	Staff time commitment	On-going	Identify agenda and briefing materials for quarterly Municipal OEM Coordinator meetings.
M-8	Facilitate meetings with state, county, and municipal officials to discuss and resolve implementation issues related to multi-jurisdictional mitigation measures. ⁴	Gloucester County OEM	High	Varies	Staff time commitment	On-going	Confirm Problem Descriptions and Potential Partners per Table GC.1-13.
M-9	Improve Algonkin Lake dam / embankment and road bridge on County Road 581, also known as Commissioners Pike.	Gloucester County Office of County Engineer	High	Infrastructure Improvement	\$5,000,000	Duration of construction estimated at three years.	Secure funding.
M-10	Continue Delaware River levee improvements.	Gloucester County Office of County Engineer	High	Infrastructure Improvement	\$50,000,000	Duration of construction estimated at six years.	Secure funding.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Groups identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.1-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to:

- Confirm specific responsibilities amongst different level(s) of government to address these problem areas
- Identify mitigation measures or related projects which may address described problem areas acknowledged as County responsibilities including identifying an appropriate County agency or department taking the lead role and monitoring the status of implementing these mitigation measures

Note: It is important to recognize that some of the mitigation measures identified in Table GC.1-13 may not be considered as county responsibilities by county agencies and departments. However, part of the process of reviewing these recommendations from Municipal Working Groups is to identify areas where there are different opinions and arrive at a common understanding of the best way to proceed to resolve these problem areas.

Table GC.1-13: Gloucester County Multi-Jurisdictional Mitigation Measures⁵

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners
Clayton Borough	MJ-1	Improve storm drainage system on Atlantic Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
Clayton Borough	MJ-2	Improve storm drainage on Lewis Drive.	Flood	Goal #4	Both	Municipal OEM, NJDEP
Deptford Township	MJ-1	Risk assessment - Almonesson Lake Dam located on Cooper Street.	Dam Failure	Goal #4	Existing	Municipal OEM, Gloucester County DPW
East Greenwich Township	MJ-1	Alleviate flooding at Berkly Road & West Cohawkin Road.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
East Greenwich Township	MJ-2	Alleviate flooding at West Cohawkin Road and Friendship Road.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW

⁵ Table GC.1-13 is subject to change pending periodic revisions and updates of Municipal Appendices for all participating Municipal Working Groups. In some cases, municipalities did not identify multi-jurisdictional mitigation measures. However, placeholders are included to allow for additions as municipalities implement their respective Appendices.

Part 4: Mitigation Measures

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners
East Greenwich Township	MJ-3	Beaver dams at Union Road bridge.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
East Greenwich Township	MJ-4	Alleviate flooding at Berkely Road and Boat Ramp at Mantua Creek.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
East Greenwich Township	MJ-5	Improve storm drainage at Harmony Road.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
East Greenwich Township	MJ-6	Improve storm drainage on Democrat Road.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
East Greenwich Township	MJ-7	Fatal accidents at Kings Highway (County Route 551) and Tomlin Station Road (County Route 664).		Goal #4	Both	Municipal OEM, Gloucester County DPW
East Greenwich Township	MJ-8	Fatal accidents at Kings Highway and Wolfert Station Road.		Goal #4	Both	Municipal OEM, Gloucester County DPW
Elk Township	MJ-1	Determine current need and options for mitigation at Lake Garrison.	Dam Failure	Goal #4	Existing	Municipal OEM, Lake Garrison Association, Gloucester County DPW, NJDEP
Elk Township	MJ-2	Determine current need and options for mitigation at Lake Gilman.	Dam Failure	Goal #4	Existing	Municipal OEM, Lake Gilman Association, Gloucester County DPW, NJDEP
Elk Township	MJ-3	Risk assessment - Hackney Dam, 431 Richwood Road, County Road / Route 609.	Dam Failure	Goal #4	Existing	Municipal OEM, Harrison Township
Elk Township	MJ-4	Risk assessment - dam on Silver Lake on Route 608.	Dam Failure	Goal #4	Existing	Municipal OEM, Clayton Borough
Elk Township	MJ-5	Risk assessment - Ewan Lake Dam.	Dam Failure	Goal #4	Existing	Municipal OEM, Harrison Township
Franklin Township	MJ-4	Improve storm drainage on Morris Avenue at State Route 40 (evacuation route).	Flood	Goal #4	Existing	Municipal OEM, NJDOT
Franklin Township	MJ-5	Alleviate flooding at West Boulevard & State Route 40.	Flood	Goal #4	Existing	Municipal OEM, NJDOT
Glassboro Borough	MJ-1	Determine status of Oberst Dam for Lake Oberst.	Dam Failure	Goal #4	Both	Municipal OEM, Gloucester County DPW

Part 4: Mitigation Measures

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners
Glassboro Borough	MJ-2	Improve storm drainage at South Academy Street between Grillo Street and Grove Street.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DWP, NJDOT
Glassboro Borough	MJ-3	Determine effectiveness of work-in-progress on detention basin at Rowan Boulevard.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW NJDOT
Glassboro Borough	MJ-4	Alleviate flooding at Chestnut Branch Drive on Rowan University Campus.	Flood	Goal #4	Both	Municipal OEM, Rowan University
Glassboro Borough	MJ-5	Alleviate flooding at Village Grande and Camelot Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
Glassboro Borough	MJ-6	Improve storm drainage at Carpenter Street and Normal Boulevard.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
Glassboro Borough	MJ-7	Improve drainage around Campus Terrace Apartments on Carpenter Street.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
Glassboro Borough	MJ-8	Hazard threat assessment related to South Jersey Gas high pressure lines running along Union Street, Ellis Street, and Delsea Drive.	Hazardous Materials	Goal #4	Both	Municipal OEM and South Jersey Gas
Greenwich Township	MJ-1	Sluice gate cleanup / debris removal at Floodgate Road and Delaware River.	Flood	Goal #4	Existing	Municipal OEM, DuPont Facilities
Harrison Township	MJ-1	Alleviate flooding at Fire Station (Ewan Fire Company) located on 312 Ewan Road, Mullica Hill (CF-5).	Flood	Goal #4	Existing	Municipal OEM, Gloucester County Engineering Department
Logan Township	MJ-1	Alleviate coastal erosion / instability issue at Delaware River/ Repaupo Creek levee (end of Floodgate Road).	Coastal Erosion and Sea Level Rise, Flood	Goal #4	Both	Municipal OEM, Greenwich Township, Gloucester County Engineering Department, NJDEP, FEMA, USACE.

Part 4: Mitigation Measures

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners
Logan Township	MJ-2	Birch Creek Tide Gate	Coastal Erosion and Sea Level Rise, Levee Failure	Goal #4	Both	Municipal OEM, Gloucester County Engineering, NJDEP, FEMA, USACE.
Logan Township	MJ-3	Beaver management program.	Coastal Erosion and Sea Level Rise, Flood	Goal #4	Both	Municipal OEM, NJDEP
Mantua Township	MJ-1	Alleviate flooding at Glassboro Road to include retention system at stream crossing bridge.	Flood	Goal #4	Both	Municipal OEM, Mantua Township DPW, Gloucester County DPW
Mantua Township	MJ-2	Alleviate flooding on Route 45.	Flood	Goal #4	Both	Municipal OEM, NJDOT
Mantua Township	MJ-3	Upgrade storm drainage pipes at Atlantic Avenue and Livingstone Road.	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW
Monroe Township	MJ-1	Alleviate flooding at Black Horse Pike at Squakum Branch.	Flood	Goal #4	Existing	Township OEM, Gloucester County DPW, NJDEP
Monroe Township	MJ-2	Improve storm drainage at Monroe Village storm water management and overflowing retention basin on Prince Avenue.	Flood	Goal #4	Existing	Municipal OEM, NJDOT
Monroe Township	MJ-3	Pitman Downer Road property storm water management.	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW
Monroe Township	MJ-4	Improve storm drainage at North Blackhorse Pike from Berlin Cross Keys to Lake Avenue.	Flood	Goal #4	Existing	Municipal OEM, NJDOT
Monroe Township	MJ-5	Improve storm drainage at US 322 and Walnut.	Flood	Goal #4	Existing	Municipal OEM, NJDOT
National Park Borough	MJ-1	Alleviate flooding at the intersection of County Route 643 (Grove Avenue) and Riverview Avenue.	Flood	Goal #4	Existing	Municipal OEM, West Deptford Township, Gloucester County DPW
National Park Borough	MJ-2	Alleviate flooding at the intersection of County Route 644 (Red Bank Avenue) and County Route 642 (Hessian Avenue).	Flood	Goal #4	Existing	Municipal OEM, West Deptford Township, and Gloucester County DPW

Part 4: Mitigation Measures

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners
National Park Borough	MJ-3	Engineering study to determine appropriate flood mitigation action for flooding on Princeton Avenue (County Route 643).	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW
Newfield Borough	MJ-1	Alleviate flooding at Catawba Avenue and Hazel Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
Newfield Borough	MJ-2	Alleviate flooding at Sandy Drive to address drainage issues between Route 40 and Fawn Drive.	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW
Newfield Borough	MJ-3	Alleviate flooding at Rosemont Avenue and West Boulevard.	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW, NJDOT
Paulsboro Borough	MJ-1					
Pitman Borough	MJ-1	Dredging of storm drains at Alcyon Boulevard and Cedar Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
Pitman Borough	MJ-2	Improve storm drainage at Cedar Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
Pitman Borough	MJ-3	Improve storm drainage at South Broadway & Adams Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
Pitman Borough	MJ-4	Improve storm drainage at East Holly and South Brentwood Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
South Harrison Township	MJ-1	Risk Assessment - Lincoln Lake to South Harrison Township	Dam Failure	Goal #4	Both	Municipal OEM, Gloucester County DPW, Salem County DPW, Upper Pittsgrove TWP DPW
South Harrison Township	MJ-2	Alleviate inadequate culverts on Mullica Hill.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
South Harrison Township	MJ-3	Alleviate flooding at County Route 617 (Mullica Hill Road), and County Route 668 (Harrisonville Road).	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
South Harrison Township	MJ-4	Alleviate flooding at intersection of State Route 45 and County Route 607 (Tomlin-Station Road).	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW

Part 4: Mitigation Measures

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners
South Harrison Township	MJ-5	Wind risk to communications tower (repeater tower).	High Wind	Goal #4	Both	Municipal OEM, Gloucester County DPW
Swedesboro Borough	MJ-1					
Washington Township	MJ-1	Alleviate flooding at Pitman Downer Road and Route 47	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW, NJDOT
Washington Township	MJ-2	Alleviate flooding at Fish Pond Road.	Flood	Goal #4	Both	Municipal OEM, Glassboro Borough DPW, Gloucester County OEM,
Wenonah Borough	MJ-1					
West Deptford Township	MJ-1					
Westville Borough	M-1	Improve drainage at State Route 45 and railroad.	Flood	Goal #4	Both	Municipal OEM, NJDOT
Westville Borough	MJ-2	Improve drainage on Willow Drive between High Street and Broadway (County Route 551).	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW
Westville Borough	MJ-3	Maintain duckbill valves along Broadway (County Route 551).	Flood	Goal #4	Existing	Municipal OEM, NJ DOT
Woodbury City	MJ-1	Storm sewer system at Evergreen Avenue and County Road 650.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW, Conrail
Woodbury City	MJ-2	Improve storm water management system at Conrail railroad and [insert street name(s)].	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW, Conrail
Woodbury City	MJ-3	Alleviate flooding and hardening of Colonial Park Senior Citizen Center.	Flood / High Wind / Severe Weather - Winter	Goal #4	Both	Municipal OEM, Gloucester County DPW
Woodbury Heights Borough	MJ-1	Improve storm drainage system at Glassboro Road (County 553).	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
Woodbury Heights Borough	MJ-2	Sanitary sewer line on Glassboro Road (County 553).	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW
Woolwich Township	MJ-1	Alleviate flooding at High Hill Road.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW

Part 4: Mitigation Measures

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners
Woolwich Township	MJ-2	Floodwalls for High Hill Road and Moravian Road.	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW
Woolwich Township	MJ-3	Alleviate flooding at Woodstown Road at Salem County border.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW, Salem County DPW
Woolwich Township	MJ-4	Alleviate flooding at Kings Highway County Line Bridge.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW, Salem County DPW
Woolwich Township	MJ-5	Critical facilities protection / hazard threat recognition of HazMat (Grasso Foods Inc is the largest pepper packing plant in the country. Services all 50 state & designated a Tier I facility).	Hazardous Materials	Goal #4	Existing	Municipal OEM, Grasso Foods Inc
Rowan University	MJ-1	Alleviate flooding at Triad Hall Apartments (pending recommendations in Rowan University SWM Master Plan).	Flooding	Goal #4	Existing	Rowan University OEM, Glassboro Borough
Rowan University	MJ-2	Alleviate flooding at Recreation Center (pending recommendations in Rowan University SWM Master Plan).	Flooding	Goal #4	Existing	Rowan University OEM, Glassboro Borough
Rowan University	MJ-3	Alleviate flooding at Chestnut Hall Parking Lot (pending recommendations in Rowan University SWM Master Plan).	Flooding	Goal #4	Existing	Rowan University OEM, Glassboro Borough, Gloucester County
Rowan University	MJ-4	Improve conveyance and retention in Chestnut Branch Creek and S-Curve Road (pending recommendations in Rowan University SWM Master Plan).	Flooding	Goal #4	Existing	Rowan University OEM, Glassboro Borough
Rowan University	MJ-5	Identify potential watershed improvements to reduce storm water inflow and/or increase storm water outflow from Rowan University Main Campus	Flooding	Goal #s 2, 3, and 4	Existing	Rowan University OEM, Neighboring Municipalities, Gloucester County, New Jersey

Part 4: Mitigation Measures

Part 4.6: Authorities, Policies, Programs, Resources, and Plan Integration

Part 4.6 includes three (3) subparts:

- **Authorities, Policies, and Programs** - Cross referencing relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding existing authorities, policies, and programs in the region and specific information about the jurisdiction's participation and continued compliance in the National Flood Insurance Program (NFIP)
- **Capabilities and Coordination** - Cross referencing relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level and specific information about the jurisdiction's available resources
- **Plan Review and Integration** – Identifying plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan

Authorities, Policies, and Programs

Section 1.3: *Existing Authorities, Policies, Programs, and Resources* of the NJ4 HMP Regional Hazard Mitigation Plan summarizes relevant authorities, policies, and programs related to hazard mitigation in the region including the NFIP.

Continuing municipal participation in the NFIP as part of the implementation of the NJ4 HMP by the municipalities within Gloucester County, includes:

- Involvement of Floodplain Manager / Administrator during the NJ4 HMP implementation process
- Commitment to adopt updated FIRMs and evaluate / update the municipality's Flood Management Plan and/or Ordinance as appropriate per recommendations in Section 4.6 of the NJ4 HMP Regional Hazard Mitigation Plan

Note: There is no unincorporated land within Gloucester County. Therefore, participation by Gloucester County in the NFIP is not required as all flood insurance eligible properties occur within municipal boundaries.

Gloucester County will support these municipal efforts as part of Mitigation Measures M-1, M-7 and M-8.

Capabilities and Coordination

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. Section 1.3: *Existing Authorities, Policies, Programs, and Resources* of the NJ4 HMP Regional Hazard Mitigation Plan includes summary statements regarding regional resources and the impact of resource limitations on the overall approach to the NJ4 HMP mitigation strategies. Section 4: *Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities and coordination at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation

Gloucester County will continue to support improvements to municipal capabilities as part of Mitigation Measures M-1, M-7 and M-8.

Plan Review and Integration

Specific documents obtained during the plan update process from the County Working Group include:

- Gloucester County Emergency Operations Plan
- Gloucester County Master Plan and related documents

Note: As of April 8, 2016, Gloucester County is in the midst of an update of the Land Use and Transportation Elements of the Gloucester County Master Plan with support from the Delaware Valley Regional Planning Commission. Part of the update process includes incorporating results of the NJ4 HMP Regional Hazard Mitigation Plan and the Municipal and County Appendices for Gloucester County in the recommendations where appropriate.

Table RP.4-4 in *Section 4.6: Plan Review and Integration* of the NJ4 HMP Regional Hazard Mitigation Plan identifies the primary plans and documents collected from each of the participating municipalities. In addition, Annex E.2 provides a complete list of all the plans and documents collected from the participating municipalities.

Section 4.6 also includes the results of reviewing the primary plans and documents to determine the extent to which these documents reflect up-to-date hazard risk and mitigation. In addition, Section 4.6 includes recommendations for integrating the results of the NJ4 HMP, including hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level that are relevant to all participating municipalities and incorporated by reference in each of the jurisdiction-specific Appendices including:

- Hazard Assessments
- Emergency Operations Plans
- Floodplain Management Ordinances
- Master Plans and Reexamination Reports
- Other plans and documents

The plan maintenance process includes a commitment to review and follow these recommendations during future scheduled updates of these various documents as considered appropriate by the Working Group and the governing body of each municipalities.

Gloucester County will continue to support improvements to municipal capabilities as part of Mitigation Measures M-1, M-3, M-4, M-7 and M-8.

Attachment A: Public Review Comments

The following comments were received during the public review of the Gloucester County Appendix:

Table GC.1.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Gloucester County Appendix.

Attachment B: Adoption Resolution

Following this page is the Adoption Resolution for the Gloucester County Municipal Appendix as approved by the Gloucester County Board of Chosen Freeholders.

Attachment C: Approval Letter

Following this page is the Approval Letter for the Gloucester County Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.2
Clayton Borough, New Jersey

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.2-i
Part 1 Overview	GC.2-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.2-1
1.2: Clayton Borough (Gloucester County) Municipal Appendix	GC.2-1
Part 2 Participation	GC.2-2
2.1: Municipal Working Group Participation	GC.2-2
2.2: Public Participation	GC.2-4
Part 3 Hazard Identification and Risk Assessment	GC.2-5
3.1: Municipal Profile	GC.2-5
3.2: Hazard Priorities	GC.2-9
3.3: Hazard Mapping	GC.2-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.2-11
Part 4 Mitigation Measures	GC.2-16
4.1: Mitigation Goals and Strategy	GC.2-16
4.2: SDVR HMP Mitigation Measures	GC.2-17
4.3: Municipal Mitigation Measures – Identification	GC.2-18
4.4: Municipal Mitigation Measures – Implementation	GC.2-20
4.5: Multi-Jurisdictional Mitigation Measures	GC.2-22
4.6: Plan Review and Integration	GC.2-24

Table of Contents

List of Figures

Figure GC.2-1: Clayton Borough (Gloucester County) Location Map	GC.2-5
Figure GC.2-2: Clayton Borough Base Map	GC.2-6
Figure GC.2-3: Clayton Borough Housing Units by Year Built	GC.2-8
Figure GC.2-4: Clayton Borough Mitigation Project Locations	GC.2-23

List of Tables

Table GC.2-1: Clayton Borough (Gloucester County) Working Group	GC.2-2
Table GC.2-2: Public Participation	GC.2-4
Table GC.2-3: Clayton Borough Demographics	GC.2-7
Table GC.2-4: Clayton Borough Demographic Rankings	GC.2-7
Table GC.2-5: Clayton Borough Economics and Housing	GC.2-7
Table GC.2-6: Clayton Borough Ranking (Economics and Housing)	GC.2-8
Table GC.2-7: Supporting Mapping and Exhibits	GC.2-10
Table GC.2-8: Clayton Borough Critical Facilities Inventory	GC.2-12
Table GC.2-9: Clayton Borough Critical Facilities Hazard Exposure	GC.2-14
Table GC.2-10: Status of Clayton Borough SDVR HMP Mitigation Measures	GC.2-17
Table GC.2-11: Clayton Borough Municipal Mitigation Measures Identification	GC.2-19
Table GC.2-12: Clayton Borough Municipal Mitigation Measures Implementation	GC.2-20
Table GC.2-13: Clayton Borough Multi-Jurisdictional Mitigation Measures	GC.2-22

Attachments

Attachment GC.2.A: Public Review Comments	GC.2.A-1
Attachment GC.2.B: Adoption Resolution	GC.2.B-1
Attachment GC.2.C: Approval Letter	GC.2.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Clayton Borough (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Clayton Borough in Gloucester County, New Jersey.

The Clayton Borough Municipal Working Group recommended the Clayton Borough (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Clayton Borough Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.2-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.2-1: Clayton Borough (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Working Group Meeting ²	Round 2 Work Session ³	Working Group Meeting ⁴	Contribution ⁵
Samuel	Teague Jr.	Clayton Borough OEM / Clayton Borough Fire Department	OEM Coordinator / Volunteer Fire Fighter / Floodplain Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Tom	Bianco	Clayton Borough Council	Mayor / Economic Development Committee Member	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Darlene	Vondran	Clayton Borough Council / Public Safety / Clayton Borough Planning Board	Councilperson / Public Safety Director / Plan Use Board Member		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Provided information on Borough Plans.
Sue	Miller	Clayton Borough Administration	Borough Administrator		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized review of Preliminary Draft Appendix.
Edward	Bell	Clayton Borough Administration	Assistant Borough Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			

¹ Round 1 Work Session was held on August 11, 2014.

² Municipal Working Group Work Session was held on October 8, 2014.

³ Round 2 Work Session was held on October 29, 2014.

⁴ Municipal Working Group Work Session was held on December 11, 2014.

⁵ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.2-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Working Group Meeting ²	Round 2 Work Session ³	Working Group Meeting ⁴	Contribution ⁵
Paul	Pheasant	Clayton Borough Public Works	Director				<input checked="" type="checkbox"/>	
Dennis	Marchei	Clayton Borough Police Department	Chief of Police		<input checked="" type="checkbox"/>			

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁶

- Building Code Official
- Engineering
- Community / Faith-Based Organizations
- Non-Governmental Organizations
- Major Employers and Businesses
- Healthcare Institutions
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Emergency Medical Services
- Business Associations
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources

⁶ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.2-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.2-2: Public Participation

Date	Type of Involvement	Location
November 17, 2014	Link to Project Website (http://nj4hmp.com) established	Borough of Clayton ⁷
December 4, 2014	Flyers posted	Clayton Borough Hall and Community Board at Fulton Bank
December 4, 2014	Preliminary Municipal Appendix posted to website for public comment	Borough of Clayton ⁷
December 5, 2014	Citizen Survey posted	Borough of Clayton ⁷
December 11, 2014	Public hearing included on Clayton Borough Council agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	125 North Delsea Drive, Clayton
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁸ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁹

⁷ www.claytonnj.com

⁸ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁹ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

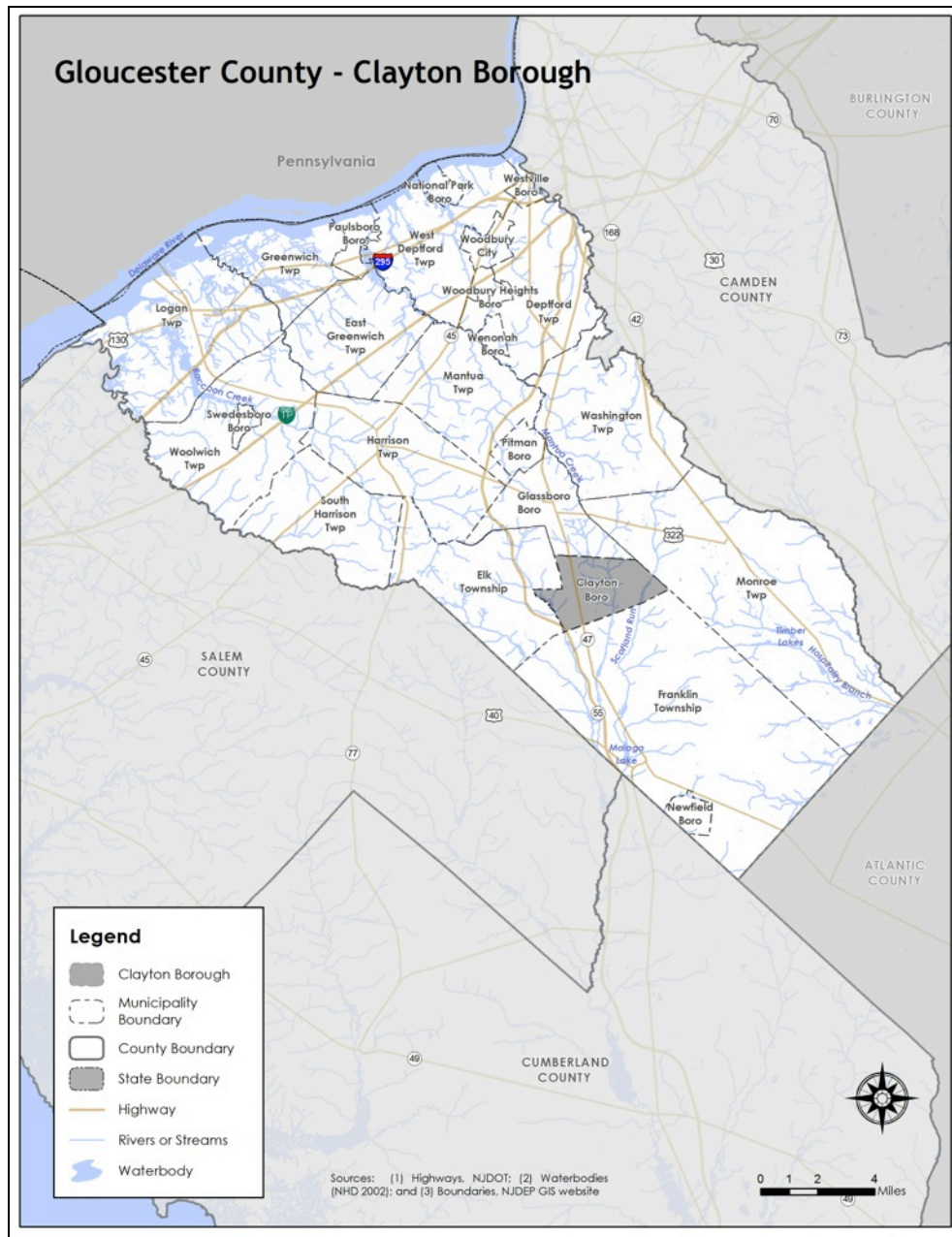
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Clayton Borough is located in the central part of Gloucester County (See Figure GC.2-1).

Figure GC.2-1: Clayton Borough (Gloucester County) Location Map

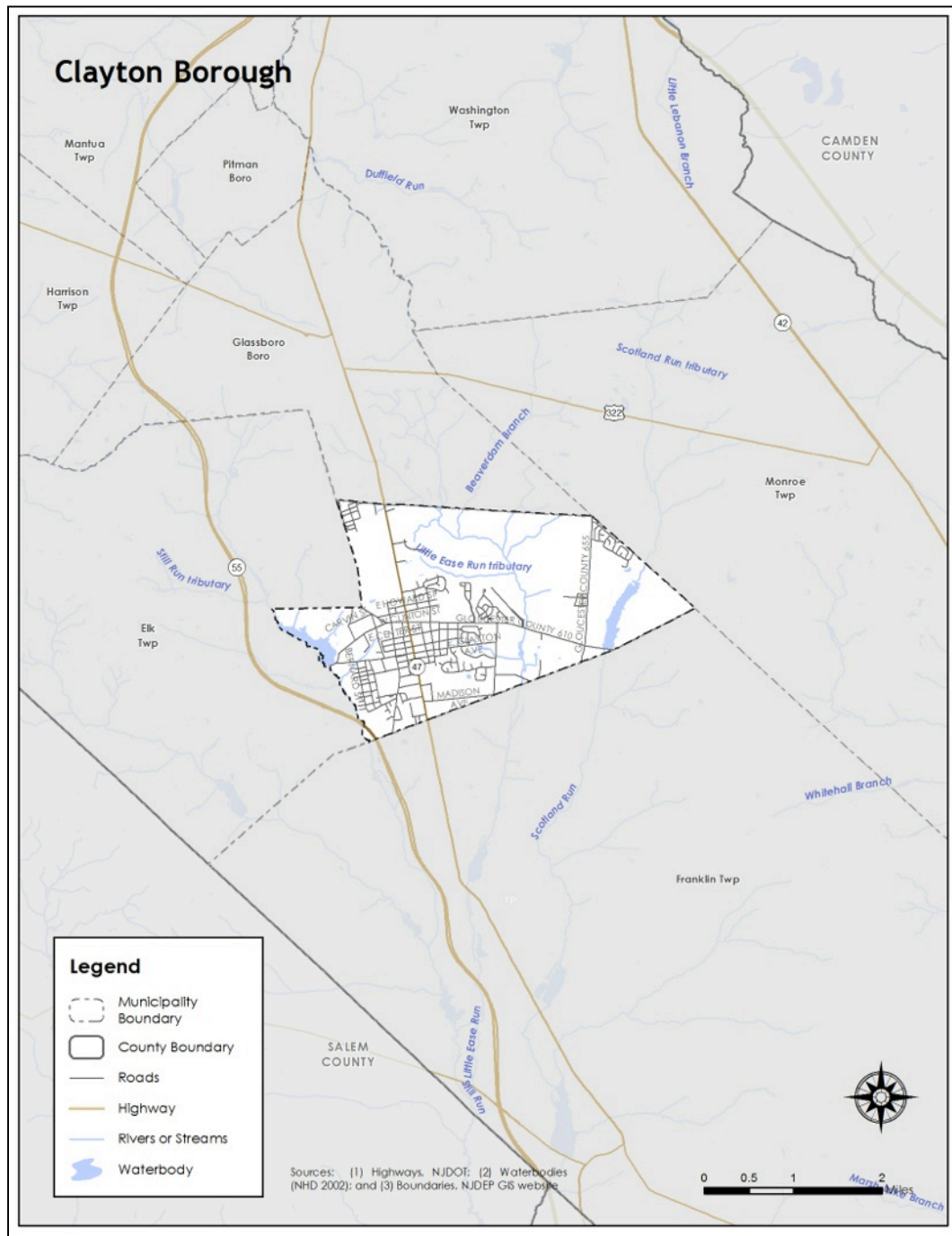


Part 3: Hazard Identification and Risk Assessment

Clayton Borough is a growing community with a history dating back to shortly before the Revolutionary War. With a population of close to 8,000 people, Clayton Borough continues to develop commercial and retail areas.

Per Figure GC.2-2, the major water courses include Little Ease Run tributary, Silver Lake, and Beaverdam Branch. Major transportation routes include State Highways 47 and 55, Academy Street, and Clayton Avenue. The land is gently rolling.

Figure GC.2-2: Clayton Borough Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.2-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.2-3: Clayton Borough Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Clayton Borough	Gloucester County	Region	New Jersey
2000 Population	7,139	254,673	974,328	8,414,350
2010 Population	8,179	288,288	1,024,926	8,791,894
Percent Change	14.57%	13.2%	5.19%	4.49%
Population Density	1,145.5 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	7.14 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	26.3	24.4	24.1	23.5
% of Population 18 - 64	63.5	63.2	62.7	63
% of Population 65 and over	10.2	12.4	13.2	13.5

Table GC.2-4 illustrates how Clayton Borough ranks in the county, the four county region, and New Jersey.

Table GC.2-4: Clayton Borough Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	13	34	281
Land Area Rank	15	45	229
Population Density Rank	13	49	362
Population Change Rank	8	14	-

Table GC.2-5 includes information related to economic and housing statistics for Clayton Borough, Gloucester County, the four county region, and New Jersey.

Table GC.2-5: Clayton Borough Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Clayton Borough	Gloucester County	Region	New Jersey
Date Incorporated	May 9, 1887	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$70,299	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	3,128	109,796	397,990	3,529,033
Occupied Housing Units	2,916	104,271	372,472	3,176,069
Vacant Housing Units	212	5,525	25,518	352,964
Owner Occupied Housing Units	2,284	83,525	266,593	2,126,279
Renter Occupied Housing Units	632	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Clayton Borough	Gloucester County	Region	New Jersey
Building Permits	21	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

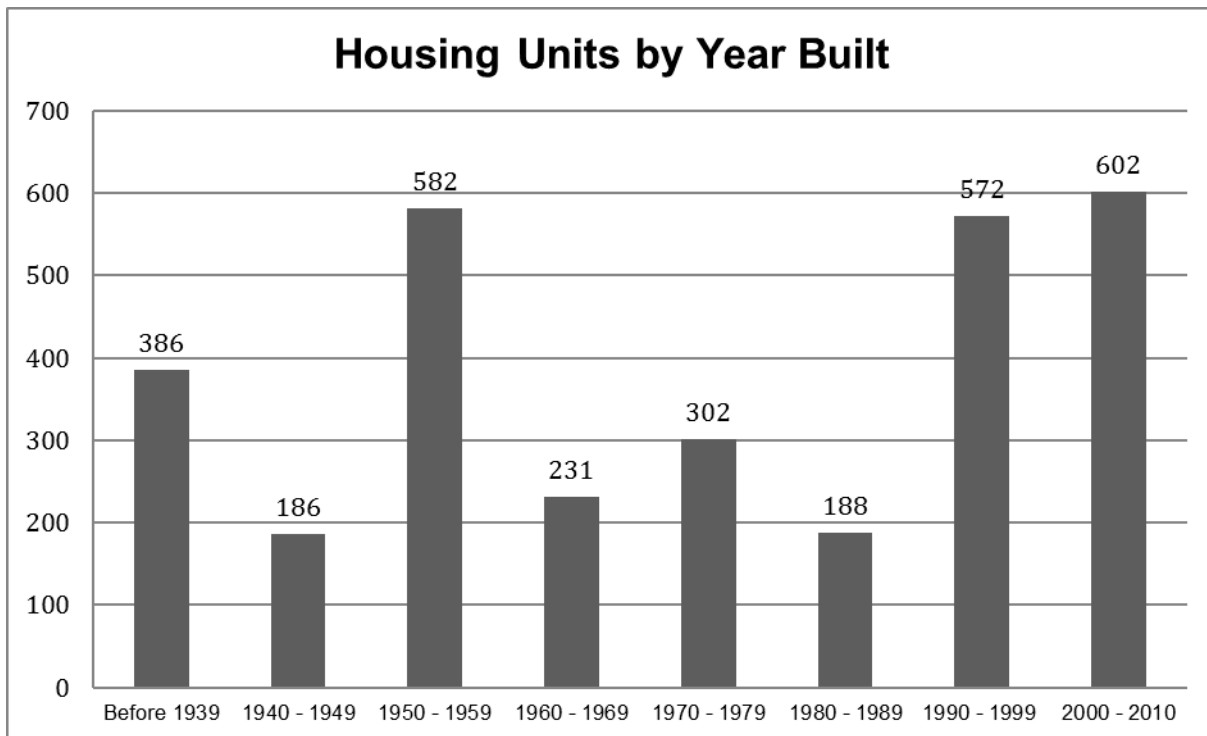
Table GC.2-6 illustrates how Clayton Borough ranks in the county and the four county region.

Table GC.2-6: Clayton Borough Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	11	27
Vacant Housing Rank	11	32
Renter Occupied Housing Rank	9	36
Building Permits	8	19

Figure GC.2-3 illustrates development patterns in Clayton Borough by examining housing units by year built. Nearly 19% of homes in Clayton Borough were built during the 1950s.

Figure GC.2-3: Clayton Borough Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Flood

Moderate Priority

- Dam Failure
- Drought
- Extreme Temperature: Cold & Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter
- Wildfire

Low Priority

- Earthquake

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Levee Failure

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.2-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.2-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.2-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.2-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.2-8: Clayton Borough (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Borough Hall	Municipal	Administrative Offices			N	Y		
CF-2	Emergency Operations Center	EOC	Co-located Facilities		CF-1	N	Y		
CF-3	Police Station	Law Enforcement Facilities	Stations		CF-1	N	Y	Includes a holding cell	
CF-4	Clayton Borough Fire Company	Fire Stations	Stations			Y	Y	Shelter of last resort	
CF-5	Public Work Facilities	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station			N	N		M-5
CF-6	Water Treatment Plant	Utilities – Water	Treatment Plants			N/A	Y		
CF-7	Water Tower	Utilities – Water	Water Towers			N/A	Y		
CF-8	Water Tower	Utilities – Water	Water Towers			N/A	Y		
CF-9	Water Tower	Utilities – Water	Water Towers			N/A	Y		
CF-10	Treatment Plant	Utilities – Wastewater	Treatment Plants			N/A			
CF-11	Brown Lane Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A			M-10
CF-12	East Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A	Y		
CF-13	Cenco Boulevard Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A			
CF-14	Center Street Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A			
CF-15	Lawns Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A			
CF-16	Boro Avenue	Utilities – Wastewater	Pump Stations / Lift Stations			N/A			
CF-17	Chestnut Street Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A			
CF-18	Booster Station Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A			

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-19	Borough Hall Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A			
CF-20	Public Works Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A			
CF-21	Recreation Center Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A			
CF-22	Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A	Y		
CF-23	Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A	Y		
CF-24	Herma S. Simmons Elementary School	Schools	Public Schools			Y	Y		
CF-25	Clayton High School & Clayton Middles School	Schools	Public Schools			Y	Y		
CF-26	St Catherine Of Siena School	Schools	Private Schools			N	Y		
CF-27	Senior Center	Vulnerable Populations Facilities	Senior Center			Y	N	Still under construction.	M-6
CF-28	Recreation Center	Other Municipal	Recreation Center			Y	N		M-7

Part 3: Hazard Identification and Risk Assessment

Table GC.2-9: Clayton Borough (Gloucester County) Critical Facilities Hazard Exposure²

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Borough Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-3	Police Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-4	Clayton Borough Fire Company	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-5	Public Work Facilities	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-6	Water Treatment Plant	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-7	Water Tower	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-8	Water Tower	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-9	Water Tower	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-10	Treatment Plant	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-11	Brown Lane Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-12	East Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-13	Cenco Boulevard Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-14	Center Street Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-15	Lawns Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-16	Boro Avenue	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-17	Chestnut Street Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-18	Booster Station Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

² **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-19	Borough Hall Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-20	Public Works Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-21	Recreation Center Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-22	Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-23	Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-24	Herma S. Simmons Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-25	Clayton High School & Clayton Middles School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-26	St Catherine Of Siena School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-27	Senior Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-28	Recreation Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as initial risk reduction effort
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures, to include private dam monitoring and maintenance measures
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.2-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.2-10.

Table GC.2-10: Status of Clayton Borough (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Clayton 1: Structural retrofit of homes located between North Street and Main Street.	Not completed, not funded.	Issue is not considered valid. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Clayton 2: Engineering study to assess risk from Silver Lake Dam located on West Clayton Avenue.	Completed.	Issue was resolved through private funding mechanism. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Clayton 3: Engineering study to determine appropriate flood mitigation action and envelope/ improved path structural retrofits of data storage (Clayton Community Recreation Center) on Washington Avenue.	Completed.	Issue was resolved by moving records to upper floor in Clayton Borough Recreation Center. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Clayton 4: Engineering study to determine appropriate flood mitigation action and envelope/ improved path/ structural retrofits and secure roof ballast of Emergency Operation Center (EOC) and Police (Municipal Building) on Route 47.	Not completed, not funded.	Issue is not considered valid. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Clayton 5: Structural retrofit of Rustic Village Apartments - located on Route 47, (Buildings units A-K).	Not completed, not funded.	Issue is not considered valid. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Clayton 6: Secure roof ballast of shelter (Herma Simmons Elementary School) located on 300 West Chestnut Avenue.	Completed.	School Board procured a bond to complete this work. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Clayton 7: Critical facilities protection/ hazard threat recognition of hazmat (Propane Tank Farm) located on Delphi Drive Route 47.	Not completed, not funded.	Revised mitigation measure included in updated NJ4 HMP and Municipal Appendix. ¹	M-16

¹ Although natural hazards are the focus of the NJ4 HMP, these technological hazards are a continuing concern to the community and are documented in the Municipal Appendix to reflect the full range of hazards within Clayton Borough.

Part 4: Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Clayton 8: Critical facilities protection/ hazard threat recognition of hazmat (Aleris Light Aluminum Company).	Not completed, not funded.	Revised mitigation measure included in updated NJ4 HMP and Municipal Appendix. ¹	M-17

Table GC.2-10 Notes:

- A. See Tables GC.2-11 and GC.2-12 for municipal (M-#) mitigation measures
B. See Table GC.2-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality

Table GC.2-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)² if applicable

Note: Clayton Borough does not currently have RL or SRL properties per information provided by the New Jersey Department of Environmental Protection.

Table GC.2-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.2-4.

² See Section 3: Hazard Identification and Risk Assessment and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

Part 4: Mitigation Measures

Table GC.2-11: Clayton Borough (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none"> • Current hazards and risks • Changing conditions and actions that may reduce / increase risk to include monitoring and maintenance of privately owned dams • Best practices for hazard mitigation at the individual or property level. 	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #3	Both
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #4	Both
M-5	Install permanent backup emergency power generator at Public Works Building (CF-5).	All	Goal #4	Existing
M-6	Install permanent backup emergency power generator at Senior Center (CF-27).	All	Goal #4	Both
M-7	Install permanent backup emergency power generator at Recreation Center (CF-28).	All	Goal #4	Both
M-8	Clean storm drains behind Brown Lane.	Flood	Goal #4	Existing
M-9	Upgrade drainage system at North Street.	Flood	Goal #4	Existing
M-10	Upgrade drainage system at Pump Station located at Brown Lane (CF-11).	Flood	Goal #4	Existing
M-11	Dredge Still Run stream behind Bernard Street. ³	Flood	Goal #4	Existing
M-12	Dredge area of Little Ease Run Creek behind North Dennis Drive. ³	Flood	Goal #4	Existing
M-13	Engineering study to determine sewer flooding and infiltration at Bernard Street & Washington Avenue.	Flood	Goal #4	Existing
M-14	Engineering study to identify upgrades to storm water management system at Lawns Area.	Flood	Goal #4	Existing
M-15	Engineering study to determine drainage / water storage solution at Still Run.	Flood	Goal #4	Existing
M-16	Hazard threat assessment related to Propane Tank Farm located on Delphi Drive Route 47. ^{4,5}	Risk / Threat Assessment	Goal #4	Existing
M-17	Hazard threat assessment related to Aleris Light Aluminum Company. ^{4,6}	Risk / Threat Assessment	Goal #4	Existing

³ Dredging can only be a consideration for mitigation if Clayton Borough receives permits from NJDEP.

⁴ **Note to Draft NJ4 HMP Reviewers:** Although natural hazards are the focus of the NJ4 HMP, these technological hazards are a continuing concern to the community and are documented in the Municipal Appendix to reflect the full range of hazards within Clayton Borough.

⁵ Work with Propane Tank Farm to complete mitigation measure.

⁶ Work with Aleris Light Aluminum Company to complete mitigation measure.

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures

Table GC.2-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria⁷
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁸
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.2-12: Clayton Borough (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Moderate	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	High	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Public Works	High	Data Acquisition and Management	Staff time commitment	On-going	Establish priorities, procedures, and reporting process for data collection.
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.

⁷ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁸ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Install permanent backup emergency power generator at Public Works Building (CF-5).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Install permanent backup emergency power generator at Senior Center (CF-27).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-7	Install permanent backup emergency power generator at Recreation Center (CF-28).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-8	Clean storm drains behind Brown Lane.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	\$100K – \$500K	One to three years	Conduct project scoping.
M-9	Upgrade drainage system at North Street.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	\$100K – \$500K	One to three years	Conduct project scoping.
M-10	Upgrade drainage system at Pump Station located at Brown Lane (CF-11).	Municipal OEM and Public Works Department	High	Public Property Flood Mitigation	< \$100K	One to three years	Conduct project scoping.
M-11	Dredge Still Run stream behind Bernard Street.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	< \$100K	One to three years	Conduct project scoping.
M-12	Dredge area of Little Ease Run Creek behind North Dennis Drive.	Municipal OEM and Public Works Department	Moderate	Private Property Flood Mitigation	\$100K – \$1M	Three to five years	Conduct project scoping.
M-13	Engineering study to determine sewer flooding and infiltration at Bernard Street & Washington Avenue.	Municipal OEM and Public Works Department	High	Public Property Flood Mitigation	< \$50K	One to three years	Develop scope of work for engineering study and procure professional consulting services.
M-14	Engineering study to identify upgrades to storm water management system at Lawns Area.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	< \$50K	One to three years	Develop scope of work for engineering study and procure professional consulting services.
M-15	Engineering study to determine drainage / water storage solution at Still Run.	Municipal OEM, Public Works Department, Private Home Owners	High	Private Property Flood Mitigation	< \$50K	One to three years	Develop scope of work for engineering study and procure professional consulting services.
M-16	Hazard threat assessment related to Propane Tank Farm located on Delphi Drive Route 47.	Municipal OEM and Propane Tank Farm	Low	Risk / Threat Assessment	< \$50K	Three to five years	Develop scope of work for risk / threat assessment and procure professional consulting services.
M-17	Hazard threat assessment related to Aleris Light Aluminum Company.	Municipal OEM and Aleris Light Aluminum Company	Low	Risk / Threat Assessment	< \$50K	Three to five years	Develop scope of work for risk / threat assessment and procure professional consulting services.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.2-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

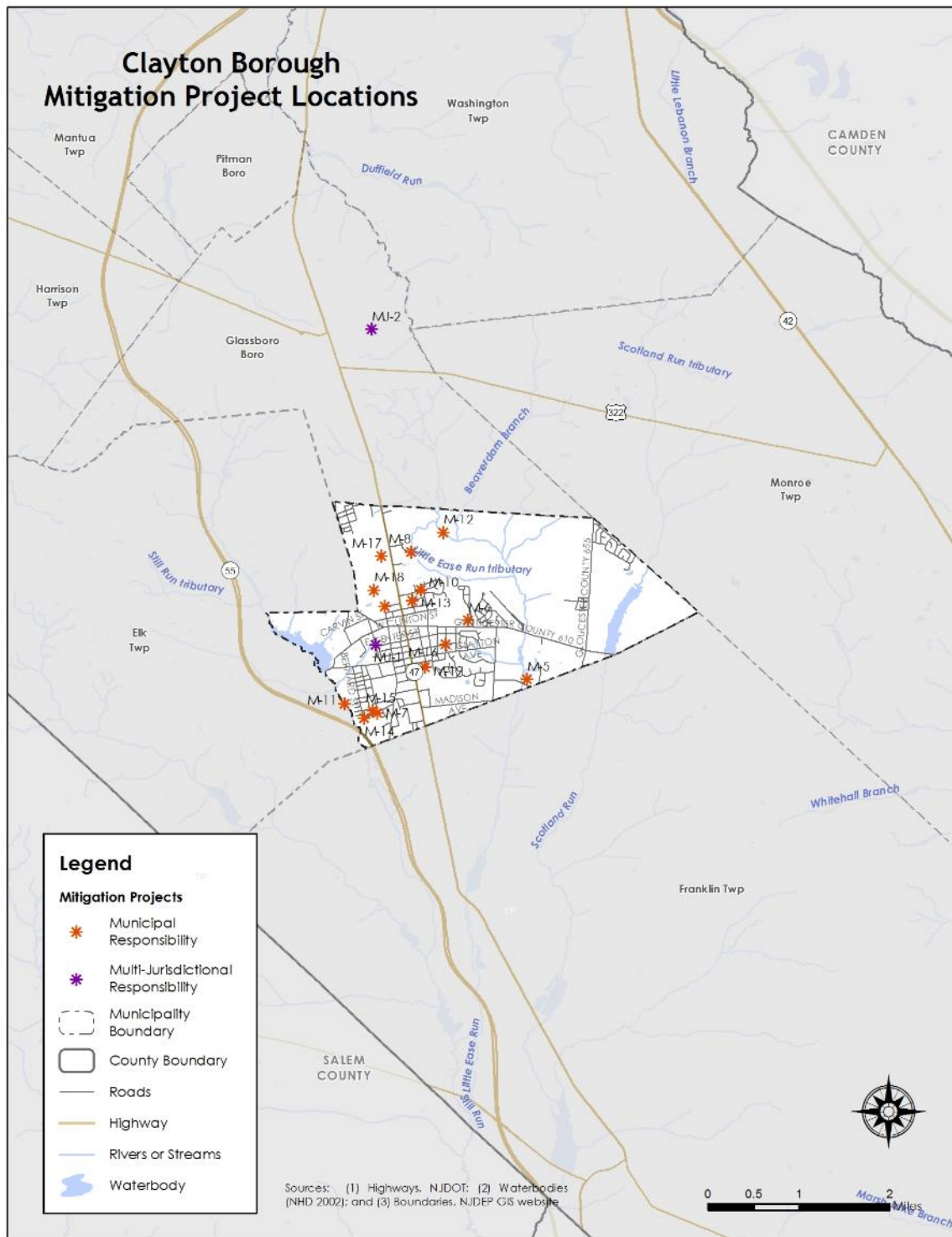
Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.2-4.

Table GC.2-13: Clayton Borough (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Improve storm drainage system on Atlantic Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-2	Improve storm drainage on Lewis Drive.	Flood	Goal #4	Both	Municipal OEM, NJDEP	High

Part 4: Mitigation Measures

Figure GC.2-4: Clayton Borough Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan (2013)
- Floodplain Ordinance
- Master Plan and Reexamination Reports (2007)
- Capital Improvement Budget (2014)⁹
- Land Use and Development Ordinances¹⁰
- Stormwater Management Plan¹¹

⁹ <http://108.174.148.114/~clayton4/public/wp-content/uploads/2014/04/Clayton2014BudgetadoptedApril242014.pdf>

¹⁰ <http://claytonnj.com/public/borough-ordinances/>

¹¹ http://108.174.148.114/~clayton4/public/wp-content/uploads/Boro_Ordinances/Storm_Sewer_System.pdf

Attachment A: Public Review Comments

The following comments were received during the public review of the Clayton Borough Municipal Appendix:

Table GC.2.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Clayton Borough Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.3
Deptford Township, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.3-i
Part 1 Overview	GC.3-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.3-1
1.2: Deptford Township (Gloucester County) Municipal Appendix	GC.3-1
Part 2 Participation	GC.3-2
2.1: Municipal Working Group Participation	GC.3-2
2.2: Public Participation	GC.3-4
Part 3 Hazard Identification and Risk Assessment	GC.3-5
3.1: Municipal Profile	GC.3-5
3.2: Hazard Priorities	GC.3-9
3.3: Hazard Mapping	GC.3-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.3-11
Part 4 Mitigation Measures	GC.3-17
4.1: Mitigation Goals and Strategy	GC.3-17
4.2: SDVR HMP Mitigation Measures	GC.3-18
4.3: Municipal Mitigation Measures – Identification	GC.3-19
4.4: Municipal Mitigation Measures – Implementation	GC.3-21
4.5: Multi-Jurisdictional Mitigation Measures	GC.3-23
4.6: Plan Review and Integration	GC.3-25

Table of Contents

List of Figures

Figure GC.3-1: Deptford Township (Gloucester County) Location Map	GC.3-5
Figure GC.3-2: Deptford Township Base Map	GC.3-6
Figure GC.3-3: Deptford Township Housing Units by Year Built	GC.3-8
Figure GC.3-4: Deptford Township Mitigation Project Locations	GC.3-24

List of Tables

Table GC.3-1: Deptford Township (Gloucester County) Working Group	GC.3-2
Table GC.3-2: Public Participation	GC.3-4
Table GC.3-3: Deptford Township Demographics	GC.3-7
Table GC.3-4: Deptford Township Demographic Rankings	GC.3-7
Table GC.3-5: Deptford Township Economics and Housing	GC.3-7
Table GC.3-6: Deptford Township Ranking (Economics and Housing)	GC.3-8
Table GC.3-7: Supporting Mapping and Exhibits	GC.3-10
Table GC.3-8: Deptford Township Critical Facilities Inventory	GC.3-12
Table GC.3-9: Deptford Township Critical Facilities Hazard Exposure	GC.3-15
Table GC.3-10: Status of Deptford Township SDVR HMP Mitigation Measures	GC.3-18
Table GC.3-11: Deptford Township Municipal Mitigation Measures Identification	GC.3-19
Table GC.3-12: Deptford Township Municipal Mitigation Measures Implementation	GC.3-21
Table GC.3-13: Deptford Township Multi-Jurisdictional Mitigation Measures	GC.3-23

Attachments

Attachment GC.3.A: Public Review Comments	GC.3.A-1
Attachment GC.3.B: Adoption Resolution	GC.3.B-1
Attachment GC.3.C: Approval Letter	GC.3.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Deptford Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Deptford Township in Gloucester County, New Jersey.

The Deptford Township Municipal Working Group recommended the Deptford Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Deptford Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.3-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.3-1: Deptford Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Donald	Banks	Deptford Township OEM / Deptford Township Planning Board	Emergency Management Coordinator / Planning Board Committee Member	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Tom	Newman	Deptford Township OEM	Deputy Emergency Management Coordinator		<input checked="" type="checkbox"/>	
Christian	Romano	Deptford Township Construction Office	Construction Official / Floodplain Administrator		<input checked="" type="checkbox"/>	
Michael	Storms	Deptford Township Public Works	Director Public Works	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Edward	Deak	Deptford Township MUA	Superintendent	<input checked="" type="checkbox"/>		
William	Hanstein	Deptford Township Police Department	Police Chief		<input checked="" type="checkbox"/>	
Michael	Divito Jr.	Deptford Township Police Department	Police Officer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on June 23, 2014.

² Round 2 Work Session was held on September 23, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.3-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Charles	Jones	Deptford Township EMS	EMS Liaison	<input checked="" type="checkbox"/>		
Rick	Margolese	Deptford Township Schools	Assistant Supervisor Buildings and Grounds	<input checked="" type="checkbox"/>		

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Elected Officials
- GIS / IT Specialist
- Fire
- Business Associations
- Community / Faith-Based Organizations
- Major Employers and Businesses
- Healthcare Institutions

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- Critical Infrastructure and Key Resources
- Environmental Organizations
- Non-Governmental Organizations

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.3-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.3-2: Public Participation

Date	Type of Involvement	Location
September 14, 2014	Link to Project Website (http://nj4hmp.com) established	Deptford Township, Gloucester County N.J. ⁵
September 18, 2014	Flyers posted	Recreation Center
September 18, 2014	Public outreach	Community Emergency Preparedness Events
December 3, 2014	Preliminary Municipal Appendix posted to website for public comment	Deptford Township, Gloucester County N.J. ⁵
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁶ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁷

⁵ <http://www.deptford-nj.org/>

⁶ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

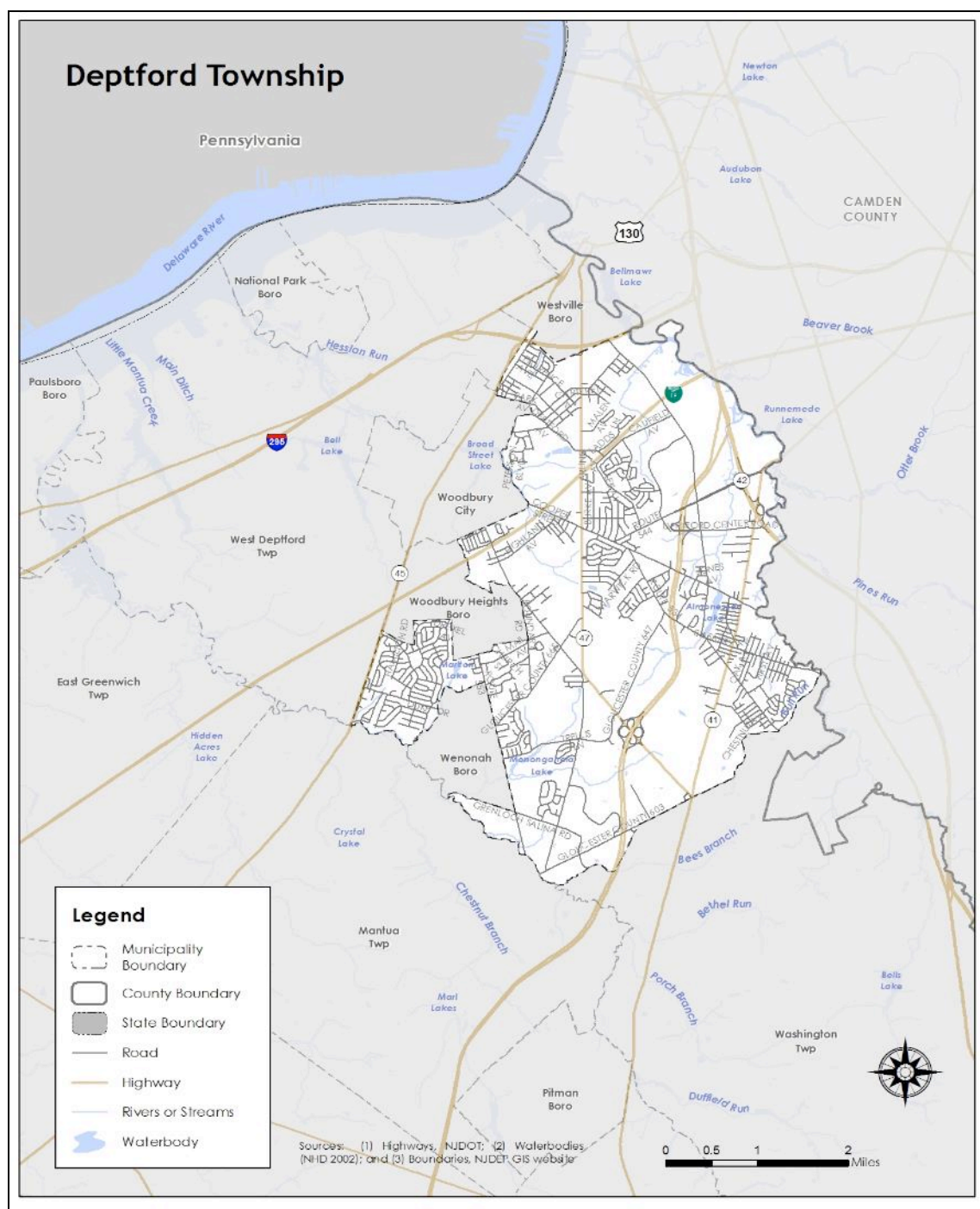
⁷ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Deptford Township is located in northern Gloucester County. As a historic town dating back to 1695, Deptford Township has become a thriving urban area. It is the country's third most populated municipality. Almonesson and Oak Valley are unincorporated communities in the municipality.

Per Figure GC.3-2, the major water bodies include Almonesson Lake and Monongahela Lake. Major transportation routes include the New Jersey Turnpike and State Highway 42. The land is predominantly flat.

Figure GC.3-2: Deptford Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.3-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.3-3: Deptford Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Deptford Township	Gloucester County	Region	New Jersey
2000 Population	26,763	254,673	974,328	8,414,350
2010 Population	30,561	288,288	1,024,926	8,791,894
Percent Change	14.19%	13.2%	5.19%	4.49%
Population Density	1,760.3 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	17.33 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	21.6	24.4	24.1	23.5
% of Population 18 - 64	63.4	63.2	62.7	63
% of Population 65 and over	15.0	12.4	13.2	13.5

Table GC.3-4 illustrates how Deptford Township ranks in the county, the four county region, and New Jersey.

Table GC.3-4: Deptford Township Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	3	9	72
Land Area Rank	8	32	156
Population Density Rank	11	45	306
Population Change Rank	9	15	-

Table GC.3-5 includes information related to economic and housing statistics for Deptford Township, Gloucester County, the four county region, and New Jersey.

Table GC.3-5: Deptford Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Deptford Township	Gloucester County	Region	New Jersey
Date Incorporated	February 21, 1798	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$66,833	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	12,361	109,796	397,990	3,529,033
Occupied Housing Units	11,689	104,271	372,472	3,176,069
Vacant Housing Units	672	5,525	25,518	352,964
Owner Occupied Housing Units	8,939	83,525	266,593	2,126,279
Renter occupied Housing Units	2,750	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Deptford Township	Gloucester County	Region	New Jersey
Building Permits	51	716	1,554	13,535
Largest Industry	Educational Services, Health Care and Social Assistance, Retail Trade	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

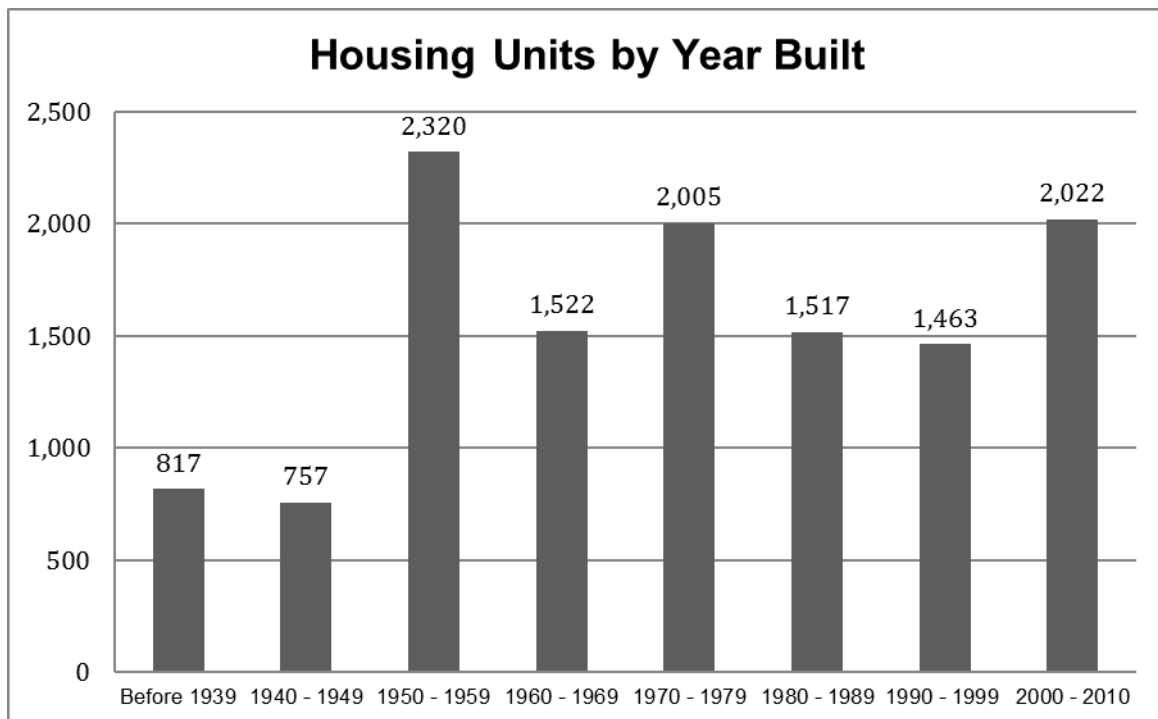
Table GC.3-6 illustrates how Deptford Township ranks in the county and the four county region.

Table GC.3-6: Deptford Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	14	34
Vacant Housing Rank	1	10
Renter Occupied Housing Rank	2	12
Building Permits Rank	6	10

Figure GC.3-3 illustrates development patterns in Deptford Township by examining housing units by year built. About 18% of homes in Deptford Township were built during the 1950s.

Figure GC.3-3: Deptford Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Flood
- Severe Weather – Summer
- Severe Weather – Winter

Moderate Priority

- Dam Failure
- Extreme Temperature: Cold & Hot
- High Wind

Low Priority

- Drought
- Earthquake
- Wildfire

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Levee Failure

¹ See *Section 3: Hazard Identification and Risk Assessment*.

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.3-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.3-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge)	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where increased inundation due to sea level rise may occur
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.3-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.3-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.3-8: Deptford Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Township Hall	Municipal	Administrative Offices	1011 Cooper Street, Woodbury		Y	Y ²		
CF-2	Emergency Operations Center	EOC	Co-located Facilities	1011 Cooper Street, Woodbury	CF-1	Y	Y ²		
CF-3	Deptford Township Police Station	Law Enforcement Facilities	Stations	1011 Cooper Street, Woodbury	CF-1	Y	Y ²		M-10
CF-4	Battalion 9-1: Princeton Boulevard Station	FireStation	Stations	595 Princeton Boulevard, Wenonah		Y	Y		
CF-5	Battalion 9-2: Fisher Street Station	FireStations	Stations	86 Fisher Avenue, Woodbury		Y	Y		
CF-6	Battalion 9-2: Tacoma Boulevard Station	FireStation	Stations	768 Tacoma Boulevard, Westville		Y	N		M-6
CF-7	Battalion 9-3: Cooper Street Stations	FireStation	Stations	2401 Good Intent Road, Deptford		Y	Y		
CF-8	Battalion 9-3: Cooper Street Station	FireStation	Stations	1700 South Almonesson Road, Deptford		Y	N		M-7
CF-9	Battalion 9-4: Tanyard Road Station	FireStation	Stations	630 Tanyard Road, Deptford		Y	N		M-8
CF-10	Battalion 9-4: Delsea Drive Station	FireStation	Stations	1830 South Delsea Drive, Deptford		Y	Y		
CF-11	Deptford Township Public Works Facilities	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	1702 Hurffville Road, Deptford		N	N		M-5 / M-14

² Township Hall, EOC Facility, and Police Station Facility utilize two separate generators. Capacity of Police Station Facility generator to be determined through mitigation project M-10.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-12	Archbishop Damiano School	Schools	Private Schools	1145 Delsea Drive, Westville Grove		Y	N ³		
CF-13	Holy Trinity	Schools	Private Schools	1215 Delsea Drive, Westville		Y	N ³		
CF-14	Delaware Valley Junior Academy - Private	Schools	Private Schools	240 Sickie Lane, Deptford		Y	N ³		
CF-15	Delaware Valley Junior Academy - Private	Schools	Private Schools	240 Sickie Lane, Deptford		Y	N ³		
CF-16	Shady Lane Elementary School	Schools	Public Schools	1360 Tanyard Road, Sewell		Y	N ³		
CF-17	Central Early Childhood Center	Schools	Public Schools	1447 Delsea Drive, Deptford		Y	Y		
CF-18	Good Intent Elementary School	Schools	Public Schools	1555 Good Intent Road, Deptford		Y	N ³		
CF-19	New Sharon School	Schools	Public Schools	1810 Delsea Drive, Deptford		N	N		
CF-20	Oak Valley Elementary School	Schools	Public Schools	525 College Boulevard, Wenonah		Y	N ³		
CF-21	Lake Tract Elementary School	Schools	Public Schools	690 Iszard Road, Deptford		Y	N ³		M-15
CF-22	Pine Acres Elementary School	Schools	Public Schools	720 Purdue Avenue, Wenonah		Y	N ³		
CF-23	Monogahela Middle School	Schools	Public Schools	890 Bankbridge Road, Sewell		Y	N ³		M-9 / M-17
CF-24	Deptford Township High School	Schools	Public Schools	575 South Fox Run Road, Deptford		Y	Y ⁴		M-16
CF-25	Gloucester Manor Health Care	Vulnerable Populations Facilities	Private Assisted Living	685 Salina Road, Sewell		N ⁵	Y		
CF-26	Deptford Center for Rehabilitation and Healthcare	Vulnerable Populations Facilities	Private Assisted Living	1511 Clements Bridge Road, Deptford		N ⁵	N		

³ These critical facilities have been designated as shelters for Deptford Township, but do not currently have backup emergency power capability.

⁴ Back-up generator provides partial building coverage for emergency lighting.

⁵ Shelter-in-place.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-27	Brookdale Deptford Assisted Living	Vulnerable Populations Facilities	Private Assisted Living	1674 Delsea Drive, Deptford		N ⁶	N		
CF-28	Twin Cedar's Assisted Living	Vulnerable Populations Facilities	Private Assisted Living	1456 Glassboro Road, Wenonah		N ⁶	N		
CF-29	Brightview Woodbury Lake Assisted Living	Vulnerable Populations Facilities	Private Assisted Living	752 Cooper Street, Woodbury		N ⁶	N		

⁶ Vulnerable populations in facilities where there is no shelter in place and which do not have backup power generators will be moved to available shelters with backup power generators during evacuation related emergencies.

Part 3: Hazard Identification and Risk Assessment

Table GC.3-9: Deptford Township (Gloucester County) Critical Facilities Hazard Exposure⁷

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Township Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-3	Deptford Township Police Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-4	Battalion 9-1: Princeton Boulevard Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-5	Battalion 9-2: Fisher Street Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-6	Battalion 9-2: Tacoma Boulevard Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-7	Battalion 9-3: Cooper Street Stations	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-8	Battalion 9-3: Cooper Street Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-9	Battalion 9-4: Tanyard Road Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-10	Battalion 9-4: Delsea Drive Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-11	Deptford Township Public Works Facilities	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-12	Archbishop Damiano School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A

⁷ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix submittal to NJOEM and FEMA. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-13	Holy Trinity	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-14	Delaware Valley Junior Academy - Private	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-15	Delaware Valley Junior Academy - Private	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-16	Shady Lane Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-17	Central Early Childhood Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-18	Good Intent Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-19	New Sharon School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-20	Oak Valley Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-21	Lake Tract Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-22	Pine Acres Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-23	Monogahela Middle School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-24	Deptford Township High School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-25	Gloucester Manor Health Care	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-26	Deptford Center for Rehabilitation and Healthcare	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-27	Brookdale Deptford Assisted Living	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-28	Twin Cedar's Assisted Living	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-29	Brightview Woodbury Lake Assisted Living	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as initial risk reduction efforts
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures to include information regarding repetitive flood loss properties
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.3-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.3-10.

Table GC.3-10: Status of Deptford Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Deptford 1: Hardening / retrofitting EOC facility located in Municipal Building at 1101 Cooper Street.	Completed.	Project was completed through Deptford Township Capital Improvement Budget. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Deptford 2: Engineering Assessment to assess risk from Almonesson Lake Dam located on Cooper Street.	Not completed, not funded.	Multi-jurisdictional mitigation measure included in updated Municipal Appendix.	MJ-1

Table GC.3-10 Notes:

- A. See Tables GC.3-11 and GC.3-12 for municipal (M-#) mitigation measures
- B. See Table GC.3-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality

Table GC.3-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Table GC.3-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.3-4.

Table GC.3-11: Deptford Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #2	Existing
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Existing
M-5	Install permanent backup emergency power generator at Public Works Facility (CF-11).	All	Goal #4	Both

¹ See Section 3: Hazard Identification and Risk Assessment and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-6	Install permanent backup emergency power generator at Battalion 9-2: Tacoma Boulevard Fire Station (CF-6).	All	Goal #4	Existing
M-7	Install permanent backup emergency power generator at Battalion 9-3: Cooper Street Station on Almonesson Road (CF-8).	All	Goal #4	Existing
M-8	Install permanent backup emergency power generator at Battalion 9-4: Tanyard Road Fire Station (CF-9).	All	Goal #4	Existing
M-9	Install permanent backup emergency power generator at Monogahela Middle School (CF-23).	All	Goal #4	Existing
M-10	Assess backup emergency power capabilities at Police Station building (CF-3).	All	Goal #4	Existing
M-11	Engineering study to determine appropriate mitigation measure to address flooding along Gilbert Avenue (Westville Grove Area). ²	Flood	Goal #4	Both
M-12	Engineering study to determine appropriate mitigation measure to address flooding along Marian Avenue (Westville Grove Area). ²	Flood	Goal #4	Both
M-13	Address identified Repetitive Flood Loss Properties.	Flood	Goal #4	Existing
M-14	Harden main garage at Public Works Department building. (CF-11).	High Wind	Goal #4	Existing
M-15	Harden facility (new windows) for Lake Tract Elementary School (CF-21).	Hind Wind	Goal #4	Existing
M-16	Harden facility (new windows) for Deptford Township High School (CF-24).	High Wind	Goal #4	Existing
M-17	Harden facility (new windows) for Monogahela Middle School (CF-23).	High Wind	Goal #4	Existing

² Mitigation project is currently in progress. Scheduled completion date TBD.

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures

Table GC.3-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria³
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁴
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.3-12: Deptford Township (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Low	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Public Works	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish priorities, procedures, and reporting process for data collection.
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	Municipal OEM and Municipal Working Group	Low	Capabilities and Coordination	\$100K – \$500K	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.

³ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Install permanent backup emergency power generator at Public Works Facility (CF-11).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Install permanent backup emergency power generator at Battalion 9-2: Tacoma Boulevard Fire Station (CF-6).	Municipal OEM and Fire Department	Moderate	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-7	Install permanent backup emergency power generator at Battalion 9-3: Cooper Street Station on Almonesson Road (CF-8).	Municipal OEM and Fire Department	Moderate	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-8	Install permanent backup emergency power generator at Battalion 9-4: Tanyard Road Fire Station (CF-9).	Municipal OEM and Fire Department	Moderate	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-9	Install permanent backup emergency power generator at Monogahela Middle School (CF-23).	Municipal OEM and School Board	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-10	Assess backup emergency power capabilities at Police Station building (CF-3).	Municipal OEM and Police Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-11	Engineering study to determine appropriate mitigation measure to address flooding along Gilbert Avenue (Westville Grove Area).	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	< \$50K	One to three years	Develop scope of work for engineering study and procure professional consulting services.
M-12	Engineering study to determine appropriate mitigation measure to address flooding along Marian Avenue (Westville Grove Area).	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	< \$50K	One to three years	Develop scope of work for engineering study and procure professional consulting services.
M-13	Address identified Repetitive Flood Loss Properties.	Floodplain Administrator	High	Private Property Flood Mitigation	Staff time commitment	One to three years	Identify mitigation options including eligible activities per FEMA HMA programs.
M-14	Harden main garage at Public Works Department building. (CF-11).	Municipal OEM and Public Works Department	High	Building Retrofit	< \$100K	One to three years	Conduct project scoping.
M-15	Harden facility (new windows) for Lake Tract Elementary School (CF-21).	Municipal OEM and School Board	Moderate	Building Retrofit	< \$100K	Three to five years	Conduct project scoping.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-16	Harden facility (new windows) for Deptford Township High School (CF-24).	Municipal OEM and School Board	High	Building Retrofit	< \$100K	One to three years	Conduct project scoping.
M-17	Harden facility (new windows) for Monogahela Middle School (CF-23).	Municipal OEM and School Board	High	Building Retrofit	< \$100K	One to three years	Conduct project scoping.

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.3-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

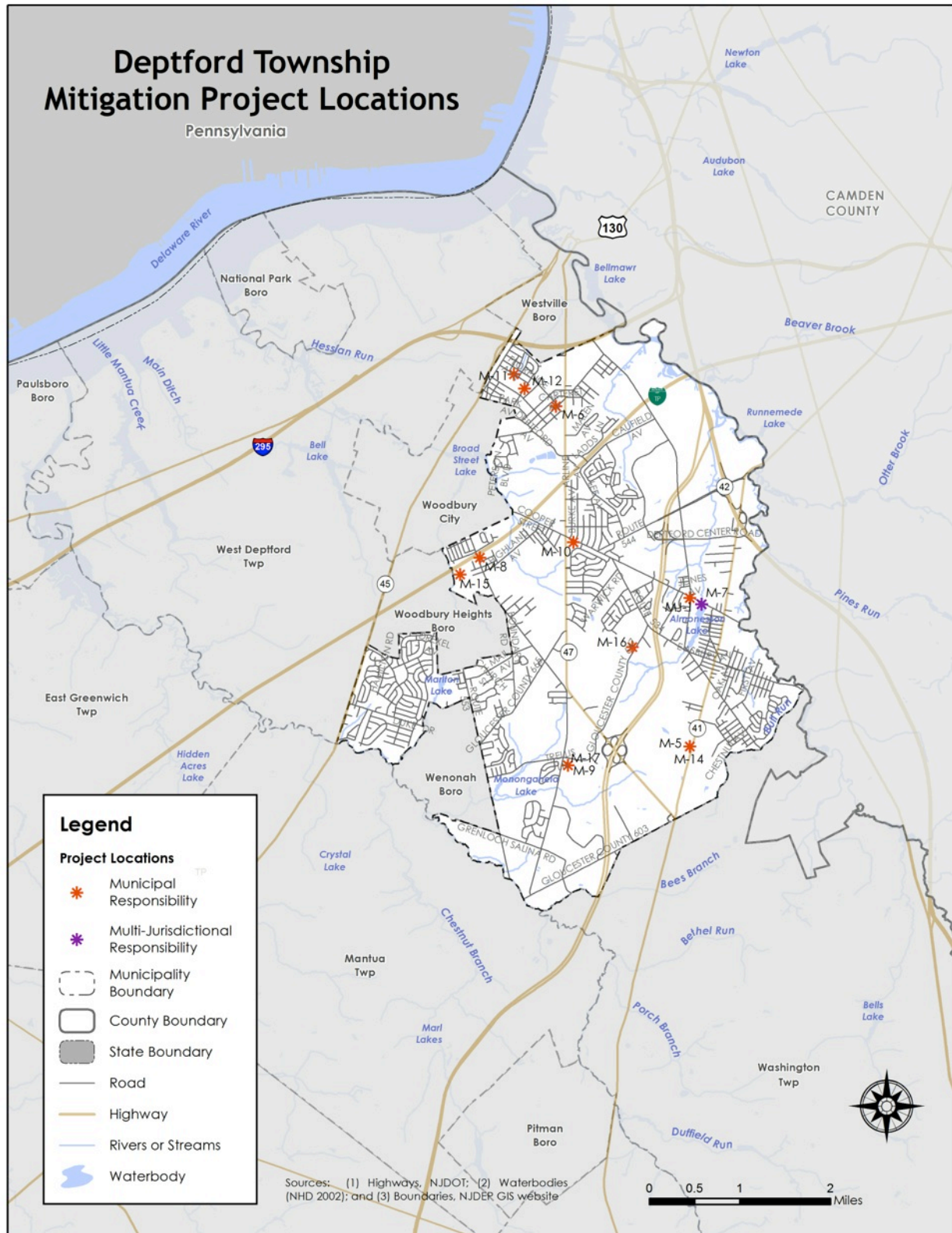
Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.3-4.

Table GC.3-13: Deptford Township (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1P	Risk assessment - Almonesson Lake Dam located on Cooper Street.	Dam Failure	Goal #4	Existing	Municipal OEM, Gloucester County DPW	Low

Part 4: Mitigation Measures

Figure GC.3-4: Deptford Township Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan (2014)
- Flood Damage Prevention Ordinance (1982)
- Master Plan (2007)
- Environmental Resources Inventory (2011)
- Unified Development Ordinance Code (2010)
- Stormwater Management Plan (2006)

Attachment A: Public Review Comments

The following comments were received during the public review of the Deptford Township Municipal Appendix:

Table GC.3.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Deptford Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.4
East Greenwich Township, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.4-i
Part 1 Overview	GC.4-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.4-1
1.2: East Greenwich Township (Gloucester County) Municipal Appendix	GC.4-1
Part 2 Participation	GC.4-2
2.1: Municipal Working Group Participation	GC.4-2
2.2: Public Participation	GC.4-4
Part 3 Hazard Identification and Risk Assessment	GC.4-5
3.1: Municipal Profile	GC.4-5
3.2: Hazard Priorities	GC.4-9
3.3: Hazard Mapping	GC.4-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.4-11
Part 4 Mitigation Measures	GC.4-16
4.1: Mitigation Goals and Strategy	GC.4-16
4.2: SDVR HMP Mitigation Measures	GC.4-17
4.3: Municipal Mitigation Measures – Identification	GC.4-18
4.4: Municipal Mitigation Measures – Implementation	GC.4-20
4.5: Multi-Jurisdictional Mitigation Measures	GC.4-23
4.6: Plan Review and Integration	GC.4-26

Table of Contents

List of Figures

Figure GC.4-1: East Greenwich Township (Gloucester County) Location Map	GC.4-5
Figure GC.4-2: East Greenwich Township Base Map	GC.4-6
Figure GC.4-3: East Greenwich Township Housing Units by Year Built	GC.4-8
Figure GC.4-4: East Greenwich Township Mitigation Project Locations	GC.4-25

List of Tables

Table GC.4-1: East Greenwich Township (Gloucester County) Working Group	GC.4-2
Table GC.4-2: Public Participation	GC.4-4
Table GC.4-3: East Greenwich Township Demographics	GC.4-7
Table GC.4-4: East Greenwich Township Demographic Rankings	GC.4-7
Table GC.4-5: East Greenwich Township Economics and Housing	GC.4-7
Table GC.4-6: East Greenwich Township Ranking (Economics and Housing)	GC.4-8
Table GC.4-7: Supporting Mapping and Exhibits	GC.4-10
Table GC.4-8: East Greenwich Township Critical Facilities Inventory	GC.4-12
Table GC.4-9: East Greenwich Township Critical Facilities Hazard Exposure	GC.4-14
Table GC.4-10: Status of East Greenwich Township SDVR HMP Mitigation Measures	GC.4-17
Table GC.4-11: East Greenwich Township Municipal Mitigation Measures Identification	GC.4-18
Table GC.4-12: East Greenwich Township Municipal Mitigation Measures Implementation	GC.4-20
Table GC.4-13: East Greenwich Township Multi-Jurisdictional Mitigation Measures	GC.4-23

Attachments

Attachment GC.4.A: Public Review Comments	GC.4.A-1
Attachment GC.4.B: Adoption Resolution	GC.4.B-1
Attachment GC.4.C: Approval Letter	GC.4.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: East Greenwich Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on East Greenwich Township in Gloucester County, New Jersey.

The East Greenwich Township Municipal Working Group recommended the East Greenwich Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The East Greenwich Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.4-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.4-1: East Greenwich Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Gerald	Hall	East Greenwich Office of Emergency Management	OEM Coordinator / Floodplain Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Dale	Archer	East Greenwich Township Committee	Mayor	<input checked="" type="checkbox"/>		
Jim	Sasetta	East Greenwich Construction Office	Construction Official		<input checked="" type="checkbox"/>	
Brian	Owen	East Greenwich Public Works	Superintendent	<input checked="" type="checkbox"/>		
Anthony	Rossett	East Greenwich Public Works	Public Works Manager	<input checked="" type="checkbox"/>		
Barry	Jenkins	East Greenwich Township Police	Chief of Police	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Chris	Everwine	East Greenwich Township Police	Deputy Chief of Police	<input checked="" type="checkbox"/>		
Nelson	Wiest	East Greenwich Township Fire / Rescue	Chief	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on October 6, 2014.

² Round 2 Work Session was held on November 5, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.4-1.

Part 2: Participation

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Engineering
- Community / Faith-Based Organizations
- Critical Infrastructure and Key Resources
- Healthcare Institutions
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Emergency Medical Services
- Business Association
- Environmental Organizations
- Non-Governmental Organizations

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.4-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.4-2: Public Participation

Date	Type of Involvement	Location
October 9, 2014	Link to Project Website (http://nj4hmp.com) established	East Greenwich Township Emergency Management ⁵
October 9, 2014	Development of Facebook Page	East Greenwich OEM ⁶
October 28, 2014	Public meeting with presentation and open discussion	East Greenwich Committee Meeting at East Greenwich Municipal Building
October 29 and November 3, 2014	Letter sent to local business owners	East Greenwich Township Businesses
November 7, 2014	Flyer Posted	Local Businesses, Township Building, & Churches
November 9, 2014	Public Outreach	Provided information to local churches to read at church services
November 12, 2014	Public meeting with presentation and open discussion	East Greenwich Committee Meeting at East Greenwich Municipal Building
November 18, 2014	Preliminary Municipal Appendix posted to website for public comment	East Greenwich Township ⁷
December 23, 2014	Public hearing included on East Greenwich Township Committee agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	East Greenwich Committee Meeting at East Greenwich Municipal Building
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁸ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁹

⁵ <http://www.eastgreenwichnj.com/more/emergency-management/>

⁶ <https://www.facebook.com/pages/East-Greenwich-Oem/1513543775558254>

⁷ <http://www.eastgreenwichnj.com/>

⁸ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁹ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

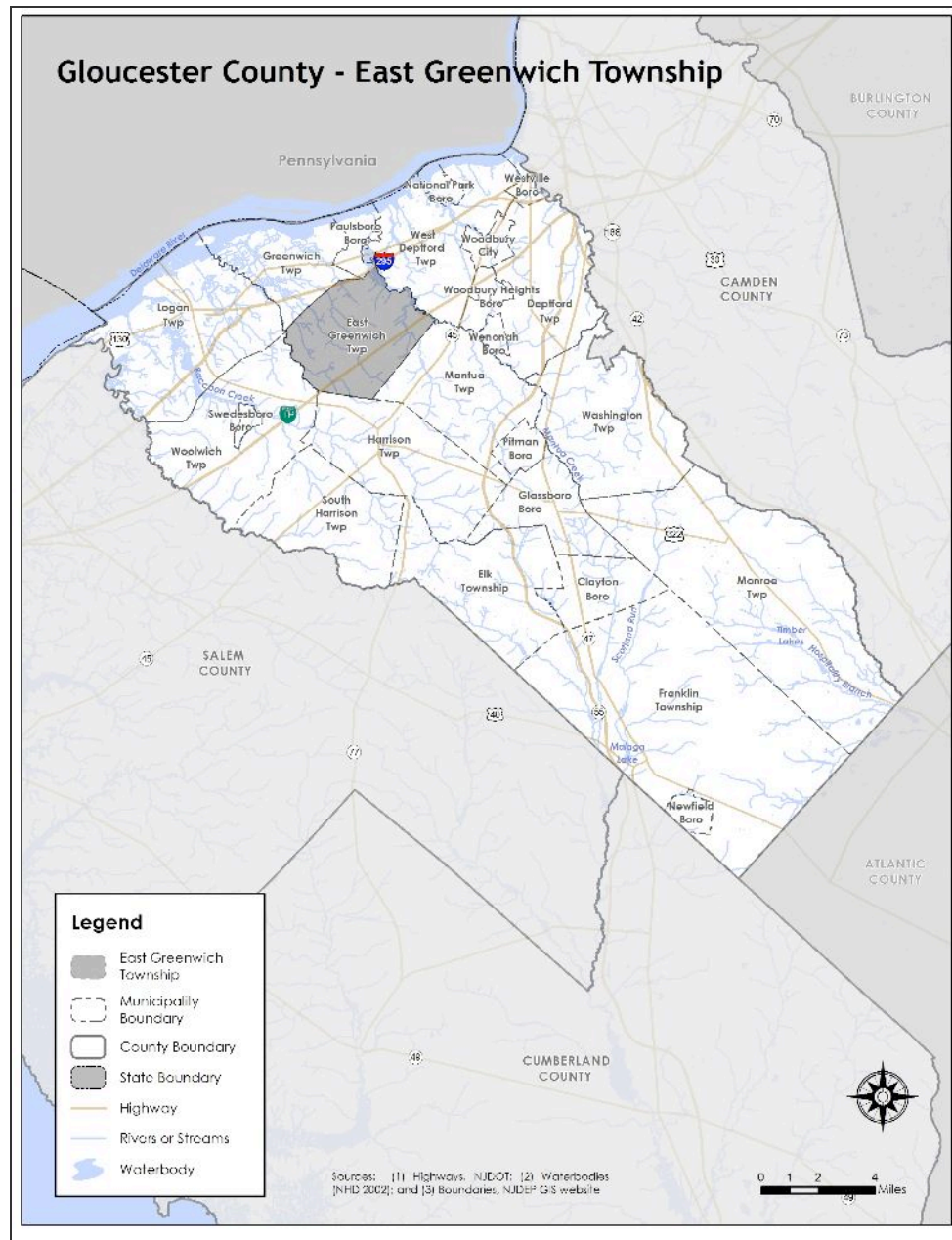
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

East Greenwich Township is located in the north-central part of Gloucester County (See Figure GC.4-1).

Figure GC.4-1: East Greenwich Township (Gloucester County) Location Map

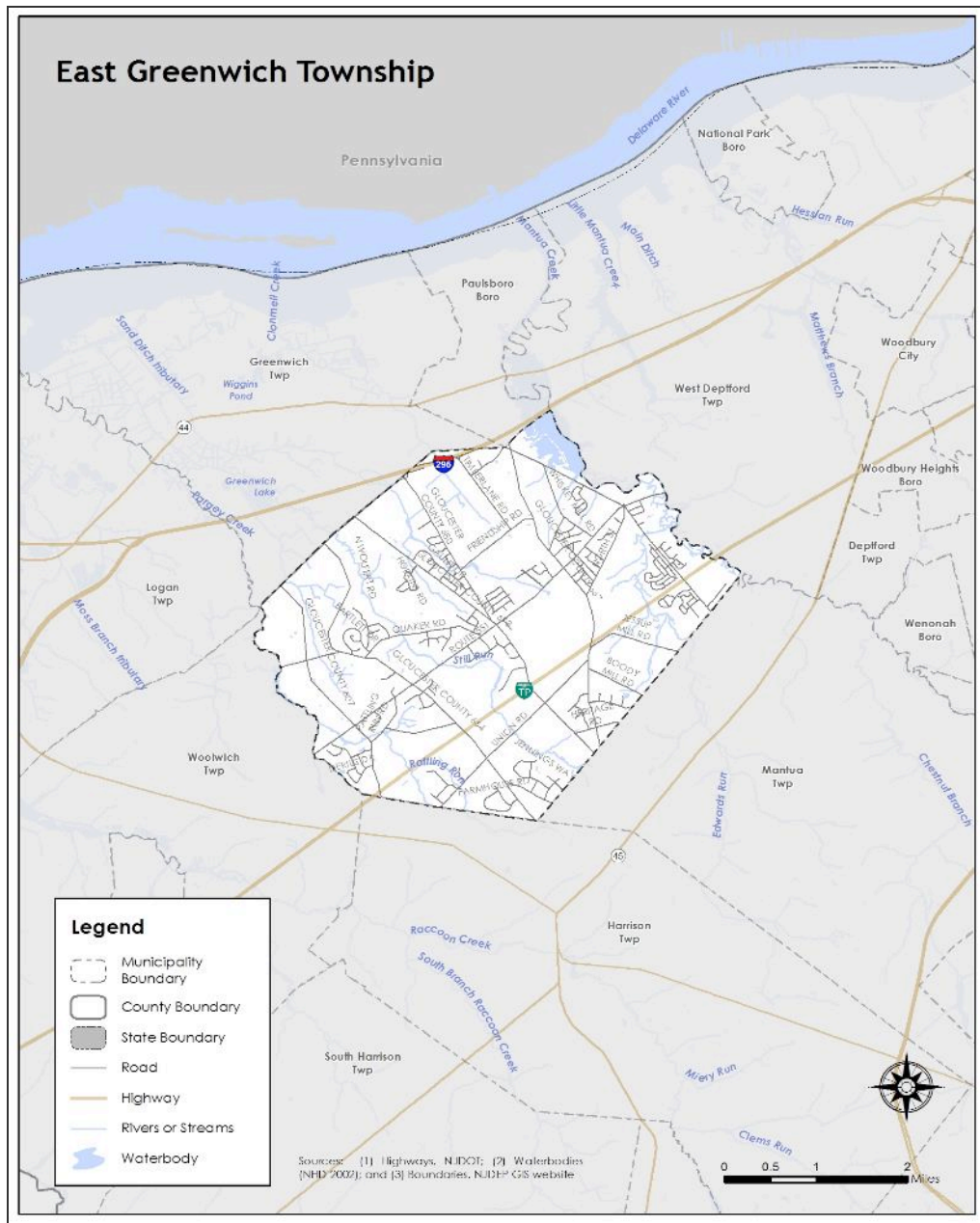


Part 3: Hazard Identification and Risk Assessment

East Greenwich Township is a rural and developing community. With large portions of agricultural and environmentally sensitive areas, East Greenwich is balancing a growing population, while maintaining its rural character. Unincorporated communities in the municipality include Clarksboro, Mickleton, and Mount Royal. Additionally, industrial railroads run through East Greenwich Township.

Per Figure GC.4-2, the major water courses include Mantua Creek and Rattling Run. Major transportation routes include the New Jersey Turnpike, Gloucester County routes 664, 295, and 620 (Kings Highway), and the following municipal roads: Harmony Road, Cedar Road, and Democrat Road. The land is predominantly flat.

Figure GC.4-2: East Greenwich Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.4-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.4-3: East Greenwich Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	East Greenwich Township	Gloucester County	Region	New Jersey
2000 Population	5,430	254,673	974,328	8,414,350
2010 Population	9,555	288,288	1,024,926	8,791,894
Percent Change	75.97%	13.2%	5.19%	4.49%
Population Density	661.7 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	14.40 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	27.3	24.4	24.1	23.5
% of Population 18 – 64	62.2	63.2	62.7	63
% of Population 65 and over	10.5	12.4	13.2	13.5

Table GC.4-4 illustrates how East Greenwich Township ranks in the county, the four county region, and New Jersey.

Table GC.4-4: East Greenwich Township Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	11	29	249
Land Area Rank	12	38	172
Population Density Rank	17	58	417
Population Change Rank	2	2	-

Table GC.4-5 includes information related to economic and housing statistics for East Greenwich Township, Gloucester County, the four county region, and New Jersey.

Table GC.4-5: East Greenwich Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	East Greenwich Township	Gloucester County	Region	New Jersey
Date Incorporated	February 10, 1881	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$98,295	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	3,405	109,796	397,990	3,529,033
Occupied Housing Units	3,262	104,271	372,472	3,176,069
Vacant Housing Units	143	5,525	25,518	352,964
Owner Occupied Housing Units	2,996	83,525	266,593	2,126,279

Part 3: Hazard Identification and Risk Assessment

	East Greenwich Township	Gloucester County	Region	New Jersey
Renter Occupied Housing Units	266	20,746	105,879	1,049,790
Building Permits	91	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

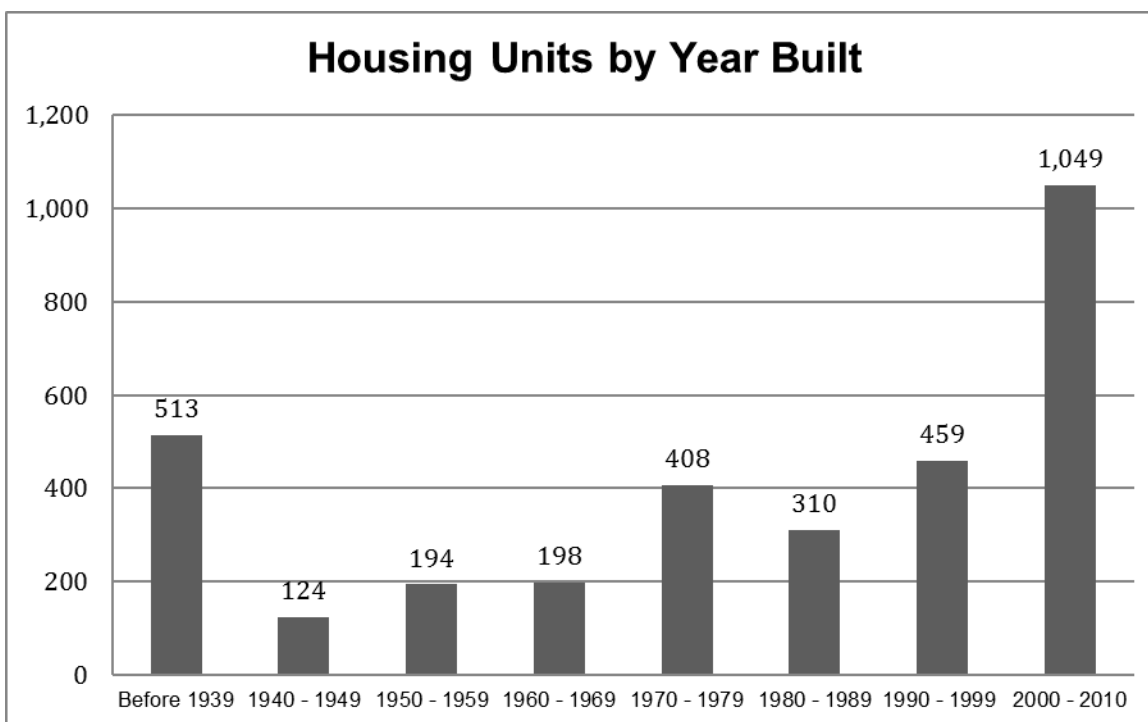
Table GC.4-6 illustrates how East Greenwich Township ranks in the county and the four county region.

Table GC.4-6: East Greenwich Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	5	7
Vacant Housing Rank	14	46
Renter Occupied Housing Rank	17	61
Building Permits	3	4

Figure GC.4- illustrates development patterns in East Greenwich Township by examining housing units by year built. About 30% of homes in East Greenwich Township were built during the 2000s.

Figure GC.4-3: East Greenwich Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Drought
- Flood

Moderate Priority

- Extreme Temperature: Cold & Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Low Priority

- Earthquake
- Levee Failure

Four additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion and Sea Level Rise
- Dam Failure
- Geologic Hazards
- Wildfire

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.4-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.4-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge)	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where inundation due to storm surge may occur

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.4-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.4-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.4-8: East Greenwich Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Jack F. Haegele Township Hall	Municipal	Administrative Offices	159 Democrat Road, Mickleton		Y	Y		
CF-2	Amos J. Peaslee Jr. Municipal Annex	Municipal	Administrative Offices	21 East Cohawkin Road, Clarksboro					
CF-3	Emergency Operations Center	EOC	Co-located Facilities	21 East Cohawkin Road, Clarksboro	CF-2	N	Y		
CF-4	Police Station	Law Enforcement Facilities	Stations	159 Democrat Road, Mickleton	CF-1	Y	Y		
CF-5	East Greenwich Township Fire and Rescue – Mantua Road Station	FireStation	Stations	5 Mantua Road, Mount Royal		N	Y		
CF-6	East Greenwich Township Fire and Rescue – Cohawkin Road Station	Fire Station	Stations	5 West Cohawkin Road, Clarksboro		N	Y		M-5
CF-7	EMS	EMS	Municipal Stations	21 East Cohawkin Road, Clarksboro	CF-2	N	Y		
CF-8	Public Works	Public Works	Administrative Offices	159 Democrat Road, Mickleton	CF-1	N	Y		
CF-9	Public Works Garage	Public Works	Equipment / Material Storage	East Wolfert Station Road, Mickleton		N	N		
CF-10	Municipal - Pump Station #1	Utilities – Wastewater	Pump Stations / Lift Stations	120 Gaunt Drive, Mickleton		N/A		Portable generator	
CF-11	Municipal - Pump Station #2	Utilities – Wastewater	Pump Stations / Lift Stations	409 Village Court, Mickleton		N/A		Portable generator	
CF-12	Municipal - Pump Station #3	Utilities – Wastewater	Pump Stations / Lift Stations	65 Beckley Road, Mount Royal		N/A		Portable generator	
CF-13	Municipal - Pump Station #4	Utilities – Wastewater	Pump Stations / Lift Stations	200 County House Road, Clarksboro		N/A		Portable generator	
CF-14	Municipal - Pump Station #5	Utilities – Wastewater	Pump Stations / Lift Stations	537 Herreford Lane, Mickleton		N/A		Portable generator	
CF-15	Municipal - Pump Station #6	Utilities – Wastewater	Pump Stations / Lift Stations	499 Fox Hollow Court, Mickleton		N/A		Portable generator	
CF-16	Municipal - Pump Station #7	Utilities – Wastewater	Pump Stations / Lift Stations	83 Woodbury Court, Clarksboro		N/A		Portable generator	

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-17	Municipal – Well #2	Utilities – Water	Wellhead	21 East Cohawkin Road, Clarksboro	CF-2	N/A			
CF-18	Municipal – Well #3	Utilities – Water	Wellhead	185 County House Road, Mount Royal		N/A	N		M-6
CF-19	Municipal – Well #4	Utilities – Water	Wellhead	96 East Rattling Run, Mickleton		N/A	N		M-7
CF-20	Municipal - Water Tower #1	Utilities – Water	Water Towers	101 East Cohawkin Road, Clarksboro		N/A			
CF-21	Municipal - Water Tower #1	Utilities – Water	Water Towers	96 East Rattling Road, Mickleton		N/A			
CF-22	Samuel Mickle Elementary School	Schools	Public Schools	513 Cohawkin Road, Mullica Hill		Y	Y		
CF-23	Jeffrey Clark School	Schools	Public Schools	405 Station Court, Mullica Hill		Y	Y		
CF-24	AdvoServ Adult Facility for Special Needs	Vulnerable Populations	Private / Non-Profit Group Homes	45 Fostertown Lane, Mullica Hill		N ²	Y		
CF-25	AdvoServ Adult Facility for Special Needs	Vulnerable Populations	Private / Non-Profit Group Homes	304 Stayman Court, Mullica Hill		N ²	Y		
CF-26	Toddlers N Tots Private Preschool	Vulnerable Populations	Private Child Day Care	270 Landing Road, Clarksboro		N	N		M-8
CF-27	Little Angels Daycare & Learning Center	Vulnerable Populations	Private Child Day Care	203 Kings Highway, Mount Royal		N			

² Shelter in place.

Part 3: Hazard Identification and Risk Assessment

Table GC.4-9: East Greenwich Township (Gloucester County) Critical Facilities Hazard Exposure³

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Jack F. Haegele Township Hall	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-2	Amos J. Peaslee Jr. Municipal Annex	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-3	Emergency Operations Center	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-4	Police Station	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-5	East Greenwich Township Fire and Rescue – Mantua Road Station	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-6	East Greenwich Township Fire and Rescue – Cohawkin Road Station	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-7	EMS	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-8	Public Works	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-9	Public Works Garage	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-10	Municipal - Pump Station #1	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-11	Municipal - Pump Station #2	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-12	Municipal - Pump Station #3	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-13	Municipal - Pump Station #4	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-14	Municipal - Pump Station #5	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-15	Municipal - Pump Station #6	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A

³ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-16	Municipal - Pump Station #7	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-17	Municipal – Well #2	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-18	Municipal – Well #3	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-19	Municipal – Well #4	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-20	Municipal - Water Tower #1	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-21	Municipal - Water Tower #1	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-22	Samuel Mickle Elementary School	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-23	Jeffrey Clark School	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-24	AdvoServ Adult Facility for Special Needs	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-25	AdvoServ Adult Facility for Special Needs	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-26	Toddlers N Tots Private Preschool	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A
CF-27	Little Angels Daycare & Learning Center	N/A	N/A	N/A	N/A	N/A							N/A	N/A	N/A

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as initial risk reduction efforts
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures to include repetitive flood loss properties
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.4-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.4-10.

Table GC.4-10: Status of East Greenwich Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
N/A	N/A	East Greenwich Township did not participate in the SDVR Hazard Mitigation Plan. Therefore there are no mitigations measures that were previously identified for the municipality.	N/A

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality

Table GC.4-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Table GC.4-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.4-4.

Table GC.4-11: East Greenwich Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site surveys to identify vulnerabilities.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #2	Both
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-5	Install permanent backup emergency power at East Greenwich Fire Department on Cohawkin Road (CF-6). ²	All	Goal #4	Both

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² Project included in Letter of Interest (LOI) for DR 4086 HMGP. LOI project budget 2063 = \$646,500.00.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-6	Install permanent backup emergency power at Public Works Well #3 (CF-18).	All	Goal #4	Both
M-7	Install permanent backup emergency power at Public Works Well #4 (CF-19).	All	Goal #4	Both
M-8	Install permanent backup emergency power at Toddlers N Tots Private Preschool (CF-26).	All	Goal #4	Both
M-9	Purchase tow for emergency generator.	All	Goal #4	New
M-10	Purchase of portable backup emergency power generators for special needs groups.	All	Goal #4	New
M-11	Purchase dog cages / kennels for evacuations.	All	Goal #4	New
M-12	Dredge stream behind Howard Drive.	Flood	Goal #4	Existing
M-13	Upgrade drainage / cross drain at Friendship Road.	Flood	Goal #4	Both
M-14	Install drainage system on Jessop Mill Road.	Flood	Goal #4	New
M-15	Purchase 6" bypass pump.	Flood	Goal #4	New
M-16	Purchase of road closure signs with stands.	Flood	Goal #4	New
M-17	Purchase sump pumps for flooded homes.	Flood	Goal #4	New
M-18	Purchase of sandbags / barricades.	Flood	Goal #4	New
M-19	Address identified Repetitive Flood Loss Properties.	Flood	Goal #4	Existing
M-20	Purchase chainsaws for tree removal.	High Wind	Goal #4	New

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures

Table GC.4-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria³
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁴
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.4-12: East Greenwich Township (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none"> • Current hazards and risks • Changing conditions and actions that may reduce / increase risk • Best practices for hazard mitigation at the individual or property level. 	Municipal OEM	Moderate	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site surveys to identify vulnerabilities.	Municipal OEM and Facility Managers	High	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.

³ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Public Works	High	Capabilities and Coordination	Staff time commitment	On-going	Establish priorities, procedures, and reporting process for data collection.
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	Municipal OEM and Municipal Working Group	Low	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.
M-5	Install permanent backup emergency power generator at East Greenwich Fire Department on Cohawkin Road (CF-6).	Municipal OEM and Fire Department	High	Back-up Emergency Power Generator	< \$100K	One to five year	Conduct project scoping.
M-6	Install permanent backup emergency power generator at Public Works Well #3 (CF-18).	Municipal OEM	High	Back-up Emergency Power Generator	< \$100K	One to five year	Conduct project scoping.
M-7	Install permanent backup emergency power generator at Public Works Well #4 (CF-19).	Municipal OEM	High	Back-up Emergency Power Generator	< \$100K	One to five year	Conduct project scoping.
M-8	Install permanent backup emergency power generator at Toddlers N Tots Private Preschool (CF-26).	Toddlers N Tots Private Preschool	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-9	Purchase tow for emergency generator.	Municipal OEM	Moderate	Equipment purchase	< \$50K	Three to five years	Provide specifications to purchasing department and participate in procurement process.
M-10	Purchase of portable backup emergency power generators for special needs groups.	Municipal OEM and Fire Department	Moderate	Back-up Emergency Power Generator	< \$100K	Three to five years	Provide specifications to purchasing department and participate in procurement process.
M-11	Purchase dog cages / kennels for evacuations.	Fire Department and Public Works	Moderate	Equipment purchase	< \$50K	Three to five years	Provide specifications to purchasing department and participate in procurement process.
M-12	Dredge stream behind Howard Drive.	Municipal OEM	Moderate	Private Property Flood Mitigation	< \$100K	Three to five years	Conduct project scoping.
M-13	Upgrade drainage / cross drain at Friendship Road.	Municipal OEM	Moderate	Public Property Flood Mitigation	< \$100K	Three to five years	Conduct project scoping.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-14	Install drainage system on Jessop Mill Road.	Municipal OEM,	Moderate	Private Property Flood Mitigation	\$100K – \$1M	Three to five years	Conduct project scoping.
M-15	Purchase 6" bypass pump.	Municipal OEM, Fire Department, and Public Works	Moderate	Equipment purchase	< \$50K	Three to five years	Provide specifications to purchasing department and participate in procurement process.
M-16	Purchase of road closure signs with stands.	Fire Department	Moderate	Equipment purchase	< \$50K	Three to five years	Provide specifications to purchasing department and participate in procurement process.
M-17	Purchase sump pumps for flooded homes.	Fire Department	Moderate	Equipment purchase	< \$50K	Three to five years	Provide specifications to purchasing department and participate in procurement process.
M-18	Purchase of sandbags / barricades.	Fire Department and Public Works	Moderate	Equipment purchase	< \$50K	Three to five years	Provide specifications to purchasing department and participate in procurement process.
M-19	Address identified Repetitive Flood Loss Properties.	Floodplain Administrator	Low	Private Property Flood Mitigation	Staff time commitment	Three to five years	Identify mitigation options including eligible activities per FEMA HMA programs.
M-20	Purchase chainsaws for tree removal.	Fire Department	Moderate	Equipment purchase	< \$50K	Three to five years	Provide specifications to purchasing department and participate in procurement process.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.4-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

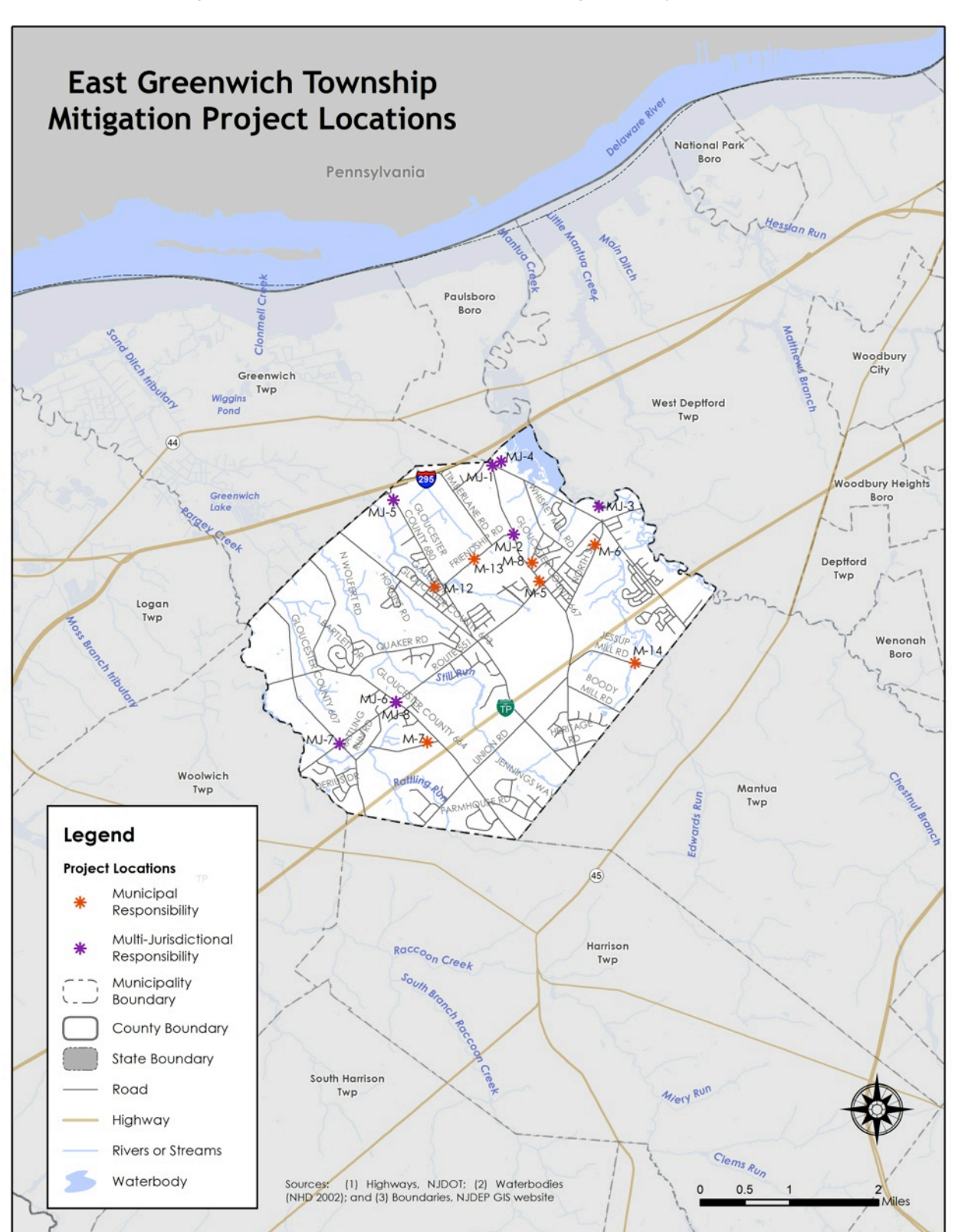
Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.4-4.

Table GC.4-13: East Greenwich Township (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Alleviate flooding at Berkly Road & West Cohawkin Road.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-2	Alleviate flooding at West Cohawkin Road and Friendship Road.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-3	Beaver dams at Union Road bridge.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Low
MJ-4	Alleviate flooding at Berkely Road and Boat Ramp at Mantua Creek.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-5	Improve storm drainage at Harmony Road.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-6	Improve storm drainage on Democrat Road.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate

Part 4: Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-7	Fatal accidents at Kings Highway and Tomlin Station Road.		Goal #4	Both	Municipal OEM, Gloucester County DPW	High
MJ-8	Fatal accidents at Kings Highway and Wolfert Station Road.		Goal #4	Both	Municipal OEM, Gloucester County DPW	High



Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Comprehensive Master Plan (2004)
- Emergency Operations Plan (2012)
- Floodplain Ordinance
- Land Development Ordinances
- Redevelopment and Rehabilitation Plan (2011)
- Zoning Map (2010)

Attachment A: Public Review Comments

The following comments were received during the public review of the East Greenwich Township Municipal Appendix:

Table GC.4.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the East Greenwich Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.5
Elk Township, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.5-i
Part 1 Overview	GC.5-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.5-1
1.2: Elk Township (Gloucester County) Municipal Appendix	GC.5-1
Part 2 Participation	GC.5-2
2.1: Municipal Working Group Participation	GC.5-2
2.2: Public Participation	GC.5-4
Part 3 Hazard Identification and Risk Assessment	GC.5-5
3.1: Municipal Profile	GC.5-5
3.2: Hazard Priorities	GC.5-9
3.3: Hazard Mapping	GC.5-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.5-11
Part 4 Mitigation Measures	GC.5-14
4.1: Mitigation Goals and Strategy	GC.5-14
4.2: SDVR HMP Mitigation Measures	GC.5-15
4.3: Municipal Mitigation Measures – Identification	GC.5-16
4.4: Municipal Mitigation Measures – Implementation	GC.5-18
4.5: Multi-Jurisdictional Mitigation Measures	GC.5-20
4.6: Plan Review and Integration	GC.5-22

Table of Contents

List of Figures

Figure GC.5-1: Elk Township (Gloucester County) Location Map	GC.5-5
Figure GC.5-2: Elk Township Base Map	GC.5-6
Figure GC.5-3: Elk Township Housing Units by Year Built	GC.5-8
Figure GC.5-4: Elk Township Mitigation Project Locations	GC.5-21

List of Tables

Table GC.5-1: Elk Township (Gloucester County) Working Group	GC.5-2
Table GC.5-2: Public Participation	GC.5-4
Table GC.5-3: Elk Township Demographics	GC.5-7
Table GC.5-4: Elk Township Demographic Rankings	GC.5-7
Table GC.5-5: Elk Township Economics and Housing	GC.5-7
Table GC.5-6: Elk Township Ranking (Economics and Housing)	GC.5-8
Table GC.5-7: Supporting Mapping and Exhibits	GC.5-10
Table GC.5-8: Elk Township Critical Facilities Inventory	GC.5-12
Table GC.5-9: Elk Township Critical Facilities Hazard Exposure	GC.5-13
Table GC.5-10: Status of Elk Township SDVR HMP Mitigation Measures	GC.5-15
Table GC.5-11: Elk Township Municipal Mitigation Measures Identification	GC.5-17
Table GC.5-12: Elk Township Municipal Mitigation Measures Implementation	GC.5-18
Table GC.5-13: Elk Township Multi-Jurisdictional Mitigation Measures	GC.5-20

Attachments

Attachment GC.5.A: Public Review Comments	GC.5.A-1
Attachment GC.5.B: Adoption Resolution	GC.5.B-1
Attachment GC.5.C: Approval Letter	GC.5.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Elk Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Elk Township in Gloucester County, New Jersey.

The Elk Township Municipal Working Group recommended the Elk Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Elk Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.5-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.5-1: Elk Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Kevin	Keen	Elk Township OEM / Elk Township Fire Department	OEM Coordinator / Fire Fighter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Milton	Sahms	Elk Township OEM	Deputy OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Jay	Hughes	Elk Township OEM	OEM Department Staff	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Stan	Bitgood	Elk Township Engineering - Federici and Akin, P.A	Floodplain Administrator			The Floodplain Administrator reviewed the Preliminary Municipal Appendix and provided review comments that were incorporated in the Draft Municipal Appendix.
Charles	DeFalco	Elk Township Police Department	Chief of Police	<input checked="" type="checkbox"/>		

¹ Round 1 Work Session was held on July 15, 2014.

² Round 2 Work Session was held on October 7, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.5-1.

Part 2: Participation

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Elected Officials
- Land Use / Economic Development Planner
- Building Code Official
- Engineering
- Public Works
- Community / Faith-Based Organizations
- Major Employers and businesses
- Healthcare Institutions
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Emergency Medical Services
- Transportation Department Directors / Supervisors
- Business Associations
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Major Employers and Businesses

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.5-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.5-2: Public Participation

Date	Type of Involvement	Location
August 7, 2014	Link to Project Website (http://nj4hmp.com) established	Elk Township, NJ ⁵
January 2015	Flyers posted	Municipal Building
March 2015	Information item included on Local Emergency Preparedness Council agenda identifying opportunities for public participation	Aura Volunteer Fire Company Hall
February 5, 2015	Public meeting with presentation and open discussion	Municipal Building Courtroom
November 20, 2014	Preliminary Municipal Appendix posted to website for public comment	Elk Township, NJ ⁵
January 20, 2015	Public hearing included on Elk Township Committee agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Municipal Building Courtroom
[date to be determined in 2015]	Public meeting for plan adoption	Municipal Building Courtroom

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁶ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁷

⁵ <http://www.elktownshipnj.gov/>

⁶ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁷ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

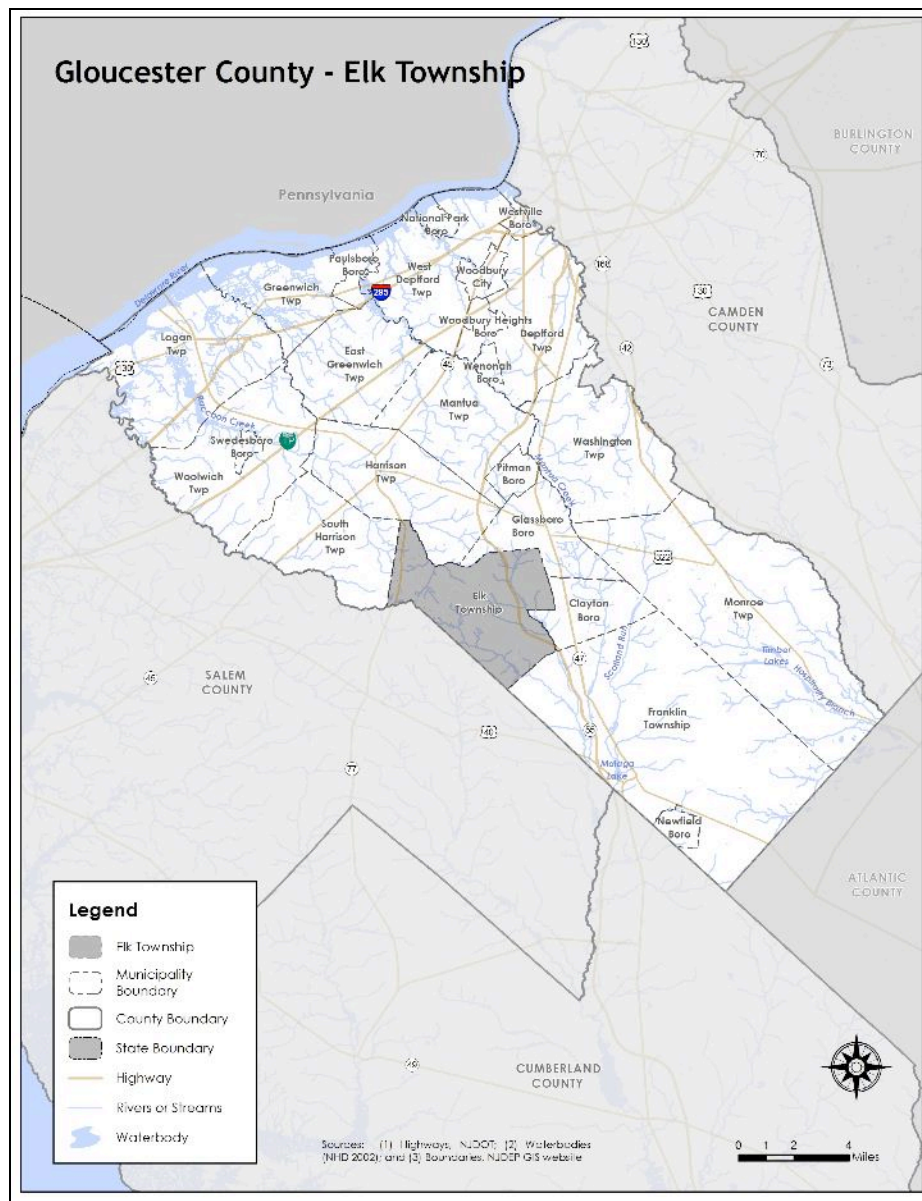
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Elk Township is located in the west-central part of Gloucester County (See Figure GC.5-1).

Figure GC.5-1: Elk Township (Gloucester County) Location Map

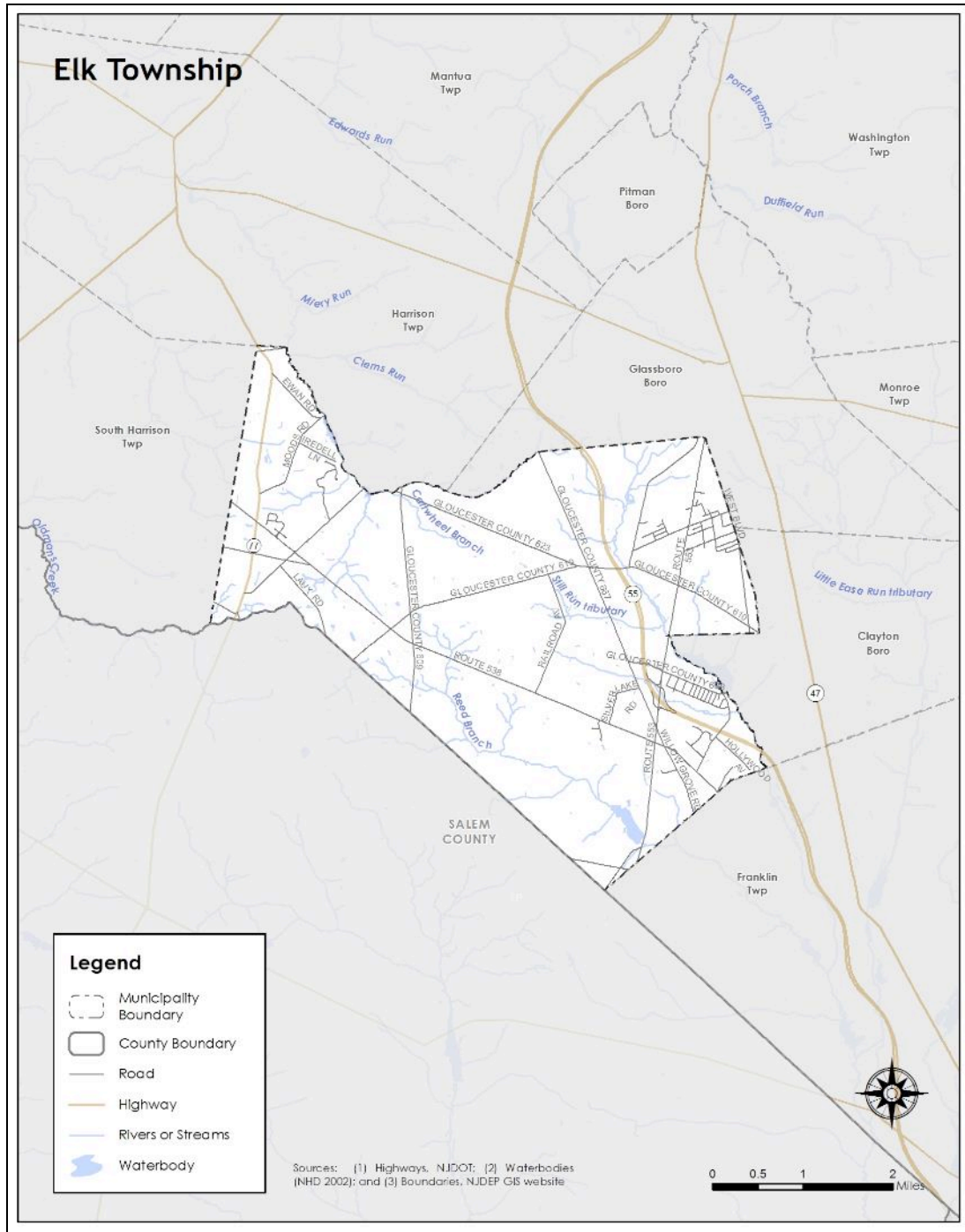


Part 3: Hazard Identification and Risk Assessment

Elk Township is a rural and agricultural community with growing residential areas. Unincorporated communities in the municipality include: Aura, Ferrell, Hardingville, and Wrights Mill.

Per Figure GC.5-2, the major water courses include Cartwheel Branch and Reed Branch. Major transportation routes include State Highways 55 and 77, County routes 553 and 530. The land is gently rolling with a large percentage of the municipality utilized for agriculture.

Figure GC.5-2: Elk Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.5-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.5-3: Elk Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Elk Township	Gloucester County	Region	New Jersey
2000 Population	3,514	254,673	974,328	8,414,350
2010 Population	4,216	288,288	1,024,926	8,791,894
Percent Change	19.98%	13.2%	5.19%	4.49%
Population Density	216.3 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	19.50 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	23.8	24.4	24.1	23.5
% of Population 18 - 64	64.2	63.2	62.7	63
% of Population 65 and over	12.0	12.4	13.2	13.5

Table GC.5-4 illustrates how Elk Township ranks in the county, the four county region, and New Jersey.

Table GC.5-4: Elk Township Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	18	56	404
Land Area Rank	6	27	141
Population Density Rank	23	69	498
Population Change Rank	7	10	-

Table GC.5-5 includes information related to economic and housing statistics for Elk Township, Gloucester County, the four county region, and New Jersey.

Table GC.5-5: Elk Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Elk Township	Gloucester County	Region	New Jersey
Date Incorporated	April 17, 1891	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$63,194	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	1,576	109,796	397,990	3,529,033
Occupied Housing Units	1,474	104,271	372,472	3,176,069
Vacant Housing Units	102	5,525	25,518	352,964
Owner Occupied Housing Units	1,320	83,525	266,593	2,126,279
Renter occupied Housing Units	154	20,746	105,879	1,049,790
Building Permits	12	716	1,554	13,535

Part 3: Hazard Identification and Risk Assessment

	Elk Township	Gloucester County	Region	New Jersey
Largest Industry	Agriculture, forestry, fishing and hunting	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

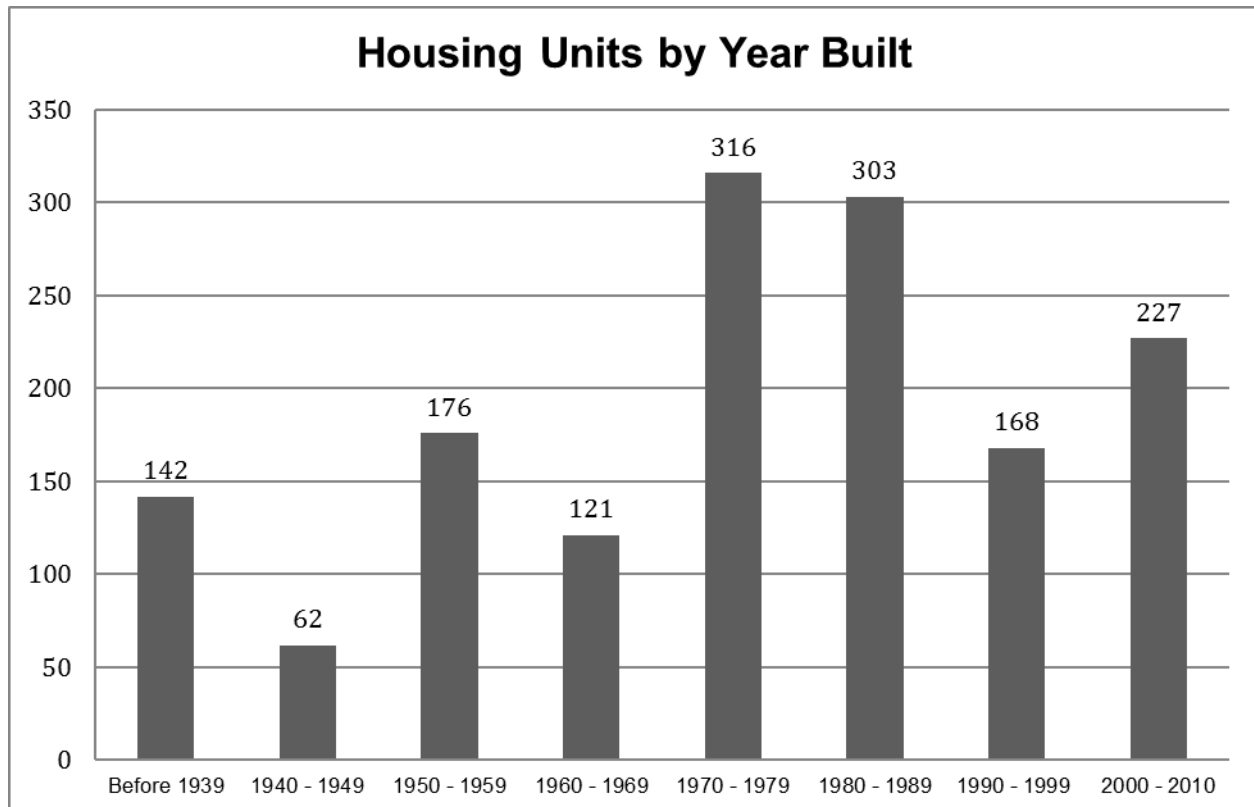
Table GC.5-6 illustrates how Elk Township ranks in the county and the four county region.

Table GC.5-6: Elk Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	19	47
Vacant Housing Rank	16	55
Renter Occupied Housing Rank	19	70
Building Permits Rank	10	27

Figure GC.5-3 illustrates development patterns in Elk Township by examining housing units by year built. One in five homes in Elk Township were built during the 1970s.

Figure GC.5-3: Elk Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- None

Moderate Priority

- Dam Failure
- Drought
- Extreme Temperature: Cold & Hot
- High Wind
- Severe Weather – Summer
- Severe Storm – Winter Weather

Low Priority

- Earthquake
- Flood
- Wildfire

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion and Sea Level Rise
- Geologic Hazards
- Levee Failure

¹ See *Section 3: Hazard Identification and Risk Assessment*.

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.5-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.5-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.5-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.5-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.5-8: Elk Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Township Hall	Municipal	Administrative Offices	680 Whig Lane, Monroeville		N	Y		
CF-2	Emergency Operations Center	EOC	Co-located Facilities	680 Whig Lane, Monroeville	CF-1	N	Y		
CF-3	Police Station	Law Enforcement Facilities	Stations	680 Whig Lane, Monroeville	CF-1	N ²	Y	Includes a holding cell	
CF-4	39-1 Fire Station	Fire Station	Stations	909 Aura Road, Monroeville		Y ²	N		M-5
CF-5	39-2 Fire Station	Fire Station	Stations	186 Elk Road, Monroeville		Y ²	N		M-6
CF-6	39-3 Fire Station	Fire Station	Stations	31 Stranger Avenue, Glassboro		Y ²	Y		
CF-7	Public Works Garage & Yard	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	680 Whig Lane, Monroeville	CF-1	N	Y		
CF-8	Aura Elementary School	Schools	Public Schools	900 Clems Run, Monroeville		Y	Y	Primary identified shelter	
CF-9	Bambi Preschool	Vulnerable Populations Facilities	Private Child Day Care	220 Harrisonville Way, Mullica Hill		N	N		

² Shelter of last resort.

Part 3: Hazard Identification and Risk Assessment

Table GC.5-9: Elk Township (Gloucester County) Critical Facilities Hazard Exposure³

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Township Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-3	Police Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-4	39-1 Fire Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-5	39-2 Fire Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-6	39-3 Fire Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-7	Public Works Yard	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-8	Aura Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-9	Bambi Preschool	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

³ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as initial risk reduction efforts
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures to include information regarding Repetitive Flood Loss properties and dam monitoring and maintenance
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.5-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.5-10.

Table GC.5-10: Status of Elk Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Elk 1: Engineering assessment to assess risk from dam located in Lake Garrison on County Road Route 553.	Not completed, not funded.	Dam is privately owned and managed through Lake Association. In addition, County Route 553 forms part of the dam embankment crest and the bridge immediately downstream of the dam. Therefore, an associated multi-jurisdictional mitigation measure is included in the Municipal Appendix.	MJ-1
Elk 2: Engineering assessment to assess risk from dam on Lake Gilman on County Road Route 641.	Work-in-progress.	Gloucester County conducted an assessment of Lake Gilman Dam. Dam is privately owned, however a dam failure could impact Gloucester County Route 641, Elk Township roads, and Harrison Township. Board of Freeholders Resolution B-13 6/18/08 set out the agreement between Gloucester County and Lake Gilman Association regarding shared costs for rehabilitation. Therefore, an associated multi-jurisdictional mitigation measure is included in the Municipal Appendix.	MJ-2
Elk 3: Engineering assessment to assess risk from Hackney Dam, 431 Richwood Road and County Route 609.	Not completed, not funded.	Dam is privately owned and borders both Elk Township and Harrison Township. Therefore, an associated mitigation measure is included in the Municipal Appendix as a municipal education and outreach project and as a multi-jurisdictional risk assessment project.	M-7 / MJ-3
Elk 4: Retrofitting/ hardening of data storage facility located in Municipal Building on County Road, Route 667.	Completed.	Project completed through Capital Improvement funds. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Elk 5: Engineering assessment to assess risk from dam on Silver Lake on Route 608 shared with Gilman municipality.	Not completed, not funded.	Mitigation measure requires multi-jurisdictional approach with Clayton Borough (incorrectly identified in SDVR HMP as “Gilman municipality”). Therefore, mitigation measure is included in updated Municipal Appendix.	MJ-4

Part 4: Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Elk 6: Engineering assessment to assess risk from Ewan Lake Dam—shared with Harrison municipality.	Not completed, not funded.	Elk Township has presented documentation to NJDEP that the Township does not share in the ownership of Ewan Lake Dam. Mitigation measure requires multi-jurisdictional approach. Therefore, mitigation measure is included in updated Municipal Appendix.	MJ-5

Table GC.5-10 Notes:

- A. See Tables GC.5-11 and GC.5-12 for municipal (M-#) mitigation measures
 B. See Table GC.5-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality

Table GC.5-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Table GC.5-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.5-4.

¹ See Section 3: Hazard Identification and Risk Assessment and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

Part 4: Mitigation Measures

Table GC.5-11: Elk Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none"> • Current hazards and risks • Changing conditions and actions that may reduce / increase risk to include monitoring and maintenance of privately owned dams • Best practices for hazard mitigation at the individual or property level to include properties with dams. 	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #2	Existing
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-5	Install permanent backup emergency power generator at Fire Station 39-1 (CF-4).	All	Goal #4	Existing
M-6	Install permanent backup emergency power generator at Fire Station 39-2 (CF-5).	All	Goal #4	Existing
M-7	Follow-up with landowner of Hackney Dam located on Richwood Road and County Route 609 re: potential mitigation options.	Dam Failure	Goal #4	Existing
M-8	Address identified Repetitive Flood Loss Properties.	Flood	Goal #4	Both

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures

Table GC.5-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria²
- Project Type to help determine funding options and implementation mechanisms at the municipal level³
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.5-12: Elk Township (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk to include monitoring and maintenance of privately owned dams• Best practices for hazard mitigation at the individual or property level to include properties with dams.	Municipal OEM	Low	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none">▪ Work with County Working Group to identify resource needs and availability.▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.

² See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

³ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Public Works	Low	Capabilities and Coordination	Staff time commitment	On-going	Establish priorities, procedures, and reporting process for data collection.
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.
M-5	Install permanent backup emergency power generator at Fire Station 39-1 (CF-4).	Municipal OEM	Moderate	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-6	Install permanent backup emergency power generator at Fire Station 39-2 (CF-5).	Municipal OEM and Fire Department	Moderate	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-7	Follow-up with landowner of Hackney Dam located on Richwood Road and County Route 609 re: potential mitigation options.	Municipal OEM and Hackney Dam Owners	Low	Private Property Flood Mitigation	< \$100K	Three to five years	Follow-up with NJDEP Dam Safety to verify status of EAP and inundation mapping and adequacy of emergency notification lists. Then, pending results, coordinate with Owner to determine needs and options for mitigation.
M-8	Address identified Repetitive Flood Loss Properties.	Floodplain Administrator	Moderate	Private Property Flood Mitigation	< \$5K	Three to five years	Prior to initiating landowner contacts, identify flood insurance implications and mitigation options including eligible activities per FEMA HMA programs.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.5-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

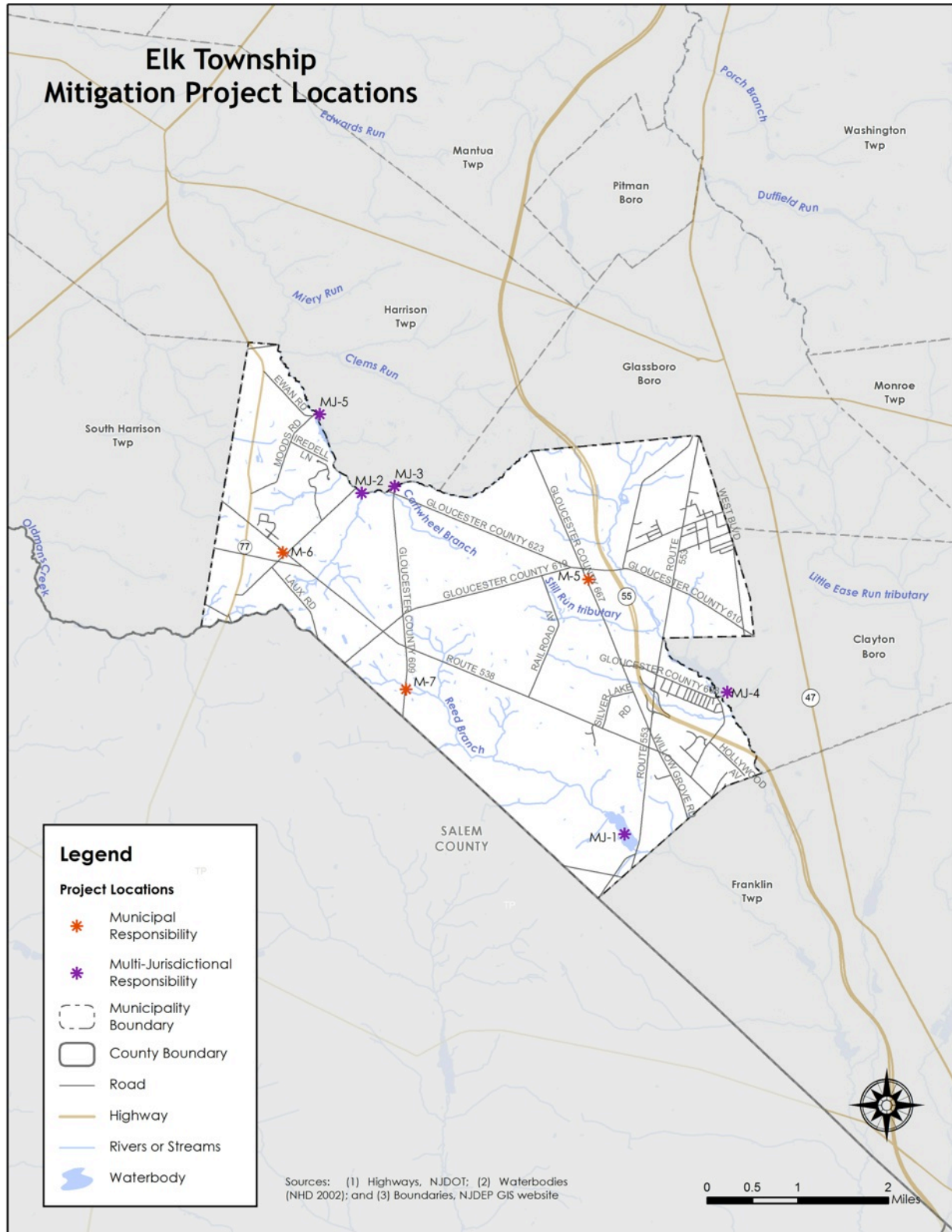
Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.5-4.

Table GC.5-13: Elk Township (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Determine current need and options for mitigation at Lake Garrison.	Dam Failure	Goal #4	Existing	Municipal OEM, Lake Garrison Association, County DPW, NJDEP.	Moderate
MJ-2	Determine current need and options for mitigation at Lake Gilman.	Dam Failure	Goal #4	Existing	Municipal OEM, Lake Gilman Association, County DPW, NJDEP.	Moderate
MJ-3	Risk assessment - Hackney Dam, 431 Richwood Road, County Road / Route 609.	Dam Failure	Goal #4	Existing	Municipal OEM, Harrison Township	Moderate
MJ-4	Risk assessment - dam on Silver Lake on Route 608.	Dam Failure	Goal #4	Existing	Municipal OEM, Clayton Borough	Moderate
MJ-5	Risk assessment - Ewan Lake Dam.	Dam Failure	Goal #4	Existing	Municipal OEM, Harrison Township	Moderate

Part 4: Mitigation Measures

Figure GC.5-4: Elk Township Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan (2013)
- Flood Damage Prevention Code ⁴
- Master Plan and Reexamination Reports (2009)
- Lake Garrison Emergency Action Plan (2010)
- Lake Hackney Emergency Action Plan (2014)
- Land Use and Zoning Code ⁵
- Stormwater Management Code ⁶
- Zoning Map (2010) ⁷

⁴ <http://ecode360.com/12497424>

⁵ <http://ecode360.com/12496838#12496838>

⁶ <http://ecode360.com/12498377>

⁷ http://www.elktownshipnj.gov/images/zoning_map.pdf

Attachment A: Public Review Comments

The following comments were received during the public review of the Elk Township Municipal Appendix:

Table GC.5.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Elk Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.6
Franklin Township, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.6-i
Part 1 Overview	GC.6-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.6-1
1.2: Franklin Township (Gloucester County) Municipal Appendix	GC.6-1
Part 2 Participation	GC.6-2
2.1: Municipal Working Group Participation	GC.6-2
2.2: Public Participation	GC.6-4
Part 3 Hazard Identification and Risk Assessment	GC.6-5
3.1: Municipal Profile	GC.6-5
3.2: Hazard Priorities	GC.6-9
3.3: Hazard Mapping	GC.6-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.6-11
Part 4 Mitigation Measures	GC.6-15
4.1: Mitigation Goals and Strategy	GC.6-15
4.2: SDVR HMP Mitigation Measures	GC.6-16
4.3: Municipal Mitigation Measures – Identification	GC.6-17
4.4: Municipal Mitigation Measures – Implementation	GC.6-19
4.5: Multi-Jurisdictional Mitigation Measures	GC.6-22
4.6: Plan Review and Integration	GC.6-24

Table of Contents

List of Figures

Figure GC.6-1: Franklin Township (Gloucester County) Location Map	GC.6-5
Figure GC.6-2: Franklin Township Base Map	GC.6-6
Figure GC.6-3: Franklin Township Housing Units by Year Built	GC.6-8
Figure GC.6-4: Franklin Township Mitigation Project Locations	GC.6-23

List of Tables

Table GC.6-1: Franklin Township (Gloucester County) Working Group	GC.6-2
Table GC.6-2: Public Participation	GC.6-4
Table GC.6-3: Franklin Township Demographics	GC.6-7
Table GC.6-4: Franklin Township Demographic Rankings	GC.6-7
Table GC.6-5: Franklin Township Economics and Housing	GC.6-7
Table GC.6-6: Franklin Township Ranking (Economics and Housing)	GC.6-8
Table GC.6-7: Supporting Mapping and Exhibits	GC.6-10
Table GC.6-8: Franklin Township Critical Facilities Inventory	GC.6-12
Table GC.6-9: Franklin Township Critical Facilities Hazard Exposure	GC.6-14
Table GC.6-10: Status of Franklin Township SDVR HMP Mitigation Measures	GC.6-16
Table GC.6-11: Franklin Township Municipal Mitigation Measures Identification	GC.6-18
Table GC.6-12: Franklin Township Municipal Mitigation Measures Implementation	GC.6-19
Table GC.6-13: Franklin Township Multi-Jurisdictional Mitigation Measures	GC.6-22

Attachments

Attachment GC.6.A: Public Review Comments	GC.6.A-1
Attachment GC.6.B: Adoption Resolution	GC.6.B-1
Attachment GC.6.C: Approval Letter	GC.6.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Franklin Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Franklin Township in Gloucester County, New Jersey.

The Franklin Township Municipal Working Group recommended the Franklin Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Franklin Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.6 -1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.6-1: Franklin Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Vincent	DiPietro	Franklin Township Police Department / Franklin Township Office of Emergency Management	Emergency Management Coordinator / Lieutenant of Police / Floodplain Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Debra	Fourre	Franklin Township Administration	Business Administrator		<input checked="" type="checkbox"/>	
Theodore	Wilkinson	Franklin Township Engineer	Township Engineer		<input checked="" type="checkbox"/>	
James	McKeever	Franklin Township Public Works	Superintendent		<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on July 28, 2014.

² Round 2 Work Session was held on October 15, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.6-1.

Part 2: Participation

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Land Use / Economic Development Planner
- Building Code Official
- Fire
- Emergency Medical Services
- Community / Faith-Based Organizations
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Business Associations
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Major employers and businesses
- Healthcare Institutions

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.6-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.6-2: Public Participation

Date	Type of Involvement	Location
September 22, 2014	Link to Project Website (http://nj4hmp.com) established	Franklin Township, Gloucester County: NJ4 HMP Project Website ⁵
November 13, 2014	Citizen Survey posted	Franklin Township, Gloucester County NJ ⁶
November 18, 2014	Preliminary Municipal Appendix posted to website for public comment	Franklin Township, Gloucester County NJ ⁷
December 9, 2014	Public hearing included on Franklin Township Committee agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Franklin Township Municipal Building
December 16, 2014	Press release regarding hazard mitigation and plan development issued	
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁸ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁹

⁵ <http://www.franklintownship.com/site/?s=mitigation>

⁶ <http://www.franklintownship.com/site/index.php/2014/11/18/citizen-survey/>

⁷ <http://www.franklintownship.com/site/>

⁸ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁹ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

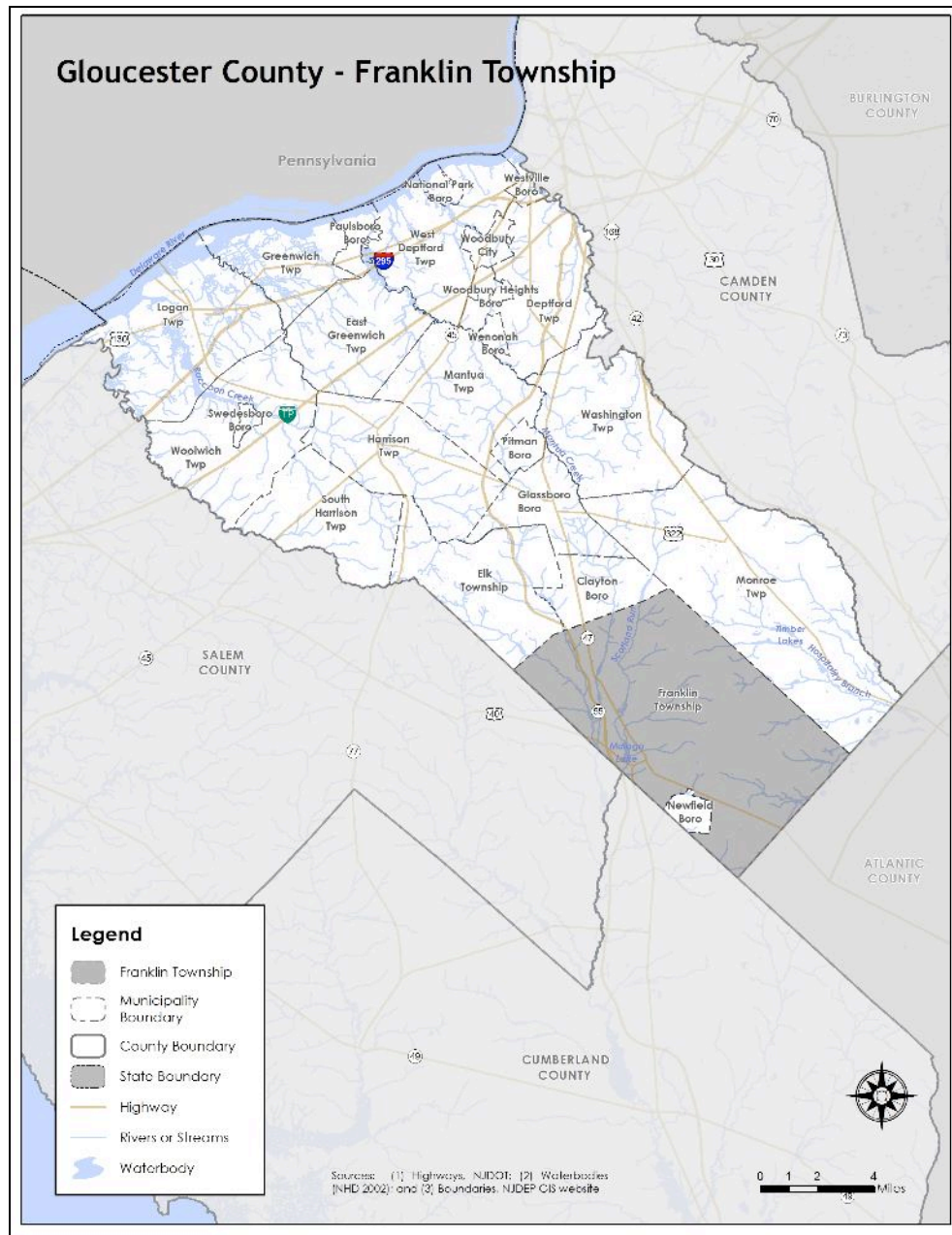
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Franklin Township is located in the southern corner of Gloucester County (See Figure GC.6-1).

Figure GC.6-1: Franklin Township (Gloucester County) Location Map

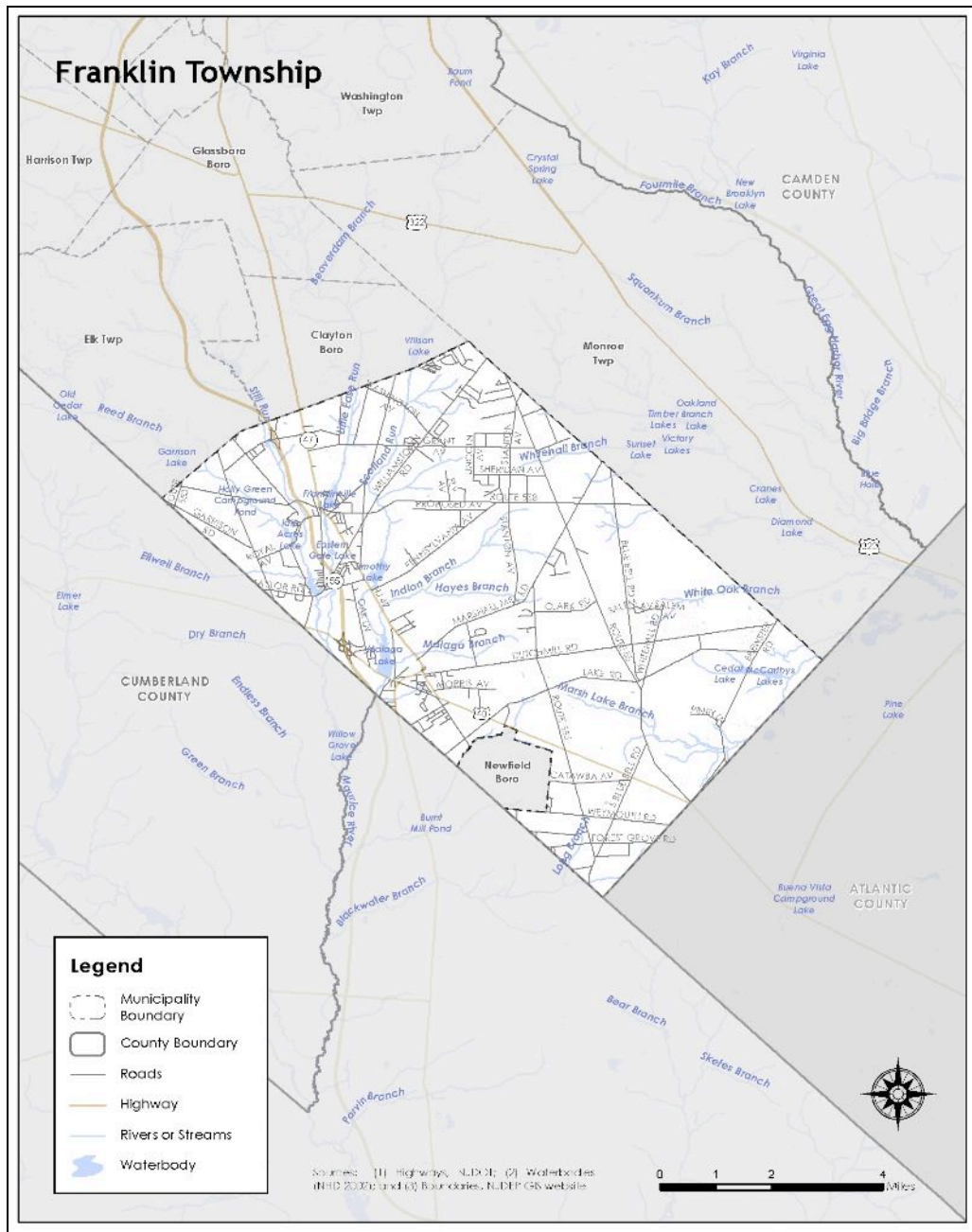


Part 3: Hazard Identification and Risk Assessment

Franklin Township is a growing community with a commitment to maintaining its natural environment. With a growing focus on Smart Growth practices within the community, Franklin Township continues to develop the area, while maintaining its rural and agricultural characteristics. Unincorporated communities include Franklinville, Malaga, Star Cross, Forrest Grove, and Janvier.

Per Figure GC.6-2, the major water courses include Scotland Run, Indian Branch, Franklinville Lake, Malaga Lake, Iona Lake, Idle Acres Lake, Timothy Lake, McCarthy Lake, and Cedar Lake. Major transportation routes include U.S. Highway 40 and State Highways 47 and 55. The land is predominantly flat and with large forested areas.

Figure GC.6-2: Franklin Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.6-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.6-3: Franklin Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Franklin Township	Gloucester County	Region	New Jersey
2000 Population	15,466	254,673	974,328	8,414,350
2010 Population	16,820	288,288	1,024,926	8,791,894
Percent Change	8.75%	13.2%	5.19%	4.49%
Population Density	300.9 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	55.91 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	24.0	24.4	24.1	23.5
% of Population 18 - 64	65.5	63.2	62.7	63
% of Population 65 and over	10.5	12.4	13.2	13.5

Table GC.6-4 illustrates how Franklin Township ranks in the county, the four county region, and New Jersey.

Table GC.6-4: Franklin Township Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	6	16	149
Land Area Rank	1	4	23
Population Density Rank	21	65	477
Population Change Rank	11	21	-

Table GC.6-5 includes information related to economic and housing statistics for Franklin Township, Gloucester County, the four county region, and New Jersey.

Table GC.6-5: Franklin Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Franklin Township	Gloucester County	Region	New Jersey
Date Incorporated	April 23, 1913	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$74,327	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	6,104	109,796	397,990	3,529,033
Occupied Housing Units	5,849	104,271	372,472	3,176,069
Vacant Housing Units	255	5,525	25,518	352,964
Owner Occupied Housing Units	5,239	83,525	266,593	2,126,279
Renter Occupied Housing Units	610	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Franklin Township	Gloucester County	Region	New Jersey
Building Permits	19	716	1,554	13,535
Largest Industry	Educational Services, health care and social assistance, and agriculture, forestry, fishing and hunting	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

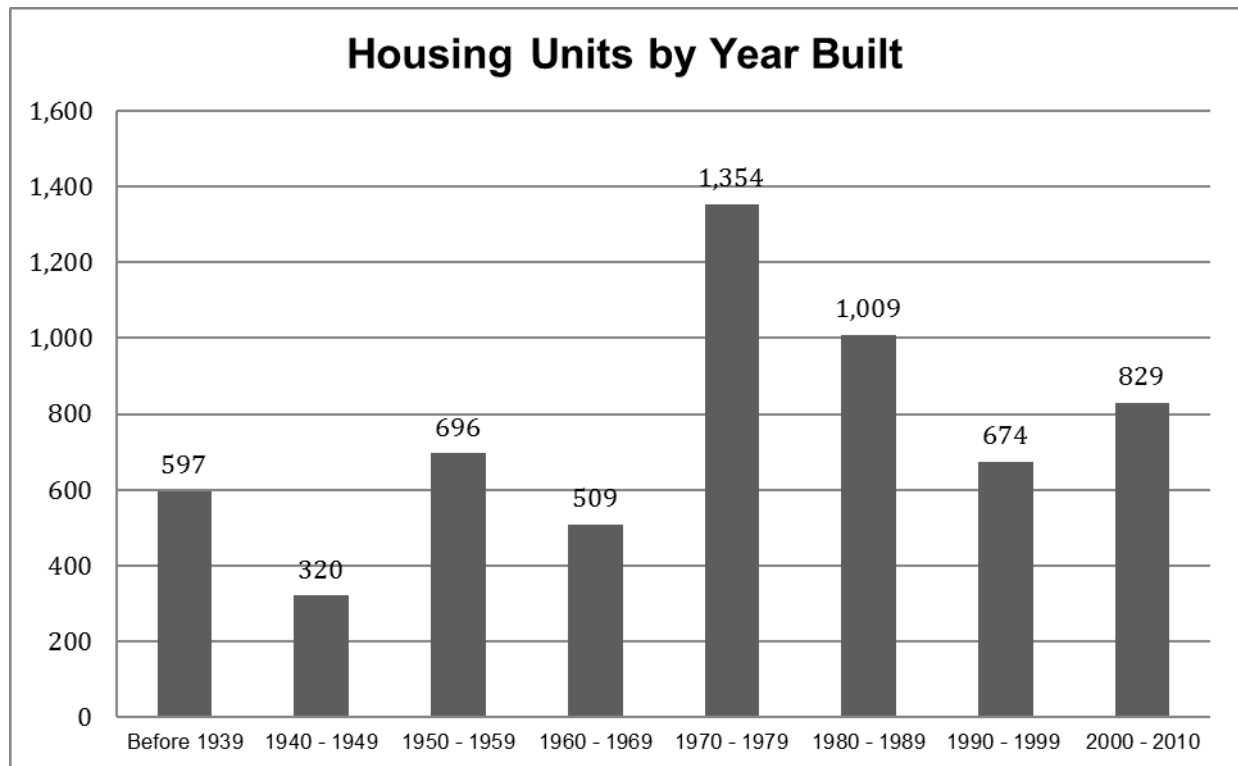
Table GC.6-6 illustrates how Franklin Township ranks in the county and the four county region.

Table GC.6-6: Franklin Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	10	21
Vacant Housing Rank	8	25
Renter Occupied Housing Rank	11	39
Building Permits	9	22

Figure GC.6-3 illustrates development patterns in Franklin Township by examining housing units by year built. About 22% of homes in Franklin Township were built during the 1970s.

Figure GC.6-3: Franklin Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Wildfire

Moderate Priority

- Dam Failure
- Flood
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Low Priority

- Drought
- Earthquake
- Extreme Temperature: Cold & Hot

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Levee Failure

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.6-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.6-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.6-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.6-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.6-8: Franklin Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Municipal Hall	Municipal	Administrative Offices	1571 Delsea Drive, Franklinville	CF-3	N	Y		M-5
CF-2	Emergency Operations Center	EOC	Co-located Facilities	118 Swedesboro Road, Franklinville	CF-6	N	Y ²		
CF-3	Police Station	Law Enforcement Facilities	Stations	1571 Delsea Drive, Franklinville	CF-1	N	Y	Includes holding cell	
CF-4	Malaga Fire Company	FireStation	Stations	604 West Main Street, Malaga		N	Y		
CF-5	Janvier Fire Company	FireStation	Stations	3438 Coles Mill Road, Franklinville		N	Y		
CF-6	Franklinville Fire Company	FireStation	Stations	118 Swedesboro Road, Franklinville	CF-2	N	Y		
CF-7	Forest Grove Fire Company	FireStation	Stations	1635 Forest Grove Road, Vineland		N	Y		
CF-8	Star Cross Fire Company	FireStation / EMS	Stations	4231 Tuckahoe Road, Williamstown		N	Y		
CF-9	EMS	EMS	Municipal Station	1672 Coles Mill Road, Franklinville		N	N		
CF-10	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	Public Works	234 Broad Street, Malaga		N	Y ³		M-6
CF-11	Our Lady Of Mercy Academy	Schools	Private Catholic School	1001 Main Road, Newfield		N	N		
CF-12	Main Road Elementary School	Schools	Public Schools	1452 Main Road, Newfield		N	N		

² There are two backup power generators at this location. One backup power generator supports the EOC (CF-2) and the other backup power generator supports the Franklinville Fire Company (CF-6).

³ Public Works Department maintains portable generators for the facility's use.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-13	Mary F. Janvier Elementary School	Schools	Public Schools	1532 Pennsylvania Avenue, Franklinville		N	N		
CF-14	Caroline L. Reutter Elementary School	Schools	Public Schools	2150 Delsea Drive, Franklinville		N	N		
CF-15	Delsea Regional Middle and High Schools ⁴	Schools	Public Schools	242 Fries Mill Road, Franklinville		Y	Y		M-14
CF-16	Community Center	Vulnerable Populations Facilities	Community Center	1584 Coles Mill Road, Franklinville		N	N		M-7
CF-17	Maryville Treatment Center	Health Care Facilities	Private Health Clinic / Treatment Centers	1903 Grant Avenue, Williamstown		N	Y		

⁴ High School and Middle School are two separate buildings.

Part 3: Hazard Identification and Risk Assessment

Table GC.6-9: Franklin Township (Gloucester County) Critical Facilities Hazard Exposure⁵

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Municipal Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-3	Police Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-4	Malaga Fire Company	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-5	Janvier Fire Company	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-6	Franklinville Fire Company	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-7	Forest Grove Fire Company	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-8	Star Cross Fire Company	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-9	EMS	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-10	Public Works	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-11	Our Lady Of Mercy Academy	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-12	Main Road Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-13	Mary F. Janvier Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-14	Caroline L. Reutter Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-15	Delsea Regional Middle and High Schools	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-16	Community Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-17	Maryville Treatment Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

⁵ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as initial risk reduction efforts
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures, to include repetitive flood loss properties
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.6-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.6-10.

Table GC.6-10: Status of Franklin Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Franklin 1: Engineering study to determine appropriate flood mitigation action for Police/ EOC center (municipality building) Located in floodplain area next to Sharon Lake on Delsea Drive.	Completed	Issue was resolved by moving the EOC to an alternate location. Additionally, mitigation measures have been taken to lower Sharon Lake. Therefore, a mitigation measure is not included in the updated Municipal Appendix.	N/A
Franklin 2: Acquisition or floodproofing of houses around Franklin Lake, Iona Lake, McCarty's Lake, and other developed and flood prone lakes in municipality.	Not completed, not funded.	Revised mitigation measure is included in updated Municipal Appendix.	M-13
Franklin 3: Modify building materials, revisit response and evacuation plans, fire lanes and education for populations in the Pinelands.	Not completed, not funded.	Revised mitigation measure is included in updated Municipal Appendix.	M-17
Franklin 4: Envelope hardening/secure roof ballast of shelter (Regional High School).	Work-in-progress	This project is being funded through Franklin Township School Board funds. The estimated date of completion is September, 2015.	M-14
Franklin 5: Engineering study to access risk and maintenance of Franklin Lake Dam, Iona Lake Dam, and McCarty's Lake Dam.	Not completed, not funded.	Revised mitigation measure is included in updated Municipal Appendix.	M-8

Table GC.6-10 Notes:

- A. See Tables GC.6-11 and GC.6-12 for municipal (M-#) mitigation measures
- B. See Table GC.6-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality

Table GC.6-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Table GC.6-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.6-4.

¹ See Section 3: Hazard Identification and Risk Assessment and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

Part 4: Mitigation Measures

Table GC.6-11: Franklin Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none"> • Current hazards and risks • Changing conditions and actions that may reduce / increase risk to include monitoring and maintenance of privately owned dams • Best practices for hazard mitigation at the individual or property level. 	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #3	Both
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #4	Both
M-5	Install permanent backup emergency power generator to Municipal Hall (CF-1).	All	Goal #4	Both
M-6	Install permanent backup emergency power generator to Public Works Facility (CF-10).	All	Goal #4	Both
M-7	Install permanent backup emergency power generator to Community Center (CF-16).	All	Goal #4	Both
M-8	Engineering study to assess risk and maintenance of Franklinville Lake Dam.	Flood	Goal #4	Existing
M-9	Upgrade drainage system on Lay Drive.	Flood	Goal #4	Both
M-10	Upgrade drainage and retention system on University Street.	Flood	Goal #4	Both
M-11	Upgrade drainage system on Sunny Hill Drive.	Flood	Goal #4	Both
M-12	Upgrade drainage system on Forrest Grove Road.	Flood	Goal #4	Both
M-13	Address identified Repetitive Flood Loss Properties.	Flood	Goal #4	Both
M-14	Envelope hardening/secure roof ballast of shelter (Regional High School) (CF-15).	High Wind	Goal #4	Both
M-15	Hazard threat assessment related to chlorine carrying freight rail carriers. ²	Hazardous Materials ³	Goal #4	Existing
M-16	Hazard threat assessment related to Arrow Crop Service Airport and hazardous materials on site.	Hazardous Materials ³	Goal #4	Existing
M-17	Modify building materials, revisit response and evacuation plans, fire lanes and education for populations in the Pinelands.	Wildfire	Goal #4	Both

² Freight rail carries pass behind apartment building of 40-50 families.

³ Although natural hazards are the focus of the NJ4 HMP, these technological hazards are a continuing concern to the community and are documented in the Municipal Appendix to reflect the full range of hazards within Franklin Township.

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures

Table GC.6-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria⁴
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁵
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.6-12: Franklin Township (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk to include monitoring and maintenance of privately owned dams	Municipal OEM	Moderate	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none">▪ Work with County Working Group to identify resource needs and availability.▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁵ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Public Works	High	Data Acquisition and Management and Engineering	Staff time commitment	On-going	Establish priorities, procedures, and reporting process for data collection.
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule. ⁶
M-5	Install permanent backup emergency power generator to Municipal Hall (CF-1).	Municipal OEM	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Install permanent backup emergency power generator to Public Works Facility (CF-10).	Municipal OEM	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-7	Install permanent backup emergency power generator to Community Center (CF-16).	Municipal OEM	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-8	Engineering study to access risk and maintenance of Franklinville Lake Dam.	Municipal OEM	Moderate	Private Property Flood Mitigation	\$50K	Three to five years	Conduct project scoping.
M-9	Upgrade drainage system on Lay Drive.	Municipal OEM	High	Private Property Flood Mitigation	\$100K – \$500K	One to three years	Conduct project scoping.
M-10	Upgrade drainage and retention system on University Street.	Municipal OEM	High	Public Property Flood Mitigation	< \$100K	One to three years	Conduct project scoping.
M-11	Upgrade drainage system on Sunny Hill Drive.	Municipal OEM	High	Private Property Flood Mitigation	< \$100K	One to three years	Conduct project scoping.
M-12	Upgrade drainage system on Forrest Grove Road.	Municipal OEM	Moderate	Private Property Flood Mitigation	< \$100K	Three to five years	Conduct project scoping.
M-13	Address identified Repetitive Flood Loss Properties.	Municipal OEM	High	Private Property Flood Mitigation	\$100K – \$1M	One to three years	Identify mitigation options including eligible activities per FEMA HMA programs.
M-14	Envelope hardening/secure roof ballast of shelter (Regional High School) (CF-15).	Municipal OEM	High	Building Retrofit	< \$100K	One to three years	Complete work-in-progress.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-15	Hazard threat assessment related to chlorine carrying freight rail carriers.	Municipal OEM	Moderate	Risk / Threat Assessment	< \$50K	Three to five years	Develop scope of work for risk / threat assessment and procure professional consulting services.
M-16	Hazard threat assessment related to Arrow Crop Service Airport and hazardous materials on site.	Municipal OEM	Moderate	Risk / Threat Assessment	< \$50K	Three to five years	Develop scope of work for risk / threat assessment and procure professional consulting services.
M-17	Modify building materials, revisit response and evacuation plans, fire lanes and education for populations in the Pinelands.	Municipal OEM and Fire Departments	Moderate	Public Property Flood Mitigation	< \$50K	One to three years	Conduct project scoping.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.6-13.

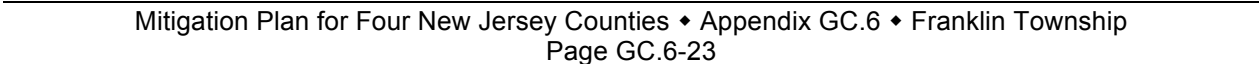
Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.6-4.

Table GC.6-13: Franklin Township (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Improve storm drainage on Morris Avenue at State Route 40 (evacuation route).	Flood	Goal #4	Existing	Municipal OEM, NJDOT	High
MJ-2	Alleviate flooding at West Boulevard & State Route 40.	Flood	Goal #4	Existing	Municipal OEM, NJDOT	Moderate



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan (2007)
- Floodplain Ordinance
- Master Plan (2004)
- Capital Improvement Budget (2014) ⁶
- Farmland Preservation Plan (2009)
- Open Space Recreation Plan (2002)
- Stormwater Ordinances ⁷

⁶ <http://www.franklintownship.com/site/wp-content/uploads/2014/03/R-56-14-Budget-Introduced.pdf>

⁷ <http://www.franklintownship.com/site/index.php/information/ordinances/>

Attachment A: Public Review Comments

The following comments were received during the public review of the Franklin Township Municipal Appendix:

Table GC.6.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Franklin Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.7
Glassboro Borough, New Jersey

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.7-i
Part 1 Overview	GC.7-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.7-1
1.2: Glassboro Borough (Gloucester County) Municipal Appendix	GC.7-1
Part 2 Participation	GC.7-2
2.1: Municipal Working Group Participation	GC.7-2
2.2: Public Participation	GC.7-5
Part 3 Hazard Identification and Risk Assessment	GC.7-6
3.1: Municipal Profile	GC.7-6
3.2: Hazard Priorities	GC.7-10
3.3: Hazard Mapping	GC.7-11
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.7-12
Part 4 Mitigation Measures	GC.7-18
4.1: Mitigation Goals and Strategy	GC.7-18
4.2: SDVR HMP Mitigation Measures	GC.7-19
4.3: Municipal Mitigation Measures – Identification	GC.7-20
4.4: Municipal Mitigation Measures – Implementation	GC.7-22
4.5: Multi-Jurisdictional Mitigation Measures	GC.7-24
4.6: Plan Review and Integration	GC.7-27

Table of Contents

List of Figures

Figure GC.7-1: Glassboro Borough (Gloucester County) Location Map	GC.7-6
Figure GC.7-2: Glassboro Borough Base Map	GC.7-7
Figure GC.7-3: Glassboro Borough Housing Units by Year Built	GC.7-9
Figure GC.7-4: Glassboro Borough Mitigation Project Locations	GC.7-26

List of Tables

Table GC.7-1: Glassboro Borough (Gloucester County) Working Group	GC.7-2
Table GC.7-2: Public Participation	GC.7-5
Table GC.7-3: Glassboro Borough Demographics	GC.7-8
Table GC.7-4: Glassboro Borough Demographic Rankings	GC.7-8
Table GC.7-5: Glassboro Borough Economics and Housing	GC.7-8
Table GC.7-6: Glassboro Borough Ranking (Economics and Housing)	GC.7-9
Table GC.7-7: Supporting Mapping and Exhibits	GC.7-11
Table GC.7-8: Glassboro Borough Critical Facilities Inventory	GC.7-13
Table GC.7-9: Glassboro Borough Critical Facilities Hazard Exposure	GC.7-16
Table GC.7-10: Status of Glassboro Borough SDVR HMP Mitigation Measures	GC.7-19
Table GC.7-11: Glassboro Borough Municipal Mitigation Measures Identification	GC.7-20
Table GC.7-12: Glassboro Borough Municipal Mitigation Measures Implementation	GC.7-22
Table GC.7-13: Glassboro Borough Multi-Jurisdictional Mitigation Measures	GC.7-24

Attachments

Attachment GC.7.A: Public Review Comments	GC.7.A-1
Attachment GC.7.B: Adoption Resolution	GC.7.B-1
Attachment GC.7.C: Approval Letter	GC.7.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Glassboro Borough (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Glassboro Borough in Gloucester County, New Jersey.

The Glassboro Borough Municipal Working Group recommended the Glassboro Borough (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Glassboro Borough Council adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.7-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.7-1: Glassboro Borough (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Working Group Meeting	Contribution ³
Jack	Manning	Glassboro Borough Police Department	Detective / OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Sean	Kelly	Glassboro Borough Fire Department	Fire Fighter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Participated in Rowan University Working Group Meetings.
Vernon	Howery	Glassboro Borough OEM	Deputy OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Joseph	Brigandi, Jr.	Glassboro Borough Administrator's Office	Borough Administrator			<input checked="" type="checkbox"/>	Met with OEM Coordinator for HMP Project updates.
Sharon L.	Nichols	Glassboro Borough Administrator's Office	Administrative Assistance to Borough Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Patricia	Frontino	Glassboro Borough Clerk's Office	Borough Clerk / Floodplain Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Karyn	Paccione	Glassboro Borough Revenue & Finance	CFO		<input checked="" type="checkbox"/>		
Lorraine	Penn	Glassboro Borough Parks & Recreation	Director		<input checked="" type="checkbox"/>		

¹ Round 1 Work Session was held on August 8, 2014.

² Round 2 Work Session was held on October 01, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.7-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Working Group Meeting	Contribution ³
Angelo	Martilini	Glassboro Borough Code Enforcement	Construction Code Official / Director of Code Enforcement, Planning & Zoning	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Raymond	DiClaudio	Glassboro Borough Health & Housing	Code Enforcement Office / Housing Inspector		<input checked="" type="checkbox"/>		
Salvatore	Fogarino	Glassboro Borough Construction Office	Housing Code Official	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Alex	Fanfarillo	Glassboro Borough Police Department	Chief of Police	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Steve	Smith	Glassboro Borough Fire Department	Fire Chief	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Drew	Sole	Glassboro Borough Public Schools	Supervisor of Buildings and Grounds	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Russell "Chip"	Clark J.	Glassboro Borough Water & Sewer	Superintendent	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Russell	Clark Sr.	Glassboro Borough Highway Department	Highway Superintendent	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Peter	Amico	Rowan University OEM	OEM Coordinator		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Coordinated / participated in Rowan University Working Group Meetings.

Part 2: Participation

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- GIS / IT Specialist
- Engineering
- Healthcare Institutions

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- Emergency Medical Services
- Business Associations
- Community / Faith-Based Organizations
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.7-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.7-2: Public Participation

Date	Type of Involvement	Location
August 29, 2014	Link to Project Website (http://nj4hmp.com) established	Glassboro Borough Office of Emergency Management ⁵
October 1, 2014	Information item included on Glassboro Borough Council Meeting agenda identifying opportunities for public participation	Glassboro Borough Hall
October 14, 2014	Flyers posted	Glassboro Borough Hall
October 14, 2014	Information item included on Glassboro Borough Council Meeting agenda identifying opportunities for public participation	Glassboro Borough Hall
October 11, 2014	Public outreach	Unity Day, Bullock School
November 8, 2014	Citizen Survey posted	Glassboro Borough Office of Emergency Management ⁵
November 18, 2014	Preliminary Municipal Appendix posted to website for public comment	The Borough of Glassboro ⁶
December 19, 2014	Public hearing included on Glassboro Borough Council agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Glassboro Borough Hall
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁷ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁸

⁵ <http://glassboroonline.com/public/office-of-emergency-management-oem/>

⁶ <http://glassboroonline.com/public/>

⁷ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁸ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

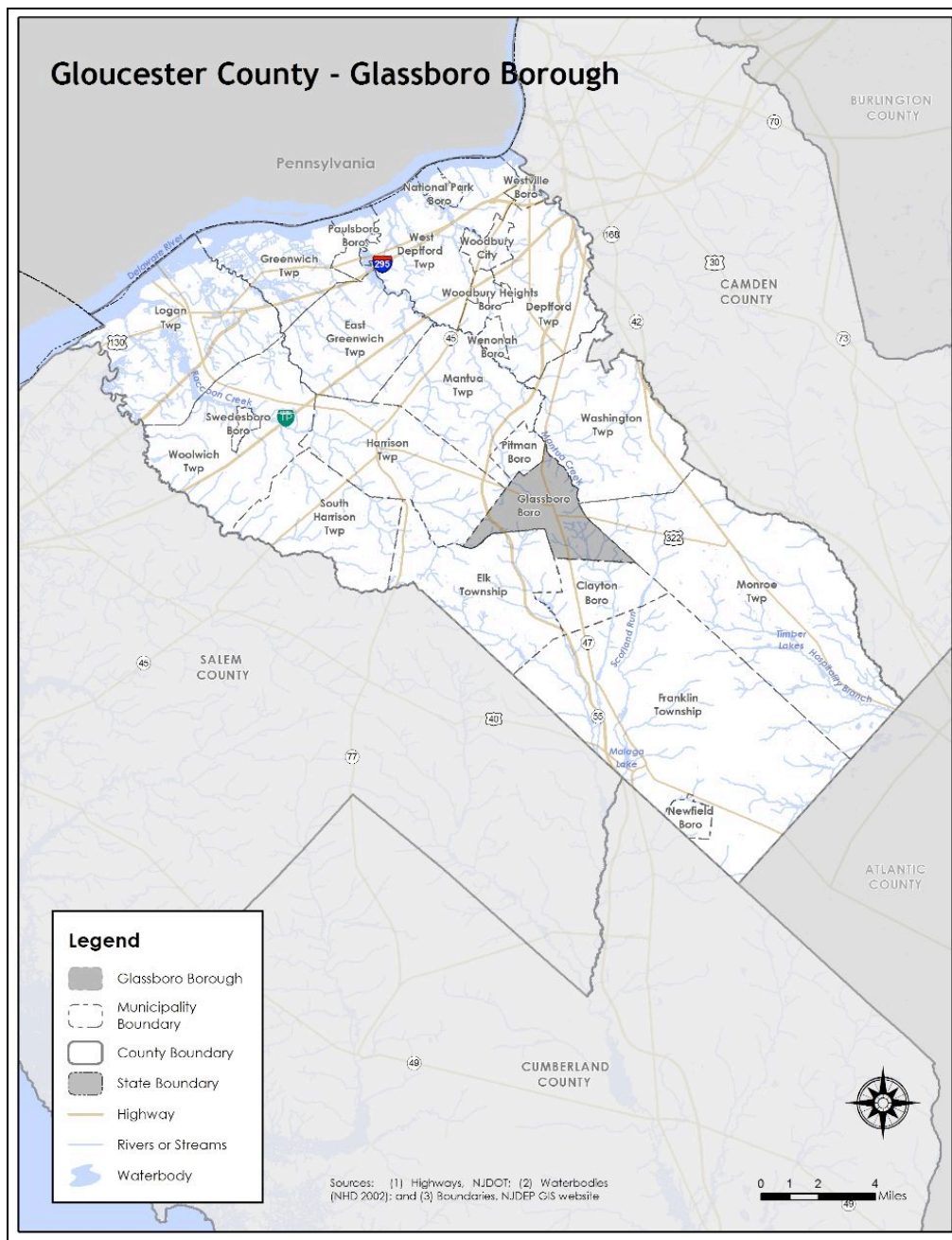
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Glassboro Borough is located in the central part of Gloucester County (See Figure GC.7-1).

Figure GC.7-1: Glassboro Borough (Gloucester County) Location Map

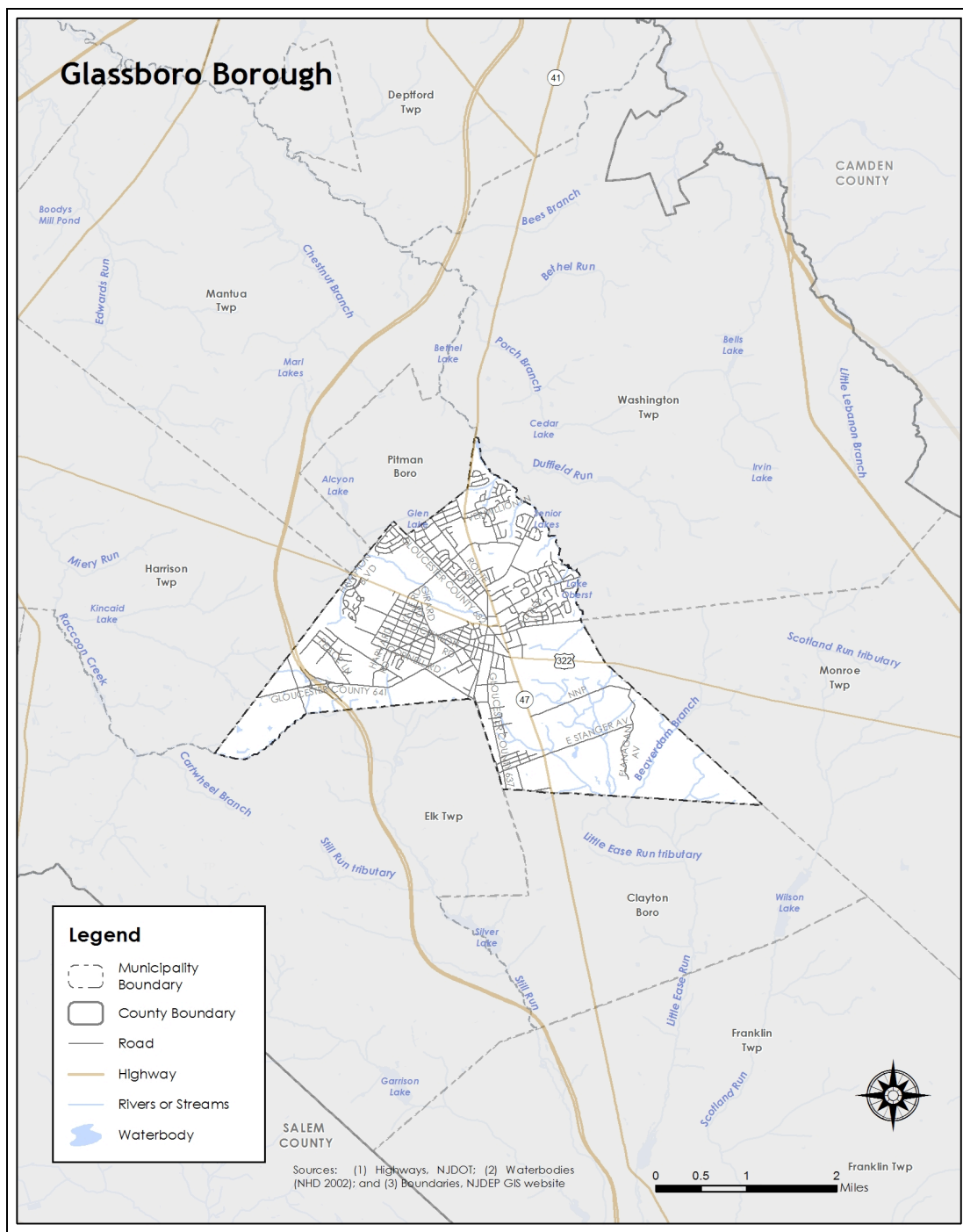


Part 3: Hazard Identification and Risk Assessment

Glassboro Borough is an urban community with growing industry and commercial centers. The Borough is also home to Rowan University.

Per Figure GC.7-2, the major water courses include Beaverdam Branch and Lake Oberst. Major transportation routes include U.S. Highway 322 and State Highway 47. The land is gently rolling with the southeastern part of the municipality covered by the Glassboro Fish and Wildlife Management Area.

Figure GC.7-2: Glassboro Borough Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.7-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.7-3: Glassboro Borough Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Glassboro Borough	Gloucester County	Region	New Jersey
2000 Population	19,068	254,673	974,328	8,414,350
2010 Population	18,579	288,288	1,024,926	8,791,894
Percent Change	-2.56%	13.2%	5.19%	4.49%
Population Density	2,023.9 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	9.18 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	19.4	24.4	24.1	23.5
% of Population 18 - 64	69.9	63.2	62.7	63
% of Population 65 and over	10.7	12.4	13.2	13.5

Table GC.7-4 illustrates how Glassboro Borough ranks in the county, the four county region, and New Jersey.

Table GC.7-4: Glassboro Borough Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	5	14	137
Land Area Rank	13	42	204
Population Density Rank	10	44	291
Population Change Rank	20	67	-

Table GC.7-5 includes information related to economic and housing statistics for Glassboro Borough, Gloucester County, the four county region, and New Jersey.

Table GC.7-5: Glassboro Borough Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Glassboro Borough	Gloucester County	Region	New Jersey
Date Incorporated	March 11, 1878	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$54,795	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	6,590	109,796	397,990	3,529,033
Occupied Housing Units	6,158	104,271	372,472	3,176,069
Vacant Housing Units	432	5,525	25,518	352,964
Owner Occupied Housing Units	4,019	83,525	266,593	2,126,279
Renter occupied Housing Units	2,139	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Glassboro Borough	Gloucester County	Region	New Jersey
Building Permits	113	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

A major employer in the municipality is Rowan University.

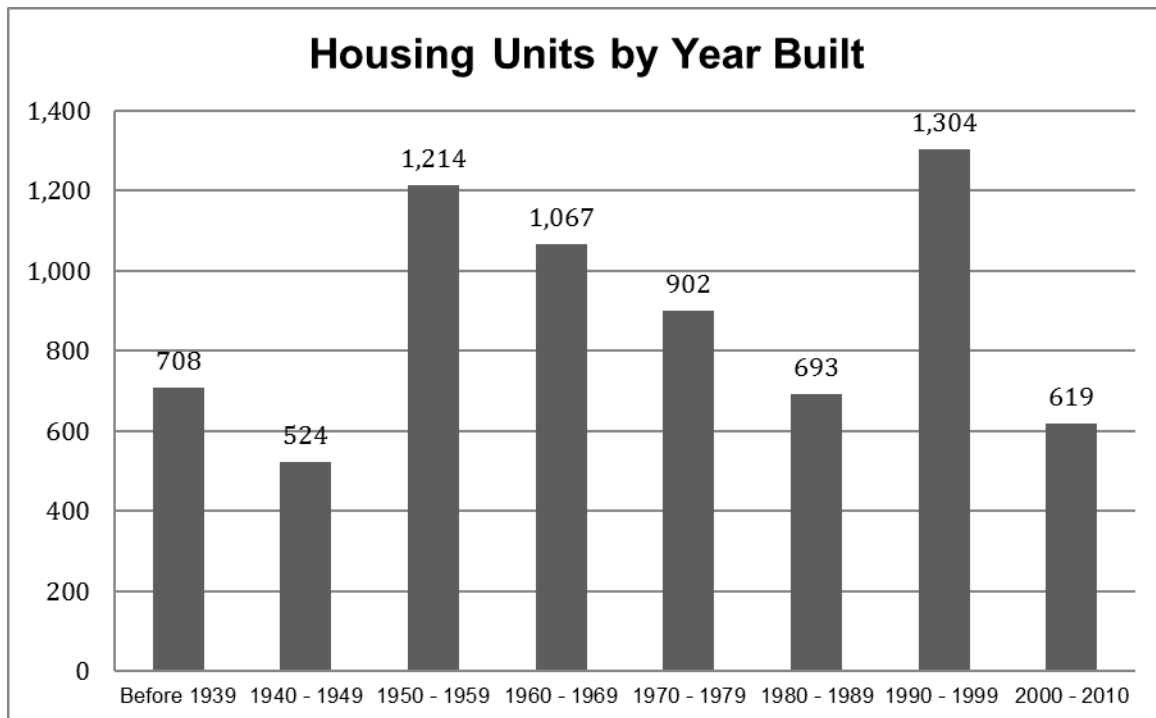
Table GC.7-6 illustrates how Glassboro Borough ranks in the county and the four county region.

Table GC.7-6: Glassboro Borough Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	22	67
Vacant Housing Rank	5	19
Renter Occupied Housing Rank	4	15
Building Permits Rank	2	3

Figure GC.7-3 illustrates development patterns in Glassboro Borough by examining housing units by year built. Nearly one in five homes in Glassboro Borough was built during the 1990s.

Figure GC.7-3: Glassboro Borough Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Dam Failure
- Flood
- High Wind

Moderate Priority

- Earthquake
- Extreme Temperature: Cold & Hot
- Wildfire

Low Priority

- Drought
- Severe Weather – Summer
- Severe Weather – Winter

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Levee Failure

¹ See *Section 3: Hazard Identification and Risk Assessment*.

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.7-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.7-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.7-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.7-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.7-8: Glassboro Borough (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Borough Hall	Municipal	Administrative Office	1 South Main Street, Glassboro		N	Y		
CF-2	Emergency Operations Center	EOC	Co-located Facility	1 South Main Street, Glassboro	CF-1	N	Y		
CF-3	Police Station	Law Enforcement Facilities	Stations	1 South Main Street, Glassboro	CF-1	N	Y	Includes a holding cell	
CF-4	Glassboro Fire Department - Station 26-1	FireStation	Stations	27 East High Street, Glassboro		N	Y		M-5
CF-5	Rowan University EMS	EMS	Municipal Stations	201 Mullica Hill Road, Glassboro		N	Y		
CF-6	Public Works	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	125 Grove Street, Glassboro		N	Y ²		
CF-7	Construction Office	Public Works	Administrative Offices	10 South Poplar, Glassboro		N	N		
CF-8	Delsea Drive Treatment Plant	Utilities – Wastewater	Treatment Plant	227 South Delsea Drive, Glassboro		N/A	Y		
CF-9	Ellis Street Lift Station	Utilities – Wastewater	Treatment Plant	737 Ellis Street, Glassboro		N/A	Y		
CF-10	Park Avenue Lift Station	Utilities – Wastewater	Treatment Plant	2 Park Avenue, Glassboro		N/A	Y		
CF-11	East Stanger Avenue Lift Station	Utilities – Wastewater	Treatment Plant	231 East Stanger Avenue, Glassboro		N/A	Y		
CF-12	Well #2	Utilities – Water	Wellheads	353 North Main Street, Glassboro		N/A	N		M-6
CF-13	Well # 3	Utilities – Water	Wellheads	607 Maryland Avenue, Glassboro		N/A			

² Back-up generator provides partial building coverage for emergency lighting.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-14	Well #4	Utilities – Water	Wellheads	9 Donald Barger Boulevard, Glassboro		N/A	N		M-7
CF-15	Well #5 / Treatment Plant	Utilities – Water	Combined wellheads / treatment center	15 Carl Street, Glassboro		N/A	Y		
CF-16	Well #6 / #7	Utilities – Water	Wellheads	216 South Delsea Drive, Glassboro		N/A	Y		
CF-17	Well #8	Utilities – Water	Wellheads	1704 Mallard Street, Glassboro		N/A	Y		
CF-18	Well #9	Utilities – Water	Wellheads	1506 Mallard Street, Glassboro		N/A	Y		
CF-19	Water and Sewer Office	Utilities – Water & Sewer	Administrative Offices	227 South Delsea Drive, Glassboro		N/A	N	Includes Public Works Garage	
CF-20	Greentree Water Tower	Utilities – Water	Water Towers	240 Greentree Road, Glassboro		N/A	N		
CF-21	College Water Tower	Utilities – Water	Water Towers	No Street Address, Glassboro		N/A	N		
CF-22	Fern Water Tower	Utilities – Water	Water Towers	410 Fern Road, Glassboro		N/A	N		
CF-23	Ambassador Christian Academy	Schools	Private Schools	535 Mullica Hill Road, Glassboro		Y	N		
CF-24	J. Harvey Rodgers School	Schools	Public Schools	300 Dickinson Road, Glassboro		Y	N		M-8
CF-25	Thomas E. Bowe Elementary School	Schools	Public Schools	7 Mancuso Lane, Glassboro		N	Y ²		M-9
CF-26	Dorothy L. Bullock School	Schools	Public Schools	370 East New Street, Glassboro		Y	Y ²		M-10
CF-27	Glassboro Intermediate School	Schools	Public Schools	202 North Delsea Drive, Glassboro		N	Y ²		M-11
CF-28	Glassboro High School and George Beach Jr. Administration Building	Schools	Combined Public School Administrative Office / School	560 Joseph L. Bowe Boulevard, Glassboro		N	Y ²		M-12

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-29	Post House	Vulnerable Population - Group Home	Private Assisted Living	540 Mullica Hill Road, Glassboro		N ³	Y		
CF-30	MSAA Manor Apartments	Vulnerable Population - Group Home	Private / Non-Profit Group Homes	20 South Main Street, Glassboro		N ³	N		
CF-31	Wedgewood America Senior Housing	Vulnerable Population - Group Home	Private / Non-Profit Group Homes	120 South Delsea Drive, Glassboro		N ³	N		
CF-32	Senior Citizen Center	Vulnerable Population - Senior Center	Senior Center	152 South Delsea Drive, Glassboro		Y	N		M-13
CF-33	Inspira Urgent Care	Healthcare Facility	Private Health Clinic / Treatment Centers	1120 North Delsea Drive, Glassboro		N	Y		

³ Shelter-in-place.

Part 3: Hazard Identification and Risk Assessment

Table GC.7-9: Glassboro Borough (Gloucester County) Critical Facilities Hazard Exposure⁴

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Borough Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-3	Police Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-4	Fire Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-5	EMS	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-6	Public Works	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-7	Construction Office	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-8	Delsea Drive Treatment Plant	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-9	Ellis Street Lift Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-10	Park Avenue Lift Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-11	East Stanger Avenue Lift Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-12	Well #2	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-13	Well # 3	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-14	Well #4	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-15	Well #5 / Treatment Plant	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-16	Well #6 / #7	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-17	Well #8	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-18	Well #9	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-19	Water and Sewer Office	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-20	Greentree Water Tower	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-21	College Water Tower	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

⁴ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-22	Fern Water Tower	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-23	Ambassador Christian Academy	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-24	J. Harvey Rodgers School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-25	Thomas E. Bowe Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-26	Dorothy L. Bullock School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-27	Glassboro Intermediate School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-28	Glassboro High School and George Beach Jr. Administration Building	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-29	Post House	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-30	MSAA Manor Apartments	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-31	Wedgewood America Senior Housing	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-32	Senior Citizen Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-33	Inspira Urgent Care	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as initial risk reduction efforts
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures, to include private dam monitoring and maintenance measures
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.7-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.7-10.

Table GC.7-10: Status of Glassboro Borough (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Glassboro 1: Engineering study to determine drainage/conveyance on Union Street.	Not completed, not funded	Mitigation measure is included in updated Municipal Appendix.	M-14
Glassboro 2: Engineering study to determine flood mitigation action for Police Department.	Completed.	Issue was resolved through capital improvement funding mechanisms. Therefore, a mitigation measure is not included in the updated Municipal Appendix.	N/A
Glassboro 3: Critical facilities protection/ hazard threat recognition of hazmat (high pressure lines) running along Union Street, Ellis Street, and Delsea Drive.	Not completed, not funded	Revised mitigation measure included in updated Municipal Appendix.	MJ-8

Table GC.7-10 Notes:

- A. See Tables GC.7-11 and GC.7-12 for municipal (M-#) mitigation measures
- B. See Table GC.7-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality

Table GC.7-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Note: Glassboro Borough does not currently have RL or SRL properties per information provided by the New Jersey Department of Environmental Protection.

Table GC.7-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.7-4.

Table GC.7-11: Glassboro Borough (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk to include monitoring and maintenance of privately owned dams• Best practices for hazard mitigation at the individual or property level.	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #3	Both
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #4	Both

¹ See Section 3: Hazard Identification and Risk Assessment and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-5	Install permanent backup emergency power generator at Glassboro Fire Department – Station 26-1 (CF-4).	All	Goal #4	Existing
M-6	Install permanent backup emergency power generator at Well #2 (CF-12).	All	Goal #4	Existing
M-7	Install permanent backup emergency power generator with diesel engine for well operation at Well #4 (CF-14).	All	Goal #4	Existing
M-8	Install permanent backup emergency power generator at J. Harvey Rogers School (CF-24).	All	Goal #4	Existing
M-9	Install permanent backup emergency power generator at Thomas E. Bowe Elementary School (CF-25).	All	Goal #4	Existing
M-10	Install permanent backup emergency power generator at Dorothy L. Bullock School (CF-26).	All	Goal #4	Existing
M-11	Install permanent backup emergency power generator at Glassboro Intermediate School (CF-27).	All	Goal #4	Existing
M-12	Install permanent backup emergency power generator at Administration Building (CF-28).	All	Goal #4	Both
M-13	Install permanent backup emergency power generator at Senior Center (CF-32).	All	Goal #4	Both
M-14	Engineering study to determine drainage / conveyance on Union Street.	Flood	Goal #4	Existing
M-15	Pipe upgrade on East Boulevard.	Flood	Goal #4	Existing
M-16	Engineering study to determine high water level at Isabella Drive.	Flood	Goal #4	Existing

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures

Table GC.7-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria²
- Project Type to help determine funding options and implementation mechanisms at the municipal level³
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.7-12: Glassboro Borough (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	High	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Public Works	High	Data Acquisition and Management	Staff time commitment	On-going	Establish priorities, procedures, and reporting process for data collection.
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.

² See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

³ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Install permanent backup emergency power generator at Glassboro Fire Department – Station 26-1 (CF-4).	Municipal OEM and Public Works	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Install permanent backup emergency power generator at Well #2 (CF-12).	Municipal OEM and Public Works Department	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Accept bid, purchase and install generator.
M-7	Install permanent backup emergency power generator at Well #4 (CF-14).	Municipal OEM and Public Works Department	Moderate	Back-up Emergency Power Generator	\$100K - \$500K	Three to five years	Accept bid, purchase and install generator.
M-8	Install permanent backup emergency power generator at J. Harvey Rogers School (CF-24).	Municipal OEM and Board of Education	High	Back-up Emergency Power Generator	\$100K - \$500K	Three to five years	Conduct project scoping.
M-9	Install permanent backup emergency power generator at Thomas E. Bowe Elementary School (CF-25).	Municipal OEM and Board of Education	High	Back-up Emergency Power Generator	\$100K - \$500K	Three to five years	Conduct project scoping.
M-10	Install permanent backup emergency power generator at Dorothy L. Bullock School (CF-26).	Municipal OEM and Board of Education	High	Back-up Emergency Power Generator	\$100K - \$500K	Three to five years	Conduct project scoping.
M-11	Install permanent backup emergency power generator at Glassboro Intermediate School (CF-27).	Municipal OEM and Board of Education	High	Back-up Emergency Power Generator	\$100K - \$500K	Three to five years	Conduct project scoping.
M-12	Install permanent backup emergency power generator at Administration Building (CF-28).	Municipal OEM and Board of Education	High	Back-up Emergency Power Generator	\$100K - \$500K	Three to five years	Conduct project scoping.
M-13	Install permanent backup emergency power generator at Senior Center (CF-32).	Municipal OEM and Board of Education	High	Back-up Emergency Power Generator	\$100K - \$500K	Three to five years	Conduct project scoping.
M-14	Engineering study to determine drainage / conveyance on Union Street.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	\$100K – \$500K	One to three years	Conduct project scoping.
M-15	Pipe upgrade on East Boulevard.	Municipal OEM and Public Works Department	Moderate	Public Property Flood Mitigation	< \$100K	Three to five years	Conduct project scoping.
M-16	Engineering study to determine high water level at Isabella Drive.	Municipal OEM and Public Works Department	Moderate	Private Property Flood Mitigation	< \$100K	Three to five years	Conduct project scoping.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.7-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.7-4.

Table GC.7-13: Glassboro Borough (Gloucester County) Multi-Jurisdictional Mitigation Measures⁴

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Determine status of Oberst Dam for Lake Oberst.	Dam Failure	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-2	Improve storm drainage at South Academy Street between Grillo Street and Grove Street.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DWP, NJDOT	High
MJ-3	Determine effectiveness of work-in-progress on detention basin at Rowan Boulevard.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW, and NJ DEP	High

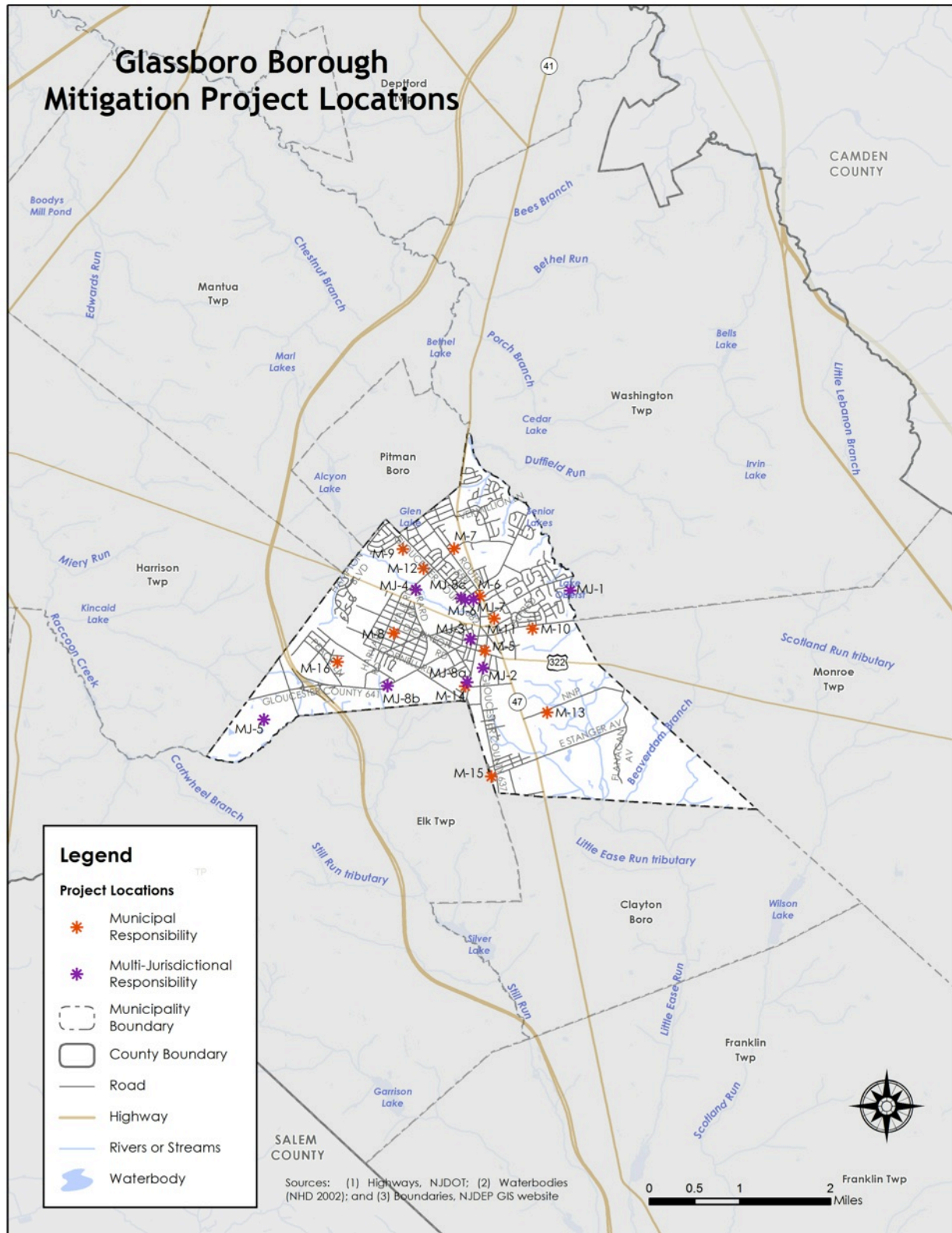
⁴ Refer to Rowan University's Appendix for additional multi-jurisdictional mitigation measures that impact and involve Glassboro Borough Municipal OEM and other select departments.

Part 4: Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-4	Alleviate flooding at Chestnut Branch Drive on Rowan University Campus.	Flood	Goal #4	Both	Municipal OEM, Rowan University, Gloucester County DPW	High
MJ-5	Alleviate flooding at Village Grande and Camelot Avenue.	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW	High
MJ-6	Improve storm drainage at Carpenter Street and Normal Boulevard.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	High
MJ-7	Improve drainage around Campus Terrace Apartments on Carpenter Street.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	High
MJ-8	Hazard threat assessment related to South Jersey Gas high pressure lines running along Union Street, Ellis Street, and Delsea Drive.	Hazardous Materials	Goal #4	Both	Municipal OEM and South Jersey Gas	Moderate

Part 4: Mitigation Measures

Figure GC.7-4: Glassboro Borough Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan (2014)
- Floodplain Ordinance
- Master Plan (2004)
- Land Use and Development Ordinances⁵
- Capital Improvement Budget (2014)⁶

⁵ <http://Glassboronj.com/public/borough-ordinances/>

⁶ <http://108.174.148.114/~Glassboro4/public/wp-content/uploads/2014/04/Glassboro2014BudgetadoptedApril242014.pdf>

Attachment A: Public Review Comments

The following comments were received during the public review of the Glassboro Borough Municipal Appendix:

Table GC.7.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Glassboro Borough Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.8
Greenwich Township, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.8-i
Part 1 Overview	GC.8-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.8-1
1.2: Greenwich Township (Gloucester County) Municipal Appendix	GC.8-1
Part 2 Participation	GC.8-2
2.1: Municipal Working Group Participation	GC.8-2
2.2: Public Participation	GC.8-4
Part 3 Hazard Identification and Risk Assessment	GC.8-5
3.1: Municipal Profile	GC.8-5
3.2: Hazard Priorities	GC.8-9
3.3: Hazard Mapping	GC.8-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.8-11
Part 4 Mitigation Measures	GC.8-16
4.1: Mitigation Goals and Strategy	GC.8-16
4.2: SDVR HMP Mitigation Measures	GC.8-17
4.3: Municipal Mitigation Measures – Identification	GC.8-18
4.4: Municipal Mitigation Measures – Implementation	GC.8-20
4.5: Multi-Jurisdictional Mitigation Measures	GC.8-23
4.6: Plan Review and Integration	GC.8-25

Table of Contents

List of Figures

Figure GC.8-1: Greenwich Township (Gloucester County) Location Map	GC.8-5
Figure GC.8-2: Greenwich Township Base Map	GC.8-6
Figure GC.8-3: Greenwich Township Housing Units by Year Built	GC.8-8
Figure GC.8-4: Greenwich Township Mitigation Project Locations	GC.8-24

List of Tables

Table GC.8-1: Greenwich Township (Gloucester County) Working Group	GC.8-2
Table GC.8-2: Public Participation	GC.8-4
Table GC.8-3: Greenwich Township Demographics	GC.8-7
Table GC.8-4: Greenwich Township Demographic Rankings	GC.8-7
Table GC.8-5: Greenwich Township Economics and Housing	GC.8-7
Table GC.8-6: Greenwich Township Ranking (Economics and Housing)	GC.8-8
Table GC.8-7: Supporting Mapping and Exhibits	GC.8-10
Table GC.8-8: Greenwich Township Critical Facilities Inventory	GC.8-12
Table GC.8-9: Greenwich Township Critical Facilities Hazard Exposure	GC.8-14
Table GC.8-10: Status of Greenwich Township SDVR HMP Mitigation Measures	GC.8-17
Table GC.8-11: Greenwich Township Municipal Mitigation Measures Identification	GC.8-18
Table GC.8-12: Greenwich Township Municipal Mitigation Measures Implementation	GC.8-20
Table GC.8-13: Greenwich Township Multi-Jurisdictional Mitigation Measures	GC.8-23

Attachments

Attachment GC.8.A: Public Review Comments	GC.8.A-1
Attachment GC.8.B: Adoption Resolution	GC.8.B-1
Attachment GC.8.C: Approval Letter	GC.8.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Greenwich Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Greenwich Township in Gloucester County, New Jersey.

The Greenwich Township Municipal Working Group recommended the Greenwich Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Greenwich Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.8-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.8-1: Greenwich Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Albert	Silbaugh	Greenwich Township OEM	OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions and provided relevant municipal documents.
Joan	Silbaugh	Greenwich Township OEM	Deputy OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Robert	Schoch	Greenwich Township OEM / Greenwich Township Public Works	Deputy OEM Coordinator / Public Works Supervisor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
George	Shivery Jr.	Greenwich Township Administration / Greenwich Township Public Safety	Mayor / Director Public Safety	<input checked="" type="checkbox"/>		
Theodore	Pohlig	Greenwich Township Construction Office	Floodplain Administrator	<input checked="" type="checkbox"/>		

¹ Round 1 Work Session was held on June 30, 2014.

² Round 2 Work Session was held on August 25, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.8-1.

Part 2: Participation

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Land Use / Economic Development Planner
- Building Code Official
- Engineering
- Police
- Fire
- Emergency Medical Services
- Community / Faith-Based Organizations
- Major Employers and Businesses
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Business Associations
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Healthcare Institutions

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.8-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.8-2: Public Participation

Date	Type of Involvement	Location
August 15, 2014	Link to Project Website (http://nj4hmp.com) established	Township of Greenwich Gloucester County NJ, Emergency Management ⁵
July 15, 2014	Flyers posted	Greenwich Township Municipal Building / Greenwich Township Library / Greenwich Township Public Works Building
November 10, 2014	Information item included on East Greenwich Township Committee agenda identifying opportunities for public participation	Gibbstown Fire House
November 17, 2014	Public meeting with presentation and open discussion	Township Court Building
November 18, 2014	Preliminary Municipal Appendix posted to website for public comment	Township of Greenwich Gloucester County NJ, Emergency Management ⁵
November 24, 2014	Public outreach	Senior Citizens Club Meeting
November 25, 2014	Citizen Survey posted	Township of Greenwich Gloucester County NJ, Emergency Management ⁵
December 15, 2014	Public hearing included on Greenwich Township Committee agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Township Court Building
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix was included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁶ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁷

⁵ <http://www.greenwich-twp.com/EMERG.html>

⁶ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁷ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

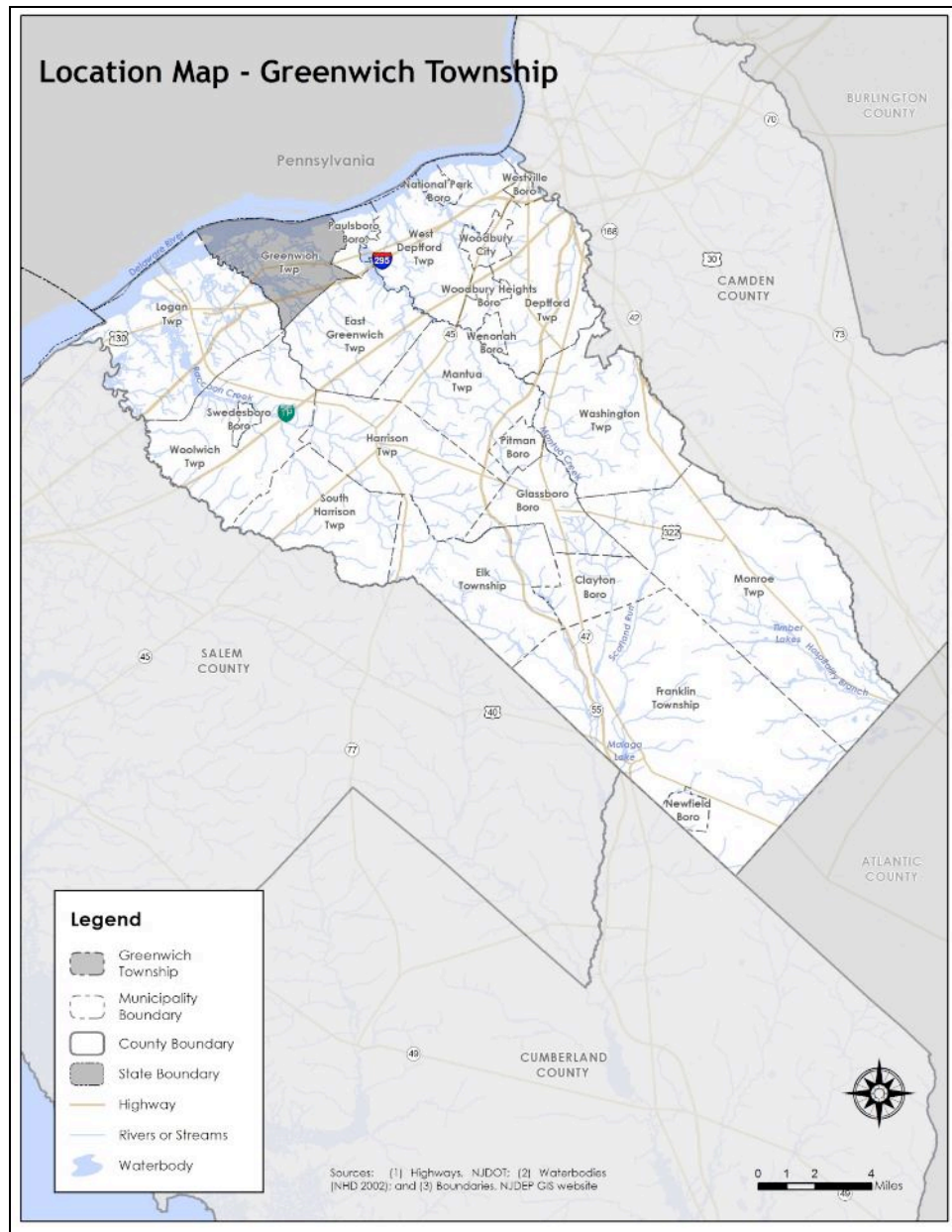
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Greenwich Township is located on the northern edge of Gloucester County (See Figure GC.8-1).

Figure GC.8-1: Greenwich Township (Gloucester County) Location Map

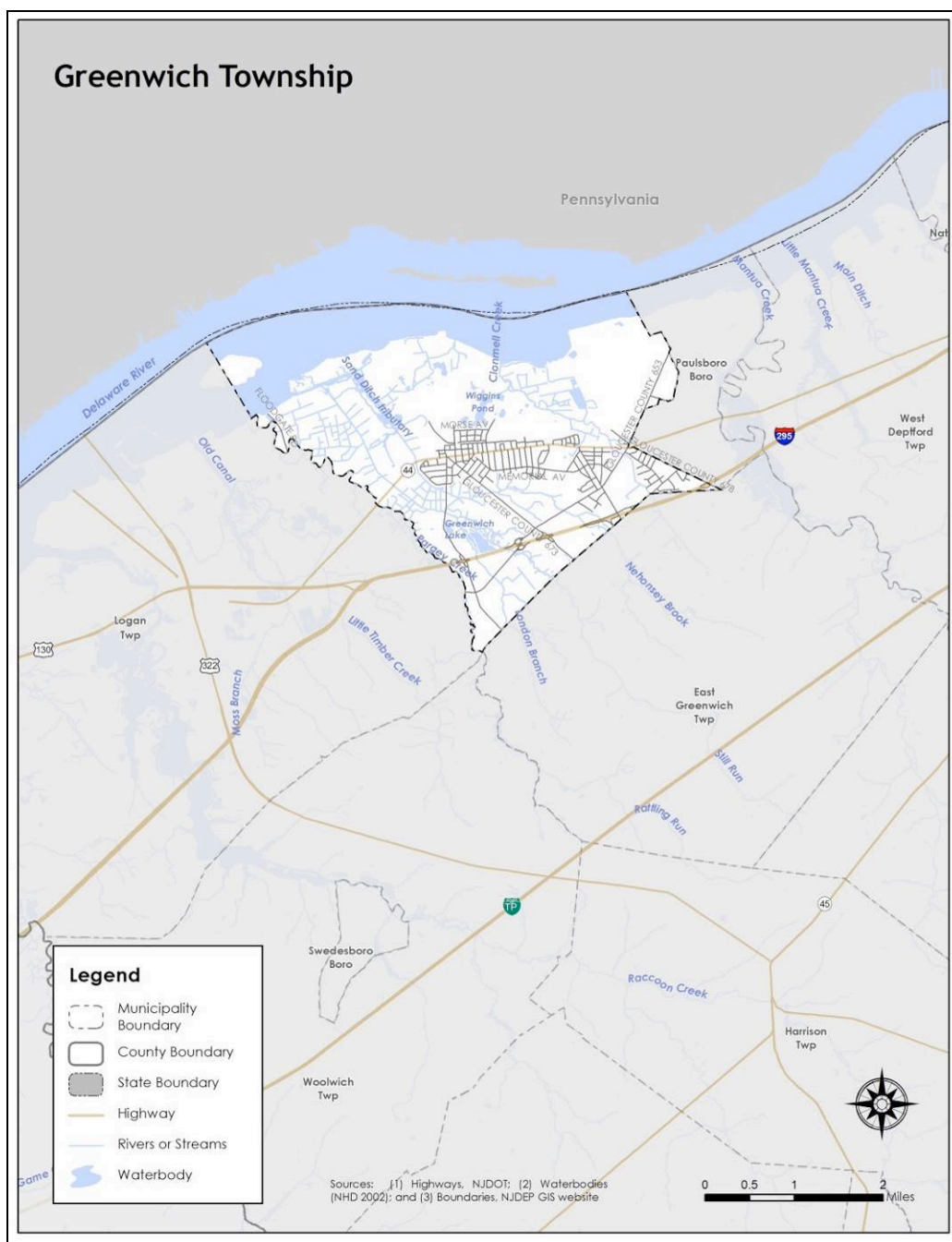


Part 3: Hazard Identification and Risk Assessment

Greenwich Township is a rural residential community based on the Delaware River. The Township includes one census-designated place and unincorporated community called Gibbstown.

Per Figure GC.8-2, major water bodies include the Delaware River and Repaupo Creek, which form the northern and western borders of the municipality respectively, and Greenwich Lake. Major transportation routes include Interstate 295 and State Highway Route 44. The land is generally flat leading to the Delaware River.

Figure GC.8-2: Greenwich Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.8-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.8-3: Greenwich Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Greenwich Township	Gloucester County	Region	New Jersey
2000 Population	4,879	254,673	974,328	8,414,350
2010 Population	4,899	288,288	1,024,926	8,791,894
Percent Change	0.41%	13.2%	5.19%	4.49%
Population Density	546.2 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	8.97 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population under 18 years	20.9	24.4	24.1	23.5
% of Population 18 – 64	61.1	63.2	62.7	63
% of Population 65 and older	18.0	12.4	13.2	13.5

Table GC.8-4 illustrates how Greenwich Township ranks in the county, the four county region, and New Jersey.

Table GC.8-4: Greenwich Township Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	State (total of 565)
Population Rank	16	51	380
Land Area Rank	14	43	208
Population Density Rank	19	61	437
Population Change Rank	15	49	-

Table GC.8-5 includes information related to economic and housing statistics for Greenwich Township, Gloucester County, the four county region, and New Jersey.

Table GC.8-5: Greenwich Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Greenwich Township	Gloucester County	Region	New Jersey
Date Incorporated	February 21, 1798	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$63,817	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	2,048	109,796	397,990	3,529,033
Occupied Housing Units	1,946	104,271	372,472	3,176,069
Vacant Housing Units	102	5,525	25,518	352,964
Owner Occupied Housing Units	1,613	83,525	266,593	2,126,279
Renter occupied Housing Units	333	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Greenwich Township	Gloucester County	Region	New Jersey
Largest Industry	Educational Services and Health Care and Social Assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

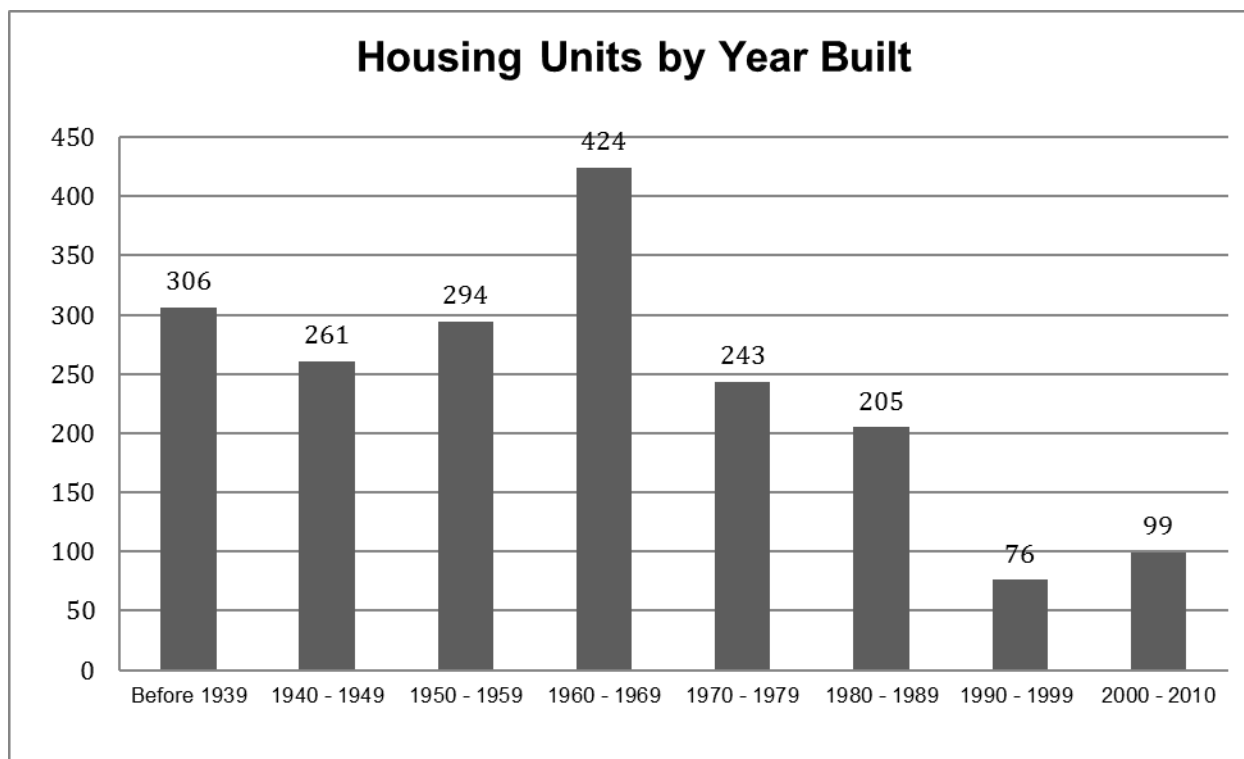
Table GC.8-6 illustrates how Greenwich Township ranks in the county and the four county region.

Table GC.8-6: Greenwich Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (Total of 90)
Median Household Income Rank	18	45
Vacant Housing Rank	17	56
Renter Occupied Housing Rank	14	52

Figure GC.8-3 illustrates development patterns in Greenwich Township by examining housing units by year built. One in five homes in Greenwich Township was built during the 1960s.

Figure GC.8-3: Greenwich Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Flood

Moderate Priority

- Extreme Temperature: Cold & Hot
- Levee Failure
- Severe Weather – Summer
- Severe Weather – Winter

Low Priority

- Coastal Erosion & Sea Level Rise
- Dam Failure
- Drought
- Earthquake
- High Wind
- Wildfire

One additional hazard was discussed but was not considered applicable to the municipality:

- Geologic Hazards

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3: Hazard Identification and Risk Assessment

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.8-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.8-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge)	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where inundation due to storm surge may occur
Table RP.D-81	Levee Failure	Levee Inventory	Provide information about levee configuration
Figure RP.D-85	Levee Failure	Levee Locations	Identify locations of levees in and around the municipality
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.8-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.8-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.8-8: Greenwich Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Township Hall	Municipal	Administrative Offices	420 Washington Street, Gibbstown	CF-10	N	N		M-5
CF-2	Court House	Municipal	Administrative Offices	21 North Walnut Street, Gibbstown	CF-8	N	N		M-6
CF-3	Emergency Operations Center	EOC	Co-located Facilities	700 East Broad Street, Gibbstown	CF-5	N	Y		
CF-4	Police Station	Law Enforcement Facilities	Stations	421 West Broad Street, Gibbstown		N	N		M-7
CF-5	Gibbstown Fire Department	FireStation	Stations	700 East Broad Street, Gibbstown	CF-3	N	Y		
CF-6	Public Works	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	1200 Memorial Avenue, Gibbstown	CF-7	N	N		M-8
CF-7	Water Tower	Utilities – Water	Water Towers		CF-6	N/A	N		M-9
CF-8	Wellhead	Utilities – Water	Wellheads	21 North Walnut Street, Gibbstown	CF-2	N/A	N		M-6
CF-9	Well #4A / Water Treatment Plant	Utilities – Water	Wellheads / Treatment Plants	1200 Memorial Avenue, Gibbstown		N/A	N		M-10
CF-10	Wellhead #5 / Treatment Plant	Utilities – Wastewater	Wellheads / Treatment Plants	420 Washington Street, Gibbstown		N/A	N		M-11 / M-16
CF-11	Wellhead #6	Utilities – Water	Wellheads	Harmony Road, Gibbstown		N/A	N		M-12
CF-12	Wastewater Treatment Plant	Utilities – Wastewater	Treatment Plants	61 North School Street, Gibbstown		N/A	N		M-13 / M-19
CF-13	Lift Station	Utilities – Wastewater	Pump Stations / Lift Stations			N/A	Y		
CF-14	Guardian Angels Regional Catholic School	Schools	Private Schools	150 South School Street, Gibbstown		N	N		
CF-15	Greenwich Township Elementary School	Schools	Public Schools	225 West Broad Street, Gibbstown		Y	N		M-14
CF-16	Nehaunsey Middle School	Schools	Public Schools	415 Swedesboro Road, Gibbstown		Y	N		M-15 / M-17

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-17	Independent Oil Workers at Paulsboro	Emergency Staging Areas	Evacuation	911 Billingsport Road, Gibbstown		Y	N		
CF-18	St. Michaels Mutual Club	Emergency Staging Areas	Evacuation	406 Memorial Avenue, Gibbstown		Y	N		
CF-19	VFW Post 5579	Emergency Staging Areas	Evacuation	743 West Broad Street, Gibbstown		Y	N		

Part 3: Hazard Identification and Risk Assessment

Table GC.8-9: Greenwich Township (Gloucester County) Critical Facilities Hazard Exposure²

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Township Hall	N/A	N/A	N/A											
CF-2	Court House	N/A	N/A	N/A											
CF-3	Emergency Operations Center	N/A	N/A	N/A											
CF-4	Police Station	N/A	N/A	N/A											
CF-5	Gibbstown Fire Department	N/A	N/A	N/A											
CF-6	Public Works	N/A	N/A	N/A											
CF-7	Water Tower	N/A	N/A	N/A											
CF-8	Wellhead	N/A	N/A	N/A											
CF-9	Well #4A / Water Treatment Plant	N/A	N/A	N/A											
CF-10	Wellhead #5 / Water Treatment Plant	N/A	N/A	N/A											
CF-11	Wellhead #6	N/A	N/A	N/A											
CF-12	Wastewater Treatment Plant	N/A	N/A	N/A											
CF-13	Lift Station	N/A	N/A	N/A											
CF-14	Guardian Angels Regional Catholic School	N/A	N/A	N/A											
CF-15	Greenwich Township Elementary School	N/A	N/A	N/A											
CF-16	Nehaunsey Middle School	N/A	N/A	N/A											
CF-17	Independent Oil Workers at Paulsboro	N/A	N/A	N/A											

² **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-18	St. Michaels Mutual Club	N/A	N/A	N/A											
CF-19	VFW Post 5579	N/A	N/A	N/A											

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as initial risk reduction efforts
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures, to include repetitive flood loss properties
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.8-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.8-10.

Table GC.8-10: Status of Greenwich Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Greenwich 1: Engineering study to determine appropriate flood mitigation action for EOC/Fire building located on E. Broad Street.	Completed.	Issue was resolved through Conrail's maintenance work in the area. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Greenwich 2: Engineering study to determine appropriate flood mitigation action for Wastewater Treatment facility located on Washington Street (located in a flood zone).	Not completed, not funded.	Mitigation measure is included in Municipal Appendix.	M-16
Greenwich 3: Engineering study to determine appropriate flood mitigation action for shelter at Nehaunsey School located on Swedesboro Road.	Not completed, not funded.	Mitigation measure is included in Municipal Appendix.	M-17
Greenwich 4: Engineering study to determine appropriate flood mitigation action for Valero Refinery located at Billingsport Road (in 100-year flood plain area).	Not completed, not funded.	Issue is not considered valid. The refinery is currently under new ownership. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A

Table GC.8-10 Notes:

- A. See Tables GC.8-11 and GC.8-12 for municipal (M-#) mitigation measures
- B. See Table GC.8-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality

Table GC.8-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.8
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Table GC.8-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.8-4.

Table GC.8-11: Greenwich Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk to include monitoring and maintenance of privately owned dams• Best practices for hazard mitigation at the individual or property level.	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #3	Both
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #4	Both
M-5	Install permanent backup emergency power generator at Township Hall (CF-1). ²	All	Goal #4	Both

¹ See Section 3: Hazard Identification and Risk Assessment and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-6	Install permanent backup emergency power generator at Municipal Court and wellhead at 21 North Walnut Street (CF-2) / (CF-8). ²	All	Goal #4	Both
M-7	Install permanent backup emergency power generator at Police Station (CF-4). ²	All	Goal #4	Both
M-8	Install permanent backup emergency power generator at Public Works Building (CF-6). ²	All	Goal #4	Both
M-9	Install permanent backup emergency power generator for Water Tower (CF-7). ²	All	Goal #4	Both
M-10	Install permanent backup emergency power generator at Well #4A / Water Treatment Plant (CF-9). ²	All	Goal #4	Both
M-11	Install permanent backup emergency power generator for Wellhead #5 / Treatment Plant (CF-10). ²	All	Goal #4	Both
M-12	Install permanent backup emergency power generator for wellhead #6 on Harmony Road (CF-11). ²	All	Goal #4	Both
M-13	Install permanent backup emergency power generator for Wastewater Treatment Plant on North School Street (CF-12). ²	All	Goal #4	Both
M-14	Install permanent backup emergency power generator for Greenwich Township Elementary School (CF-15).	All	Goal #4	Both
M-15	Install permanent backup emergency power generator for Nehaunsey Middle School (CF-16).	All	Goal #4	Both
M-16	Engineering study to determine appropriate flood mitigation action for Wastewater Treatment facility located on Washington Street (located in a flood zone) (CF-10).	Flood	Goal #4	Both
M-17	Engineering study to determine appropriate flood mitigation action for shelter at Nehaunsey Middle School located (CF-16).	Flood	Goal #4	Both
M-18	Address identified Repetitive Flood Loss Properties.	Flood	Goal #4	Existing
M-19	Hazard threat assessment related to Wastewater Treatment facility located in flood zone on 61 North School Street (CF-12). ³	Flood	Goal #4	Both

² Project included in Letter of Interest (LOI) for DR 4086 HMGP. LOI project #s 1230 & 2064 budget = \$640,000.00 & \$646,500.00.

³ Although natural hazards are the focus of the NJ4 HMP, these technological hazards are a continuing concern to the community and are documented in the Municipal Appendix to reflect the full range of hazards within Greenwich Township.

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures

Table GC.8-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria⁴
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁵
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.8-12: Greenwich Township (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	High	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Public Works Department	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Public Works Department	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish priorities, procedures, and reporting process for data collection.
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	Municipal OEM and Municipal Working Group	High	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁵ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Install permanent backup emergency power generator at Township Hall (CF-1).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Install permanent backup emergency power generator at Municipal Court and wellhead at 21 North Walnut Street (CF-2) / (CF-8).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-7	Install permanent backup emergency power generator at Police Station (CF-4). ²	Municipal OEM, Public Works Department, and Police Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-8	Install permanent backup emergency power generator at Public Works Building (CF-6).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-9	Install permanent backup emergency power generator for Water Tower (CF-7). ²	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-10	Install permanent backup emergency power generator at Well #4A / Water Treatment Plant (CF-9). ²	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-11	Install permanent backup emergency power generator for Wellhead #5 / Treatment Plant (CF-10). ²	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-12	Install permanent backup emergency power generator for wellhead #6 on Harmony Road (CF-11). ²	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-13	Install permanent backup emergency power generator for Wastewater Treatment Plant on North School Street (CF-12). ²	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-14	Install permanent backup emergency power generator for Greenwich Township Elementary School (CF-15).	Municipal OEM and Public Works Department	Moderate	Back-up Emergency Power Generator	< \$50K	Three to five years	Conduct project scoping.
M-15	Install permanent backup emergency power generator for Nehaunsey Middle School (CF-16).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$50K	Three to five years	Conduct project scoping.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-16	Engineering study to determine appropriate flood mitigation action for Wastewater Treatment facility located on Washington Street (located in a flood zone) (CF-10).	Municipal OEM and Public Works Department	Low	Public Property Flood Mitigation	< \$50K	One to three years	Conduct project scoping.
M-17	Engineering study to determine appropriate flood mitigation action for shelter at Nehaunsey Middle School (CF-16).	Municipal OEM and Public Works Department	Low	Public Property Flood Mitigation	< \$50K	One to three years	Conduct project scoping.
M-18	Address identified Repetitive Flood Loss Properties.	Municipal OEM and Public Works Department	Low	Private Property Flood Mitigation	\$100K – \$1M	Three to five years	Identify mitigation options including eligible activities per FEMA HMA programs.
M-19	Hazard threat assessment related to Wastewater Treatment facility located in flood zone on 61 North School Street (CF-12).	Municipal OEM and Public Works Department	Moderate	Risk / Threat Assessment	< \$50K	Three to five years	Develop scope of work for risk / threat assessment and procure professional consulting services.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.8-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

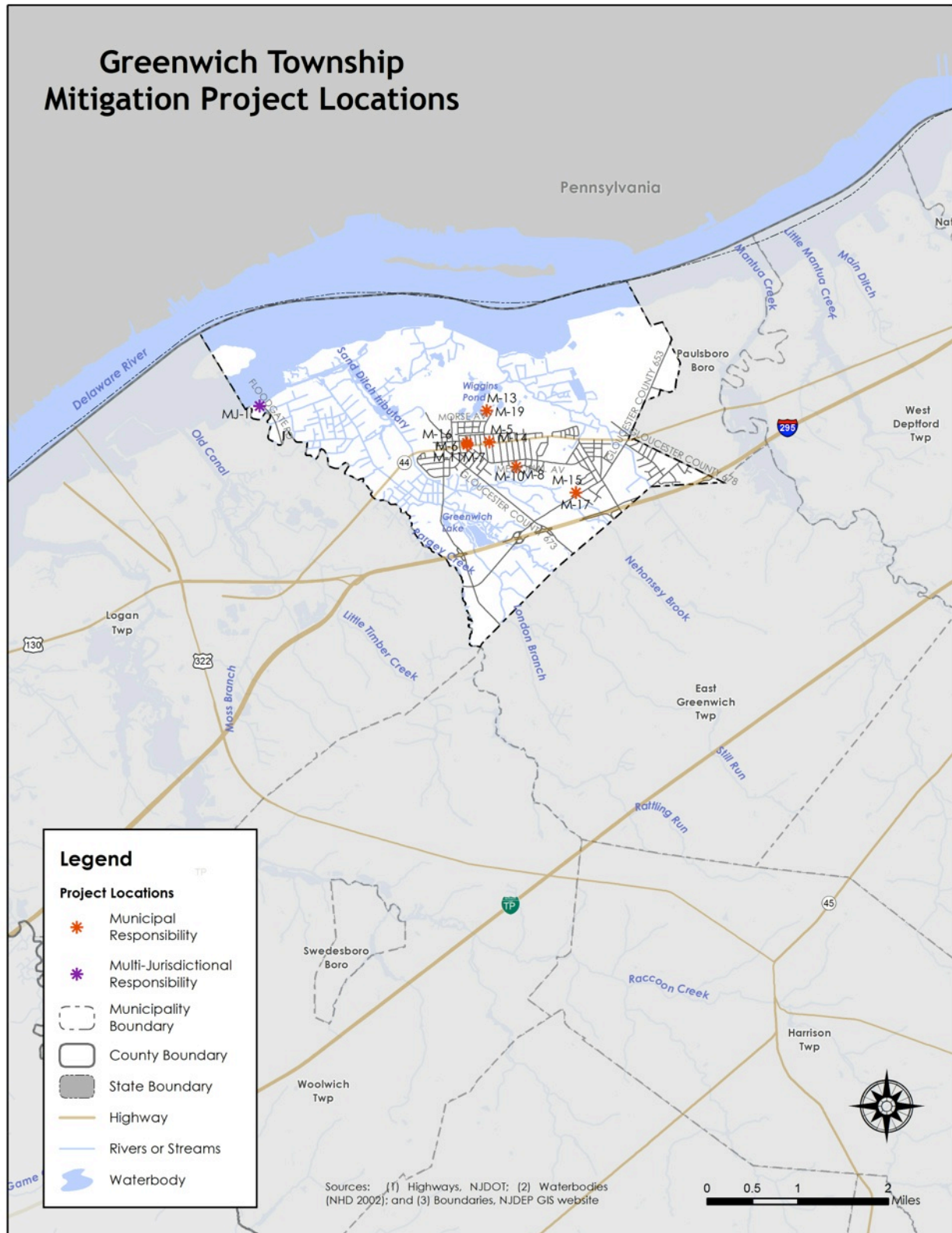
Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.8-4.

Table GC.8-13: Greenwich Township (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Sluice gate clean-up / debris removal at Floodgate Road and Delaware River.	Flood	Goal #4	Existing	Municipal OEM, DuPont Facilities	Moderate

Part 4: Mitigation Measures

Figure GC.8-4: Greenwich Township Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan (2011)
- Floodplain Ordinance ⁶
- Master Plan (1999)
- Land Use and Development Ordinances ⁷
- Stormwater Management Plan ⁸
- Capital Improvement Ordinance (2014)

⁶ <http://www.ecode360.com/12210943#12210943>

⁷ <http://www.ecode360.com/12212764#12212764>

⁸ <http://www.ecode360.com/12211813#12211813>

Attachment A: Public Review Comments

The following comments were received during the public review of the Greenwich Township Municipal Appendix:

Table GC.8.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Greenwich Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.9
Harrison Township, New Jersey

Draft

May 29, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.9-i
Part 1 Overview	GC.9-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.9-1
1.2: Harrison Township (Gloucester County) Municipal Appendix	GC.9-1
Part 2 Participation	GC.9-2
2.1: Municipal Working Group Participation	GC.9-2
2.2: Public Participation	GC.9-4
Part 3 Hazard Identification and Risk Assessment	GC.9-5
3.1: Municipal Profile	GC.9-5
3.2: Hazard Priorities	GC.9-9
3.3: Hazard Mapping	GC.9-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.9-11
Part 4 Mitigation Measures	GC.9-18
4.1: Mitigation Goals and Strategy	GC.9-18
4.2: SDVR HMP Mitigation Measures	GC.9-19
4.3: Municipal Mitigation Measures – Identification	GC.9-20
4.4: Municipal Mitigation Measures – Implementation	GC.9-21
4.5: Multi-Jurisdictional Mitigation Measures	GC.9-23
4.6: Plan Review and Integration	GC.9-25

Table of Contents

List of Figures

Figure GC.9-1: Harrison Township (Gloucester County) Location Map	GC.9-5
Figure GC.9-2: Harrison Township Base Map	GC.9-6
Figure GC.9-3: Harrison Township Housing Units by Year Built	GC.9-8
Figure GC.9-4: Harrison Township Mitigation Project Locations	GC.9-24

List of Tables

Table GC.9-1: Harrison Township (Gloucester County) Working Group	GC.9-2
Table GC.9-2: Public Participation	GC.9-4
Table GC.9-3: Harrison Township Demographics	GC.9-7
Table GC.9-4: Harrison Township Demographic Rankings	GC.9-7
Table GC.9-5: Harrison Township Economics and Housing	GC.9-7
Table GC.9-6: Harrison Township Ranking (Economics and Housing)	GC.9-8
Table GC.9-7: Supporting Mapping and Exhibits	GC.9-10
Table GC.9-8: Harrison Township Critical Facilities Inventory	GC.9-12
Table GC.9-9: Harrison Township Critical Facilities Hazard Exposure	GC.9-15
Table GC.9-10: Status of Harrison Township SDVR HMP Mitigation Measures	GC.9-19
Table GC.9-11: Harrison Township Municipal Mitigation Measures Identification	GC.9-20
Table GC.9-12: Harrison Township Municipal Mitigation Measures Implementation	GC.9-22
Table GC.9-13: Harrison Township Multi-Jurisdictional Mitigation Measures	GC.9-23

Attachments

Attachment GC.9.A: Public Review Comments	GC.9.A-1
Attachment GC.9.B: Adoption Resolution	GC.9.B-1
Attachment GC.9.C: Approval Letter	GC.9.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Harrison Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Harrison Township in Gloucester County, New Jersey.

The Harrison Township Municipal Working Group recommended the Harrison Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Harrison Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.9-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.9-1: Harrison Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Working Group Meeting ³	Contribution ⁴
Brian	Bartholomew	Harrison Township Office of Emergency Management (OEM)	Emergency Management Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Michael	Datz	Harrison Township OEM	Deputy Emergency Management Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Frank	Rodgers	Harrison Township OEM	Assistant Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Mark	Gravinese	Harrison Township Administration	Township Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Updated Township Committee on any changes during the development of the Appendix.
Daneen	Fuss	Harrison Township Clerk's Office	Deputy Municipal Clerk / Deputy Registrar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Recorded minutes for Working Group Work Sessions and Meetings.

¹ Round 1 Work Session was held on July 30, 2014.

² Round 2 Work Session was held on October 9, 2014.

³ A Working Group Meeting was held on April 14, 2015.

⁴ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.9-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Working Group Meeting ³	Contribution ⁴
Thomas	Mills	Harrison Township Police Department	Chief of Police	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Dennis	Chambers	Harrison Township Public Works Department	Deputy Township Administrator / Superintendent of Public Works	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Mike	Gonserkevis	Harrison Township Wastewater Department	Superintendent	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Provided detailed information regarding wastewater system and facilities.
Jeff	Kier	Harrison Township Construction Department	Construction Official / Floodplain Administrator			<input checked="" type="checkbox"/>	Reviewed Municipal Appendix.

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁵

- Community / Faith-Based Organizations
- Healthcare Institutions
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS/IT Specialist
- Business Associations
- Major Employers and Businesses

⁵ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.9-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.9-2: Public Participation

Date	Type of Involvement	Location
October 9, 2014	Link to Project Website (http://nj4hmp.com) established	Harrison Township website ⁶
October 20, 2014 and November 17, 2014	Information item included on Harrison Township Committee agenda identifying opportunities for public participation	Harrison Township Municipal Building
November 5, 2014	Public meeting with presentation and open discussion on Harrison Township Environmental Commission agenda identifying opportunities for public participation	Harrison Township Municipal Building
December 14, 2014	Letter sent to local business owners	n/a
November 18, 2014	Preliminary Municipal Appendix posted to website for public comment	Harrison Township website ⁷
April 20, 2015	Public hearing included on Harrison Township Committee agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Harrison Township Municipal Building
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁸ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁹

⁶ www.harrisontwp.us

⁷ www.harrisontwp.us

⁸ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁹ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

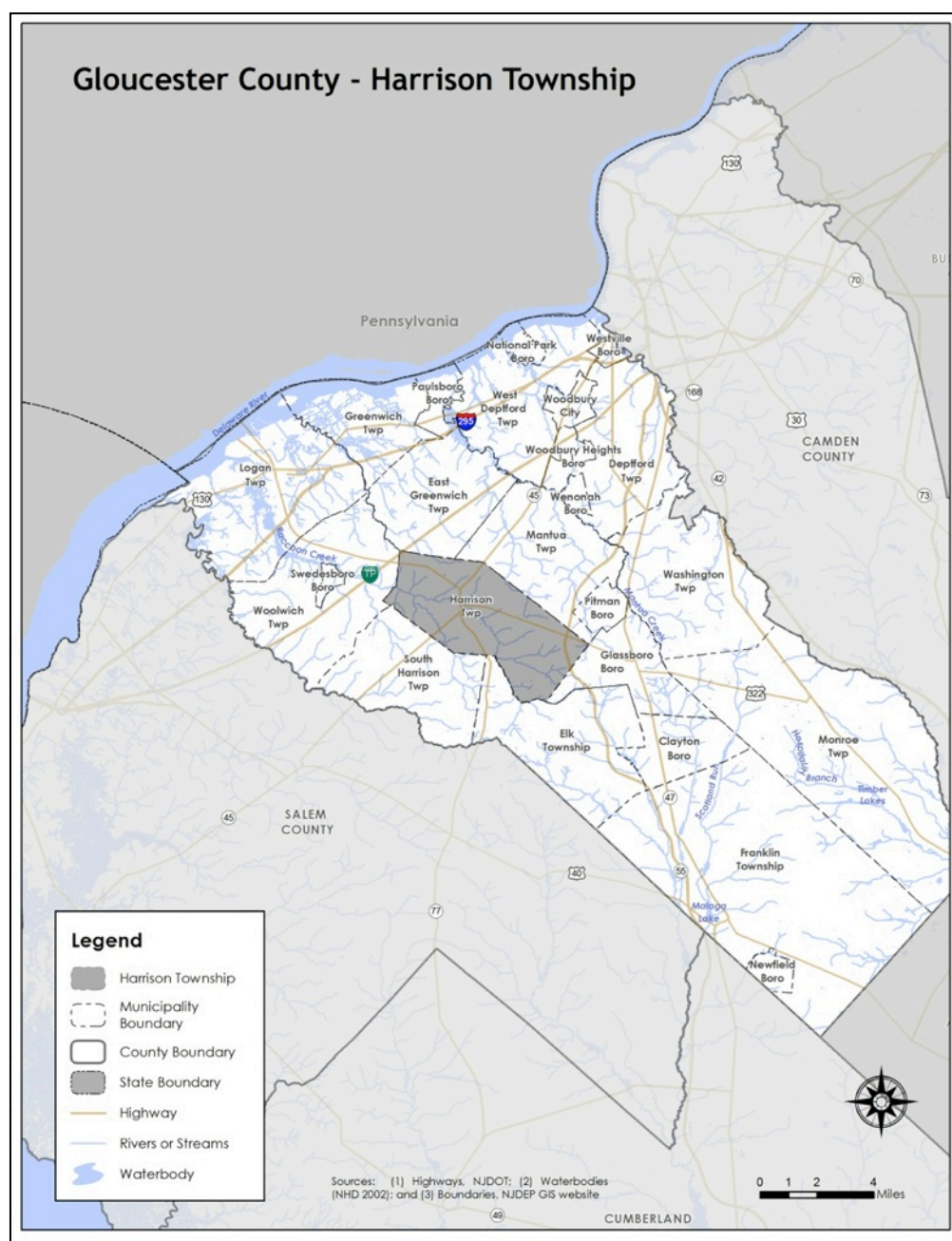
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Harrison Township is located in the west-central part of Gloucester County (See Figure GC.9-1).

Figure GC.9-1: Harrison Township (Gloucester County) Location Map

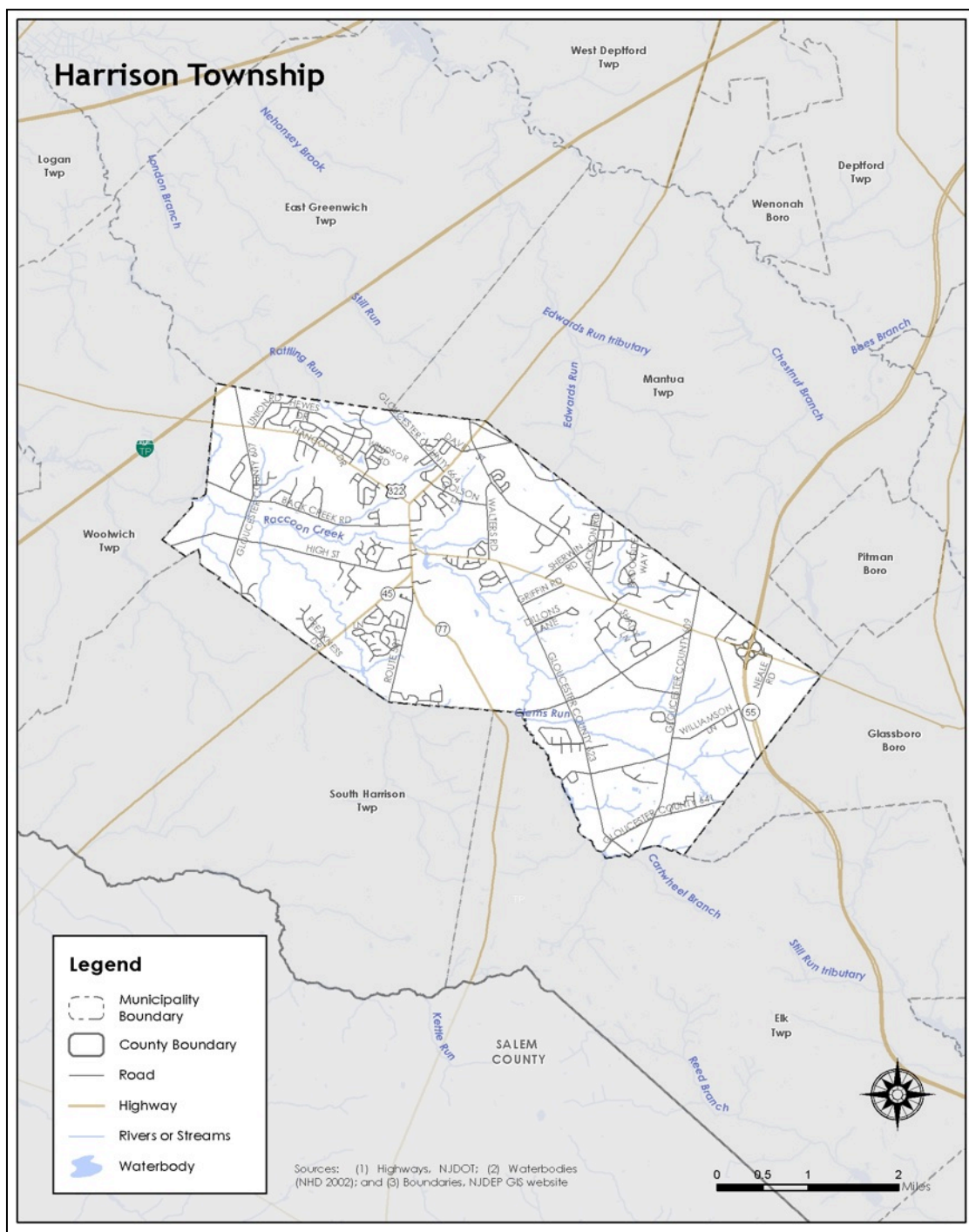


Part 3: Hazard Identification and Risk Assessment

Harrison Township is an inland suburban township. Unincorporated communities in the municipality include Ewan, Jefferson, Mullica Hill, and Richwood. The Township has experienced significant growth in the period between 1990 and 2010 according to the increase in population shown in the most recent census and the fact that nearly 60 percent of the housing stock has been built since 1990.

Per Figure GC.9-2, major water courses include Raccoon Creek and Clems Run. Major transportation routes include U.S. Highway 322 and State Highway 45. The land is gently rolling.

Figure GC.9-2: Harrison Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.9-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.9-3: Harrison Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Harrison Township	Gloucester County	Region	New Jersey
2000 Population	8,788	254,673	974,328	8,414,350
2010 Population	12,417	288,288	1,024,926	8,791,894
Percent Change	41.29%	13.2%	5.19%	4.49%
Population Density	648.7 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	19.14 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	31.8	24.4	24.1	23.5
% of Population 18 - 64	59.8	63.2	62.7	63
% of Population 65 and over	8.4	12.4	13.2	13.5

Table GC.9-4 illustrates how Harrison Township ranks in the county, the four county region, and New Jersey.

Table GC.9-4: Harrison Township Demographic Rankings

	Gloucester County (total of 24 municipalities)	Region (total of 90 municipalities)	New Jersey (total of 565 municipalities)
Population Rank	8	21	194
Land Area Rank	7	29	143
Population Density Rank	18	59	419
Population Change Rank	3	3	-

Table GC.9-5 includes information related to economic and housing statistics for Harrison Township, Gloucester County, the four county region, and New Jersey.

Table GC.9-5: Harrison Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Harrison Township	Gloucester County	Region	New Jersey
Date Incorporated	March 13, 1844	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$102,162	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	4,089	109,796	397,990	3,529,033
Occupied Housing Units	3,942	104,271	372,472	3,176,069
Vacant Housing Units	147	5,525	25,518	352,964
Owner Occupied Housing Units	3,532	83,525	266,593	2,126,279
Renter occupied Housing Units	410	20,746	105,879	1,049,790
Building Permits	42	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

Part 3: Hazard Identification and Risk Assessment

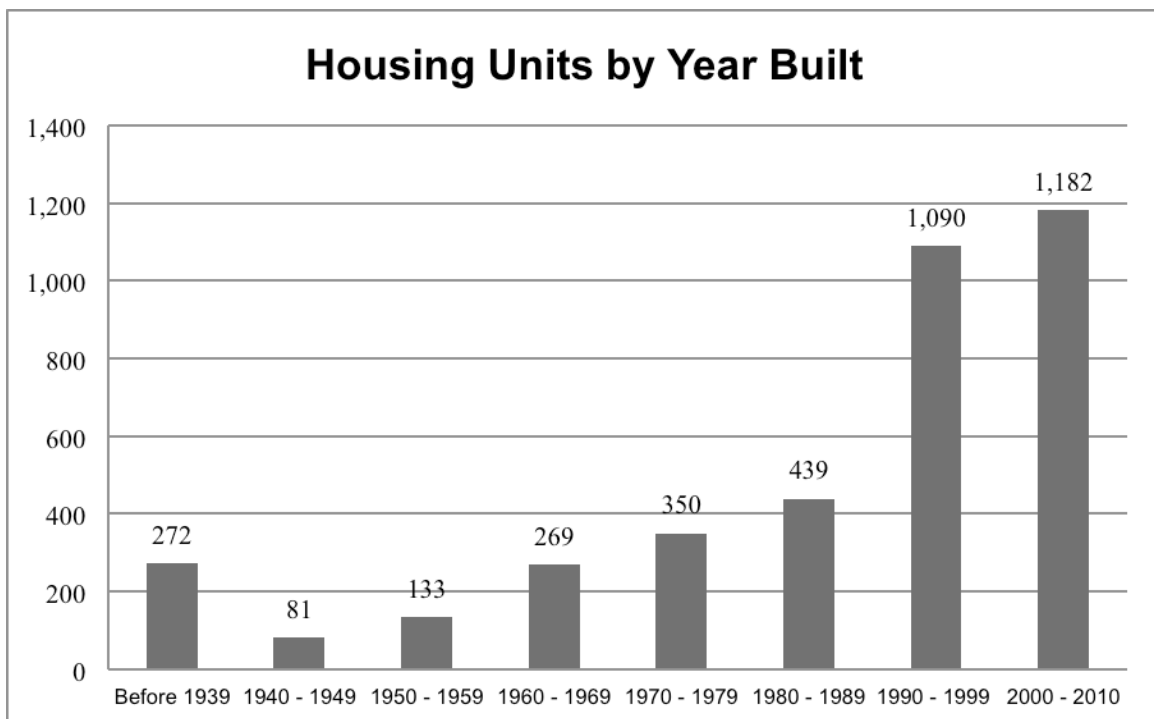
Table GC.9-6 illustrates how Harrison Township ranks in the county and the four county region.

Table GC.9-6: Harrison Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	4	6
Vacant Housing Rank	13	44
Renter Occupied Housing Rank	13	51
Building Permits Rank	7	12

Figure GC.9-3 illustrates development patterns in Harrison Township by examining housing units by year built. Nearly 29% of homes in Harrison Township were built between 2000 and 2010.

Figure GC.9-3: Harrison Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Flood
- High Wind
- Severe Weather – Summer

Moderate Priority

- Dam Failure

Low Priority

- Drought
- Earthquake
- Extreme Temperature: Cold & Hot
- Geologic Hazards
- Severe Weather – Winter

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion and Sea Level Rise
- Levee Failure
- Wildfire

¹ See *Section 3: Hazard Identification and Risk Assessment*.

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.9-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.9-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.9-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.9-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.9-8: Harrison Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Township Hall	Municipal	Administrative Offices	114 Bridgeton Pike, Mullica Hill		N	Y ²		M-4
CF-2	Emergency Operations Center	EOC	Co-located Facilities	114 Bridgeton Pike, Mullica Hill	CF-1	N	Y ²		M-4
CF-3	Police Station	Law Enforcement Facilities	Stations	137 North Main Street, Mullica Hill		N	Y		
CF-4	Station 23-1 Harmony Fire Company	Fire Stations / EMS	Stations	4 South Main Street, Mullica Hill		Y	Y		
CF-5	Station 23-2 Ewan Fire Company	Fire Stations	Stations	312 Ewan Street, Mullica Hill		Y	Y	Back-up EOC	
CF-6	Public Works Yard	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	151 Colson Lane, Mullica Hill		N	N ³		M-5
CF-7	Wastewater Treatment Department Office	Utilities - Wastewater	Administrative Offices	35 Woodland Avenue, Mullica Hill		N	Y		
CF-8	Wastewater Treatment Plant	Utilities - Wastewater	Treatment Plant	40 Woodland Avenue, Mullica Hill	CF-7	N/A	Y	Permitted @ 800,000 gpd	
CF-9	Wastewater Pump Station #1	Utilities - Wastewater	Pump Stations	16 Mill Road, Mullica Hill		N/A	Y		
CF-10	Wastewater Pump Station #2	Utilities - Wastewater	Pump Stations	7 Mt. Calvary Lane Mullica Hill		N/A	Y		
CF-11	Wastewater Pump Station #3	Utilities - Wastewater	Pump Stations	2 Howey Drive, Mullica Hill		N/A	Y		
CF-12	Wastewater Pump Station #4	Utilities - Wastewater	Pump Stations	119 Swedesboro Road, Mullica Hill		N/A	Y		

² As of 10.9.14, a generator that recently failed had been replaced with a surplus generator of adequate capacity but circuit revisions are still required to provide back-up emergency power to the whole facility.

³ Per Harrison Township Department of Public Works, back-up generator capacity of 150 kW is required to maintain service in the event of a power disruption.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-13	Wastewater Pump Station #5	Utilities - Wastewater	Pump Stations	513 Cohawkin Road, Mullica Hill		N/A	Y ⁴		M-6
CF-14	Wastewater Pump Station #6	Utilities - Wastewater	Pump Stations	405 Station Court, Mullica Hill		N/A	Y ⁴		M-7
CF-15	Wastewater Pump Station #7	Utilities - Wastewater	Pump Stations	45 Fostertown Lane, Mullica Hill		N/A	Y		
CF-16	Wastewater Pump Station #8	Utilities - Wastewater	Pump Stations	304 Stayman Court, Mullica Hill		N/A	Y		
CF-17	Wastewater Pump Station #9	Utilities - Wastewater	Pump Stations	1431A Swan Lane, Mullica Hill		N/A	Y		
CF-18	Wastewater Pump Station #10	Utilities - Wastewater	Pump Stations	8 Poplar Court, Mullica Hill		N/A	Y		
CF-19	Wastewater Pump Station #11	Utilities - Wastewater	Pump Stations	20 Banff Drive, Mullica Hill		N/A	Y		
CF-20	Wastewater Pump Station #12	Utilities - Wastewater	Pump Stations	300A Darwin Court, Mullica Hill		N/A	Y ⁴		M-8
CF-21	Wastewater Pump Station #13	Utilities - Wastewater	Pump Stations	151 Colson Lane, Mullica Hill		N/A	Y ⁴		M-9
CF-22	Wastewater Pump Station #14	Utilities - Wastewater	Pump Stations	155 Commissioners Road, Mullica Hill		N/A	N ⁵	Baseball Complex	
CF-23	Wastewater Pump Station #15 ⁶	Utilities - Wastewater	Pump Stations	208 Windsor Road, Mullica Hill		N/A	Y		
CF-24	Wastewater Pump Station #16	Utilities - Wastewater	Pump Stations	162 Waters Road, Mullica Hill		N/A	N ⁵	Soccer Complex	
CF-25	Wastewater Pump Station #17 ⁷	Utilities - Wastewater	Pump Stations	Block 52, Lot 6, Mullica Hill		N/A	Y		
CF-26	Clearview Regional High School	Schools	Public Schools	625 Breakneck Road, Mullica Hill		Y	Y ⁸		M-10
CF-27	Clearview Regional Middle School	Schools	Public Schools	595 Jefferson Road, Mullica Hill		N	Y ⁸		
CF-28	Harrison Township Elementary School	Schools	Public Schools	120 North Main Street, Mullica Hill		Y	Y		

⁴ Portable back-up generator hook-up at pump station. Harrison Township WWTD has portable generator and bypass pump.

⁵ Seasonal use only. Back-up emergency power generators are not required.

⁶ As of 10.9.14, Harrison Township WWTD has not taken responsibility for maintenance pending resolution of problems with pump station structure

⁷ As of 10.9.14, facility is under construction and Harrison Township WWTD has not taken responsibility for maintenance and operation pending completion of construction and demonstration of successful operation

⁸ Back-up generator provides partial building coverage for emergency lighting.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-29	Pleasant Valley Elementary School	Schools	Public Schools	401 Cedar Road, Mullica Hill		Y	Y ⁸		M-11
CF-30	Friends School	Schools	Private Schools	15 High Street, Mullica Hill		Y	N	K through 8 th Grade	M-12
CF-31	Free To Be Me Day Care	Vulnerable Populations Facilities	Private Child Day Care	63 Woodstown Road, Mullica Hill		N	N	Capacity = 100 children	
CF-32	Giant Steps Day Care	Vulnerable Populations Facilities	Private Child Day Care	351 Mullica Hill Road, Mullica Hill		N	N	Capacity = 35 children	
CF-33	Richwood Pre-School	Vulnerable Populations Facilities	Private Child Day Care	325 Ewan Road, Mullica Hill		N	N	Capacity = 15 children	
CF-34	All Children Smile Day Care	Vulnerable Populations Facilities	Private Child Day Care	39 Colson Lane, Mullica Hill		N	N	Capacity = 100 children	
CF-35	Goddard School Day Care	Vulnerable Populations Facilities	Private Child Day Care	223 North Main Street, Mullica Hill		N	N	Capacity = 100 children	
CF-36	Holding Hands Day Care	Vulnerable Populations Facilities	Private Child Day Care	138 Tomlin Station Road, Mullica Hill		N	N	Capacity = 75 children	
CF-37	Mullica Hill Gardens	Vulnerable Populations Facilities	Private Assisted Living	161 Mullica Hill Road Mullica Hill		Y ⁹	Y	Under construction as of 10.9.14	

⁹ Shelter-in-place.

Part 3: Hazard Identification and Risk Assessment

Table GC.9-9: Harrison Township (Gloucester County) Critical Facilities Hazard Exposure¹⁰

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Township Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-3	Police Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-4	Station 23-1Harmony Fire Company	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-5	Station 23-2Ewan Fire Company	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-6	Public Works Yard	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-7	Wastewater Treatment Department Office	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-8	Wastewater Treatment Plant	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-9	Wastewater Pump Station #1	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-10	Wastewater Pump Station #2	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-11	Wastewater Pump Station #3	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-12	Wastewater Pump Station #4	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-13	Wastewater Pump Station #5	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-14	Wastewater Pump Station #6	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-15	Wastewater Pump Station #7	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-16	Wastewater Pump Station #8	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A

¹⁰ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-17	Wastewater Pump Station #9	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-18	Wastewater Pump Station #10	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-19	Wastewater Pump Station #11	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-20	Wastewater Pump Station #12	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-21	Wastewater Pump Station #13	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-22	Wastewater Pump Station #14	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-23	Wastewater Pump Station #15	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-24	Wastewater Pump Station #16	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-25	Wastewater Pump Station #17	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-26	Clearview Regional High School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-27	Clearview Regional Middle School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-28	Harrison Township Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-29	Pleasant Valley Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-30	Friends School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-31	Free To Be Me Day Care	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-32	Giant Steps Day Care	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-33	Richwood Pre-School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-34	All Children Smile Day Care	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-35	Goddard School Day Care	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-36	Holding Hands Day Care	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-37	Mullica Hill Gardens	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as initial risk reduction efforts
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.9-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.9-10.

Table GC.9-10: Status of Harrison Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Harrison 1: Property acquisition, private house located at Ellis Mill Road at Lake Gilman.	Not completed, not funded.	Property had experienced repetitive flooding in the past but is not currently listed as a Repetitive Flood Loss Property. Recent dam replacement has alleviated the problem. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Harrison 2: Engineering study to determine appropriate flood mitigation action for Fire/EMS (Harrison Firehouse) located on 312 Ewan Road, Mullica Hill.	Not completed, not funded.	Harrison Township Fire District consulting engineer is currently working with Gloucester County Engineering Department to identify solutions. Multi-jurisdictional mitigation measure included in updated Municipal Appendix.	MJ-1
Harrison 3: Engineering study to determine appropriate flood mitigation action for Wastewater Treatment Facility, Woodland Avenue.	Not completed, not funded.	Facility has not experienced flooding per Municipal Working Group and 2010 PFIRM does not show the facility is located in the floodplain. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A

Table GC.9-10 Notes:

- A. See Tables GC.9-11 and GC.9-12 for municipal (M-#) mitigation measures
- B. See Table GC.9-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.9-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Note: Harrison Township does not currently have RL or SRL properties per information provided by the New Jersey Department of Environmental Protection.

Table GC.9-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.9-4.

Table GC.9-11: Harrison Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-4	Upgrade back-up emergency power generator at Township Hall located at 114 Bridgeton Pike (CF-1).	All	Goal #4	Both

¹ See Section 3: Hazard Identification and Risk Assessment and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-5	Install back-up emergency power generator at Public Works Yard located at 151 Colson Lane, Mullica Hill (CF-6).	All	Goal #4	Existing
M-6	Install permanent back-up emergency power generator at Wastewater Pump Station #5 located at 513 Cohawkin Road, Mullica Hill (CF-13).	All	Goal #4	Both
M-7	Install permanent back-up emergency power generator at Wastewater Pump Station #6 located at 405 Station Court, Mullica Hill (CF-14).	All	Goal #4	Both
M-8	Install permanent back-up emergency power generator at Wastewater Pump Station #12 located at 300A Darwin Court, Mullica Hill (CF-20).	All	Goal #4	Both
M-9	Install permanent back-up emergency power generator at Wastewater Pump Station #13 located at 151 Colson Lane, Mullica Hill (CF-21).	All	Goal #4	Both
M-10	Upgrade back-up emergency power generator at Clearview Regional High School located at 401 Cedar Road (CF-26).	All	Goal #4	Existing
M-11	Upgrade back-up emergency power generator at Pleasant Valley Elementary School located at 401 Cedar Road (CF-29).	All	Goal #4	Existing
M-12	Support acquisition and installation of permanent back-up emergency power generator for Friends School (CF-30) (designated shelter location).	All	Goal #4	Existing
M-13	Follow-up with landowner of floodprone property at Raccoon Creek to determine current need for and options for mitigation.	Flood	Goal #4	Existing

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.9-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria²
- Project Type to help determine funding options and implementation mechanisms at the municipal level³
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

² See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

³ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

Table GC.9-12: Harrison Township (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Low	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> Work with County Working Group to identify resource needs and availability. Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Low	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.
M-4	Upgrade back-up emergency power generator at Township Hall.	Municipal OEM	Moderate	Back-up Emergency Power Generator	< \$100K	Six months	Conduct project scoping.
M-5	Install back-up emergency power generator at Public Works Yard.	Public Works Department	Moderate	Back-up Emergency Power Generator	< \$100K	One year	Conduct project scoping.
M-6	Install permanent back-up emergency power generator at Wastewater Pump Station #5.	Wastewater Department	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-7	Install permanent back-up emergency power generator at Wastewater Pump Station #6.	Wastewater Department	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-8	Install permanent back-up emergency power generator at Wastewater Pump Station #12.	Wastewater Department	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-9	Install permanent back-up emergency power generator at Wastewater Pump Station #13.	Wastewater Department	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-10	Upgrade back-up emergency power generator at Clearview Regional High School located at 401 Cedar Road (CF-26).	School Board	Moderate	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-11	Upgrade back-up emergency power generator at Pleasant Valley Elementary School.	School Board	Moderate	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-12	Support acquisition and installation of permanent back-up emergency power generator for Friends School (CF-30) (designated shelter location).	Friends School and Municipal OEM	Moderate	Back-up Emergency Power Generator	< \$100K	Three to five years	Work with Friends School to conduct project scoping.
M-13	Follow-up with landowner of floodprone property at Raccoon Creek.	Floodplain Administrator	Low	Private Property Flood Mitigation	Staff time commitment	Six months	Identify mitigation options including eligible activities per FEMA HMA programs.

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.9-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures

Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.9-4.

Table GC.9-13: Harrison Township (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Engineering study to determine appropriate flood mitigation action for Fire Station (Ewan Fire Company) located on 312 Ewan Road, Mullica Hill (CF-5).	Flood	Goal #4	Existing	Municipal OEM, Gloucester County Engineering Department	To be determined

Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan (2012)
- Master Plan (2000 and multiple amendments) and Reexamination Reports (2008)⁴
- Land Development Ordinances including Floodplain Management⁵
- Zoning Map (2013)⁶
- Smart Growth Initiatives (2014)⁷
- 2014 Capital Improvement Budget and Capital Improvement Program⁸

⁴ <http://harrisontwp.us/municipal-departments/zoning-officer/resources/master-plan/>

⁵ <http://www.harrisontwp.us/government-municipal-departments-planning.html>

⁶ <http://ecode360.com/attachment/HA1928/HA1928-225c%20Zoning%20Map.pdf>

⁷ <http://www.harrisontwp.us/Township-Committee/2014/Melvin%20Smart%20Growth%20Letter%202014.pdf>

⁸ <http://www.harrisontwp.us/Finance/2014%20Budget%20Document.pdf>

Attachment A: Public Review Comments

The following comments were received during the public review of the Harrison Township Municipal Appendix:

Table GC.9.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of May 29, 2015, no public review comments were received for the Harrison Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.10
Logan Township, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.10-i
Part 1 Overview	GC.10-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.10-1
1.2: Logan Township (Gloucester County) Municipal Appendix	GC.10-1
Part 2 Participation	GC.10-2
2.1: Municipal Working Group Participation	GC.10-2
2.2: Public Participation	GC.10-4
Part 3 Hazard Identification and Risk Assessment	GC.10-5
3.1: Municipal Profile	GC.10-5
3.2: Hazard Priorities	GC.10-9
3.3: Hazard Mapping	GC.10-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.10-11
Part 4 Mitigation Measures	GC.10-14
4.1: Mitigation Goals and Strategy	GC.10-14
4.2: SDVR HMP Mitigation Measures	GC.10-15
4.3: Municipal Mitigation Measures – Identification	GC.10-16
4.4: Municipal Mitigation Measures – Implementation	GC.10-17
4.5: Multi-Jurisdictional Mitigation Measures	GC.10-19
4.6: Plan Review and Integration	GC.10-22

Table of Contents

List of Figures

Figure GC.10-1: Logan Township (Gloucester County) Location Map	GC.10-5
Figure GC.10-2: Logan Township Base Map	GC.10-6
Figure GC.10-3: Logan Township Housing Units by Year Built	GC.10-8
Figure GC.10-4: Logan Township Mitigation Project Locations	GC.10-21

List of Tables

Table GC.10-1: Logan Township (Gloucester County) Working Group	GC.10-2
Table GC.10-2: Public Participation	GC.10-4
Table GC.10-3: Logan Township Demographics	GC.10-7
Table GC.10-4: Logan Township Demographic Rankings	GC.10-7
Table GC.10-5: Logan Township Economics and Housing	GC.10-7
Table GC.10-6: Logan Township Ranking (Economics and Housing)	GC.10-8
Table GC.10-7: Supporting Mapping and Exhibits	GC.10-10
Table GC.10-8: Logan Township Critical Facilities Inventory	GC.10-12
Table GC.10-9: Logan Township Critical Facilities Hazard Exposure	GC.10-13
Table GC.10-10: Status of Logan Township SDVR HMP Mitigation Measures	GC.10-15
Table GC.10-11: Logan Township Municipal Mitigation Measures Identification	GC.10-16
Table GC.10-12: Logan Township Municipal Mitigation Measures Implementation	GC.10-18
Table GC.10-13: Logan Township Multi-Jurisdictional Mitigation Measures	GC.10-20

Attachments

Attachment GC.10.A: Public Review Comments	GC.10.A-1
Attachment GC.10.B: Adoption Resolution	GC.10.B-1
Attachment GC.10.C: Approval Letter	GC.10.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Logan Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Logan Township in Gloucester County, New Jersey.

The Logan Township Municipal Working Group recommended the Logan Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Logan Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.10-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.10-1: Logan Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Lyman	Barnes	Logan Township OEM / Administration	OEM Coordinator / Township Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Rob	Taylor	Logan Township OEM / Police Department	Deputy OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Joseph	Flatley	Logan Township OEM / Police Department	Deputy OEM Coordinator		<input checked="" type="checkbox"/>	
Scott	Oatman	Logan Township Bureau of Fire	Fire Marshal / Municipal Fire Chief	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
James	Schmidt	Logan Township Police Department	Police Chief		<input checked="" type="checkbox"/>	
Joseph	Weber	Logan Township Municipal Utilities Authority	Executive Director	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Terri	Lemesevski	Logan Township Administration	Administrative Assistant / Planning Board Secretary	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on July 30, 2014.

² Round 2 Work Session was held on October 14, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.10-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Charles	Bastow	Logan Township Department of Construction and Code Enforcement	Construction Official / Floodplain Administrator			The Floodplain Administrator reviewed the Preliminary Municipal Appendix and did not have any recommended changes.

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Construction Official / Floodplain Administrator
- Community / Faith-Based Organizations
- Major Employers and Businesses
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- Emergency Medical Services (Services provided by Gloucester County EMS)
- Business Associations
- Environmental Organizations
- Healthcare Institutions

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.10-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.10-2: Public Participation

Date	Type of Involvement	Location
October 15, 2014	Link to Project Website (http://nj4hmp.com) established	Logan Township website "Bulletin Board" ⁵
November 18, 2014	Preliminary Municipal Appendix posted to website for public comment	Logan Township website "Bulletin Board" ⁶
December 11, 2014	Public hearing providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Municipal Courtroom, Township Hall
December 16, 2014	Public hearing providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Municipal Courtroom, Township Hall
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁷ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁸

⁵ <http://www.logan-twp.org/board.cfm>

⁶ <http://www.logan-twp.org/board.cfm>

⁷ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁸ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

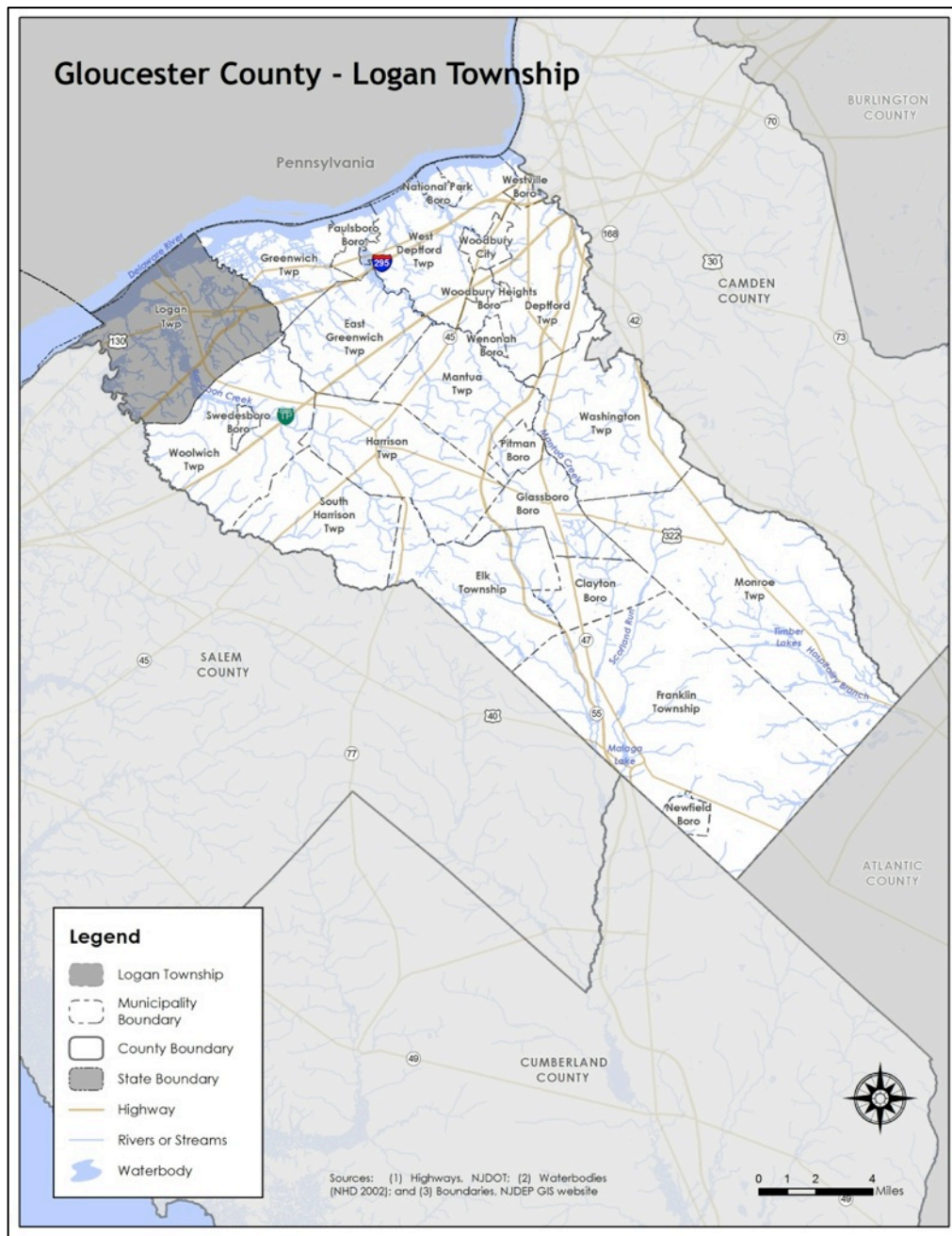
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Logan Township is located in the northwest corner of Gloucester County (See Figure GC.10-1).

Figure GC.10-1: Logan Township (Gloucester County) Location Map

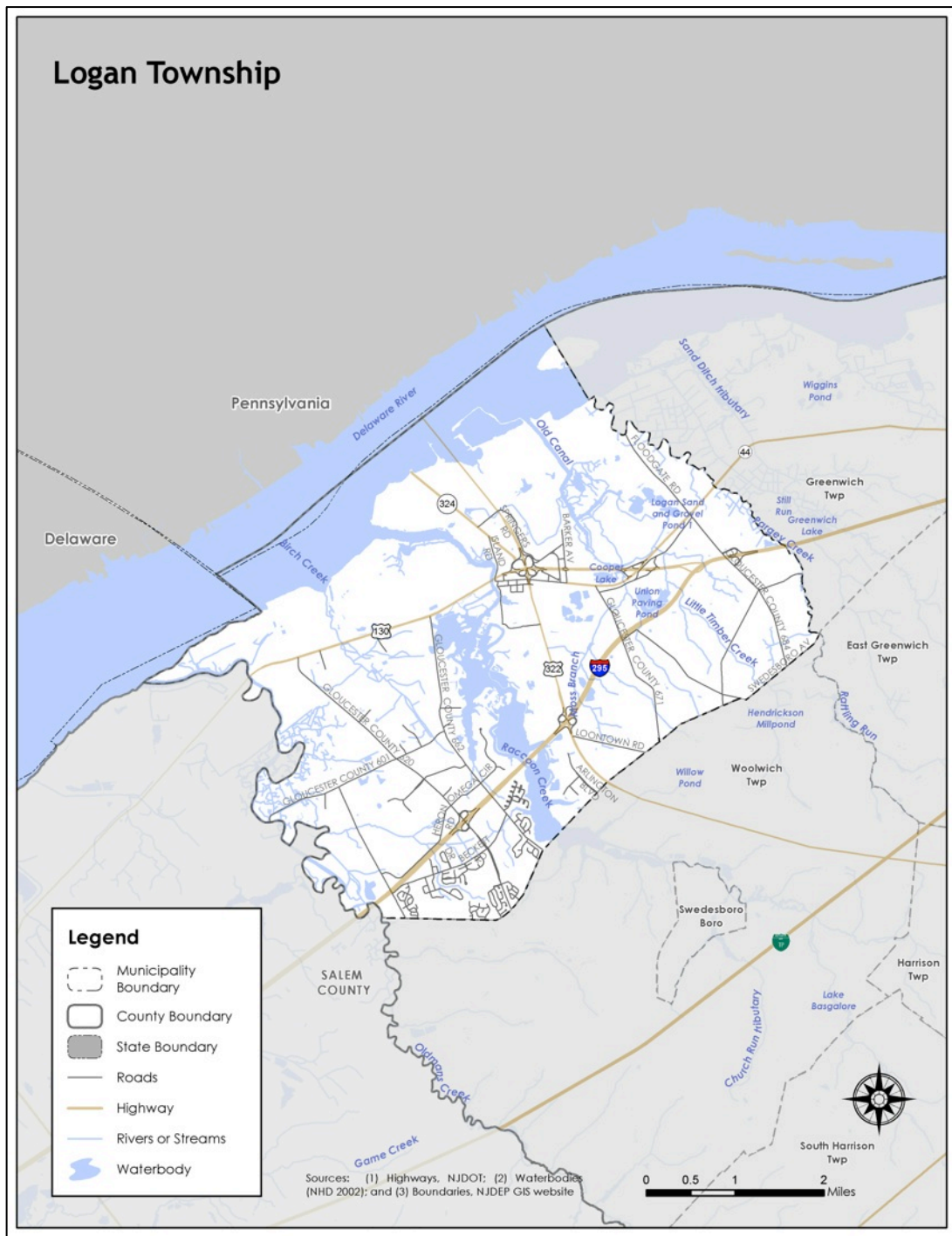


Part 3: Hazard Identification and Risk Assessment

Logan Township is a riverfront municipality with a stable population per recent census data and a diverse economic base. The Township includes large areas of lowlands and has a relatively low population density. Unincorporated communities in the municipality include: Beckett, Bridgeport, Center Square, Nortonville, and Repaupo.

Per Figure GC.10-2, the major water courses include the Delaware River and Raccoon Creek. Major transportation routes include Interstate 295 and U.S. Highway 322. The land is predominantly flat..

Figure GC.10-2: Logan Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.10-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.10-3: Logan Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Logan Township	Gloucester County	Region	New Jersey
2000 Population	6,032	254,673	974,328	8,414,350
2010 Population	6,042	288,288	1,024,926	8,791,894
Percent Change	0.17%	13.2%	5.19%	4.49%
Population Density	275.6 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	21.93 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	27.1	24.4	24.1	23.5
% of Population 18 - 64	66.1	63.2	62.7	63
% of Population 65 and over	6.8	12.4	13.2	13.5

Table GC.10-4 illustrates how Logan Township ranks in the county, the four county region, and New Jersey.

Table GC.10-4: Logan Township Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	15	44	343
Land Area Rank	3	23	119
Population Density Rank	22	67	484
Population Change Rank	16	53	-

Table GC.10-5 includes information related to economic and housing statistics for Logan Township, Gloucester County, the four county region, and New Jersey.

Table GC.10-5: Logan Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Logan Township	Gloucester County	Region	New Jersey
Date Incorporated	March 7, 1877	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$87,209	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	2,172	109,796	397,990	3,529,033
Occupied Housing Units	2,087	104,271	372,472	3,176,069
Vacant Housing Units	85	5,525	25,518	352,964
Owner Occupied Housing Units	1,935	83,525	266,593	2,126,279
Renter occupied Housing Units	152	20,746	105,879	1,049,790
Building Permits	6	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

Part 3: Hazard Identification and Risk Assessment

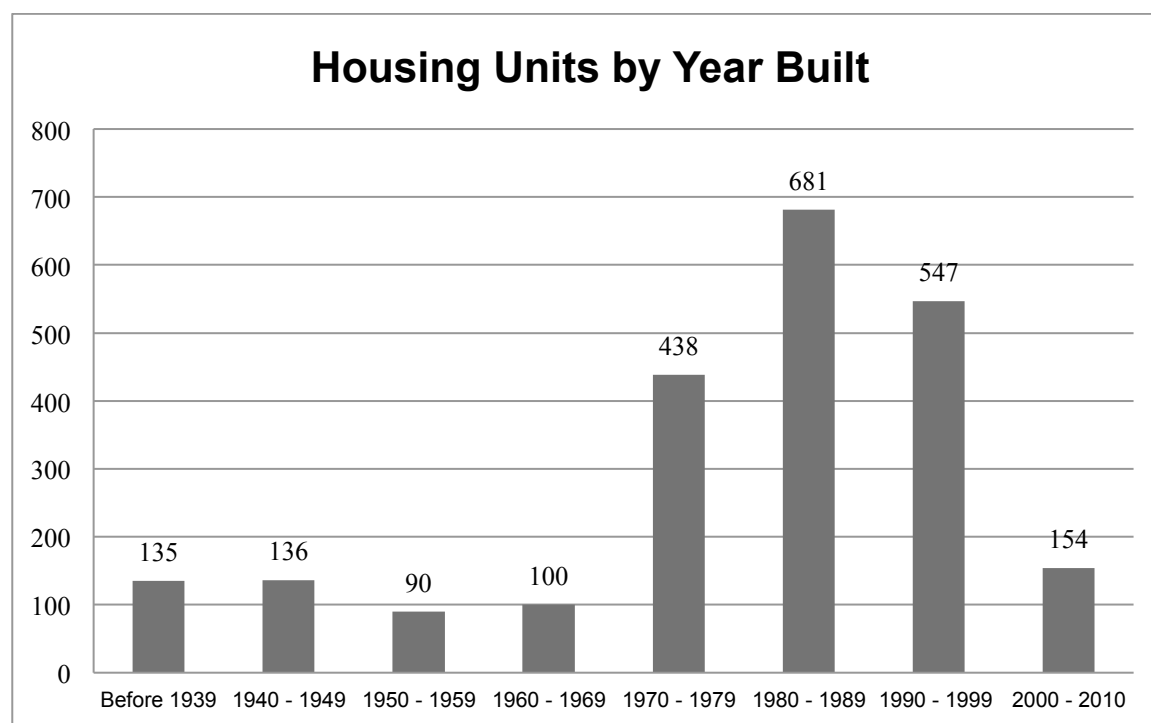
Table GC.10-6 illustrates how Logan Township ranks in the county and the four county region.

Table GC.10-6: Logan Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	6	9
Vacant Housing Rank	18	62
Renter Occupied Housing Rank	20	71
Building Permits Rank	14	47

Figure GC.10-3 illustrates development patterns in Logan Township by examining housing units by year built. Nearly a third of the homes in Logan Township were built during the 1980s.

Figure GC.10-3: Logan Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- High Wind

Moderate Priority

- Coastal Erosion and Sea Level Rise
- Flood
- Levee Failure

Low Priority

- Drought
- Earthquake
- Extreme Temperature: Cold & Hot
- Severe Weather – Summer
- Severe Weather – Winter

Three additional hazards were considered but were not considered applicable to the municipality:

- Dam Failure
- Geologic Hazards
- Wildfire

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3: Hazard Identification and Risk Assessment

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.10-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.10-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge)	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where inundation due to storm surge may occur
Table RP.D-81	Levee Failure	Levee Inventory	Provide information about levee configuration
Figure RP.D-85	Levee Failure	Levee Locations	Identify locations of levees in and around the municipality

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.10-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.10-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.10-8: Logan Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Township Hall	Municipal	Administrative Offices	125 Main Street, Bridgeport		N	Y ²		M-5
CF-2	Emergency Operations Center	EOC	Co-located Facilities	125 Main Street, Bridgeport	CF-1	N	Y ³		
CF-3	Police Station	Law Enforcement Facilities	Stations	125 Main Street, Bridgeport	CF-1	N	Y		
CF-4	Logan #1 Fire Station	FireStations	Stations	4 Steelman Avenue, Bridgeport		Y	Y		
CF-5	Logan #2 Fire Station	FireStations	Stations	415 Beckett Road, Swedesboro		N	N		M-8
CF-6	Municipal Utility Authority Facilities	Utilities – Wastewater	Combined Administrative Office / Treatment Plant	69 Jefferson Lane, Bridgeport		N/A	Y ⁴	Jefferson Lane subject to flooding	M-11, M-12
CF-7	Wastewater Lift Station #2	Utilities – Wastewater	Pump Stations / Lift Stations			N/A	N		M-9
CF-8	Wastewater Lift Station #8	Utilities – Wastewater	Pump Stations / Lift Stations			N/A	N		M-10
CF-9	Center Square Elementary School	Schools	Public Schools	100 Peachwood Drive, Logan		Y	Y ⁵	Back-up shelter location	M-7
CF-10	Logan Elementary School	Schools	Public Schools	110 School Lane, Logan		Y	Y ⁵	Primary Shelter	M-6
CF-11	Beckett Christian Preschool	Vulnerable Populations Facilities	Private Child Day Care	1566 Center Square Road, Bridgeport			N	Capacity = 110 children	
CF-12	Kiddie Garden Preschool	Vulnerable Populations Facilities	Private Child Day Care	510 Heron Drive, Suite 112, Bridgeport			N	Capacity = 170 children	
CF-13	Kinder Care Learning Center	Vulnerable Populations Facilities	Private Child Day Care	1603 Center Square Road, Bridgeport			N	Capacity = 110 children	
CF-14	Goddard School	Vulnerable Populations Facilities	Private Child Day Care	553 Beckett Road, Bridgeport			N	Capacity = 120 children	

² Existing generator can provide back-up power for approximately 50% of Township Hall.

³ Existing generator can provide back-up power for all EOC functions.

⁴ Existing fuel storage is inadequate for power outages affecting large areas and availability of fuel supplies from vendors.

⁵ Existing generators are limited to emergency lighting.

Part 3: Hazard Identification and Risk Assessment

Table GC.10-9: Logan Township (Gloucester County) Critical Facilities Hazard Exposure⁶

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Township Hall	N/A	N/A	N/A	N/A									N/A	N/A
CF-2	Emergency Operations Center	N/A	N/A	N/A	N/A									N/A	N/A
CF-3	Police Station	N/A	N/A	N/A	N/A									N/A	N/A
CF-4	Logan #1 Fire Station	N/A	N/A	N/A	N/A									N/A	N/A
CF-5	Logan #2 Fire Station	N/A	N/A	N/A	N/A									N/A	N/A
CF-6	Municipal Utility Authority Facilities	N/A	N/A	N/A	N/A									N/A	N/A
CF-7	Wastewater Lift Station #2	N/A	N/A	N/A	N/A									N/A	N/A
CF-8	Wastewater Lift Station #8	N/A	N/A	N/A	N/A									N/A	N/A
CF-9	Center Square Elementary School	N/A	N/A	N/A	N/A									N/A	N/A
CF-10	Logan Elementary School	N/A	N/A	N/A	N/A									N/A	N/A
CF-11	Beckett Christian Preschool	N/A	N/A	N/A	N/A									N/A	N/A
CF-12	Kiddie Garden Preschool	N/A	N/A	N/A	N/A									N/A	N/A
CF-13	Kinder Care Learning Center	N/A	N/A	N/A	N/A									N/A	N/A
CF-14	Goddard School	N/A	N/A	N/A	N/A									N/A	N/A

⁶ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as initial risk reduction efforts
- Continue efforts to improve levels of protection from tidal inundation and flooding along the Delaware River and Repaupo Creek levees including resolve operation and management of Birch Creek tide gate
- Address exacerbating effects of beaver dams on tidal inundation and flooding
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.10-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.10-10.

Table GC.10-10: Status of Logan Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Logan 1: Repaupo Fire Station (shelter) generator/ back-up power.	Not completed. Station is no longer operational.		N/A
Logan 2: Beckett Fire Station (shelter) generator/ back-up power.	Not completed, not funded.	Beckett Road Fire Station is not used as a shelter; the Steelman Avenue Fire Station is used as a shelter and has an adequate generator. Mitigation measure modified and included in updated Municipal Appendix.	M-8
Logan 3: Address recurring erosion/instability issue at Delaware River/ Repaupo Creek levee (end of Floodgate Road).	On-going.	Problem areas were partially addressed by joint action with Greenwich Township, Gloucester County Engineering Department, USACE, and FEMA. Levee floodgate and portion of levee replaced but proposed increased levee height was not implemented along the entire levee length. Multi-jurisdictional mitigation measure included in updated Municipal Appendix.	MJ-1

Table GC.10-10 Notes:

- A. See Tables GC.10-11 and GC.10-12 for municipal (M-#) mitigation measures
- B. See Table GC.10-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.10-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Table GC.10-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.10-4.

Table GC.10-11: Logan Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Flood	Goal #2	Existing
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-5	Upgrade backup emergency power generator at Township Hall located at 125 Main Street (CF-1).	All	Goal #4	Existing

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-6	Upgrade backup emergency power generator at Logan Elementary School (primary shelter) located at 110 School Lane (CF-10).	All	Goal #4	Existing
M-7	Upgrade backup emergency power generator at Center Square Elementary School (backup shelter) located at 100 Peachwood Drive (CF-9).	All	Goal #4	Existing
M-8	Install backup emergency power generator at Logan Fire Station #2 located at 415 Beckett (CF-5).	All	Goal #4	Existing
M-9	Install backup emergency power generator at Wastewater Pump Station #2 (CF-7).	All	Goal #4	Both
M-10	Install backup emergency power generator at Wastewater Pump Station #8 (CF-8).	All	Goal #4	Both
M-11	Increase fuel storage capacity at Wastewater Treatment Plant (CF-6).	All	Goal #4	Both
M-12	Resolve flooding at Jefferson Lane access road to Wastewater Treatment Plant (CF-6).	Flood	Goal #4	Both
M-13	Address identified Repetitive Flood Loss Properties.	Flood	Goal #4	Existing

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.10-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria²
- Project Type to help determine funding options and implementation mechanisms at the municipal level³
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

² See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

³ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

Table GC.10-12: Logan Township (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Low	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> Work with County Working Group to identify resource needs and availability. Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Low	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	Low	Data Acquisition and Management	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.
M-5	Upgrade backup emergency power generator at Township Hall located at 125 Main Street (CF-1).	Municipal OEM	High	Back-up Emergency Power Generator	< \$100K	One year	Conduct project scoping.
M-6	Upgrade backup emergency power generator at Logan Elementary School (primary shelter) located at 110 School Lane (CF-10).	School Board	Moderate	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-7	Upgrade backup emergency power generator at Center Square Elementary School (backup shelter) located at 100 Peachwood Drive (CF-9).	School Board	Moderate	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-8	Install backup emergency power generator at Logan Fire Station #2 located at 415 Beckett (CF-5).	Fire Department	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-9	Install backup emergency power generator at Wastewater Pump Station #2 (CF-7).	Municipal Utility Authority	Low	Back-up Emergency Power Generator	\$25K ⁴	Three to five years	Conduct project scoping.

⁴ Cost estimate provided by Municipal Working Group.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-10	Install backup emergency power generator at Wastewater Pump Station #8 (CF-8).	Municipal Utility Authority	High	Back-up Emergency Power Generator	\$50K ⁵	Three to five years	Conduct project scoping.
M-11	Increase fuel storage capacity at Wastewater Treatment Plant (CF-6).	Municipal Utility Authority	High	Back-up Emergency Power Fuel Supply	< \$100K	Three to five years	Conduct project scoping.
M-12	Resolve flooding at Jefferson Lane access road to Wastewater Treatment Plant (CF-6).	Municipal Utility Authority	High	Public Property Flood Mitigation	\$500K ⁶	Three to five years	Conduct project scoping.
M-13	Address identified Repetitive Flood Loss Properties.	Floodplain Administrator	Moderate	Private Property Flood Mitigation	Staff time commitment	Six months	Prior to initiating landowner contacts, identify flood insurance implications and mitigation options including eligible activities per FEMA HMA programs.

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.10-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.10-4.

⁵ Cost estimate provided by Municipal Working Group.

Part 4: Mitigation Measures

Table GC.10-13: Logan Township (Gloucester County) Multi-Jurisdictional Mitigation Measures

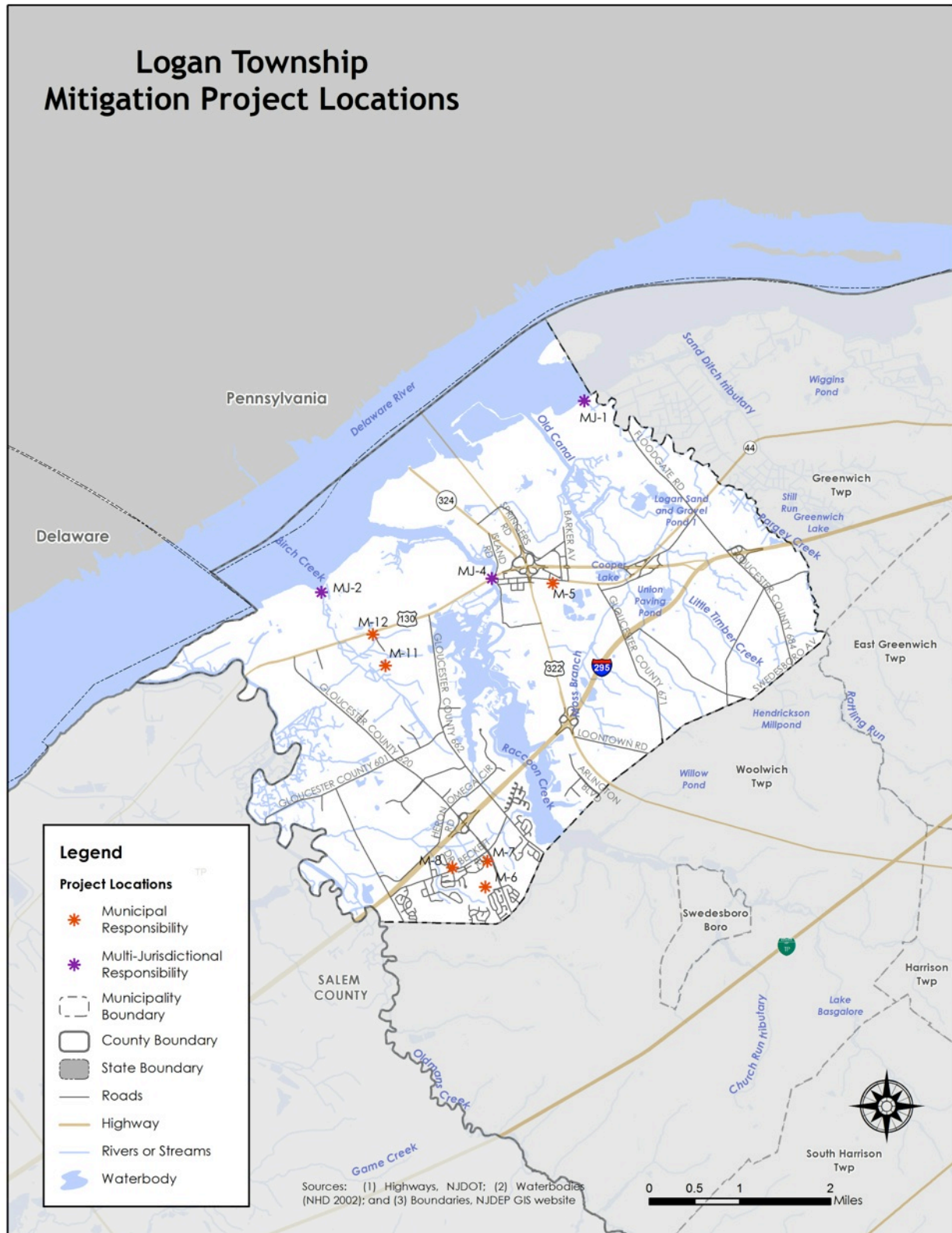
#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Address recurring erosion / instability issue at Delaware River/ Repaupo Creek levee (end of Floodgate Road).	Coastal Erosion and Sea Level Rise, Flood	Goal #4	Both	Municipal OEM, Greenwich Township, Gloucester County Engineering Department, NJDEP, FEMA, USACE.	To be determined ⁶
MJ-2	Birch Creek Tide Gate operation and maintenance. ⁷	Coastal Erosion and Sea Level Rise, Levee Failure	Goal #4	Both	Municipal OEM, Gloucester County Engineering Department, NJDEP, FEMA, USACE.	To be determined ⁷
MJ-3	Beaver management program.	Coastal Erosion and Sea Level Rise, Flood	Goal #4	Both	Municipal OEM, NJDEP	To be determined ⁷
MJ-4	NJ Route 130 Inundation.	Coastal Erosion and Sea Level Rise, Flood	Goal #4	Both	Municipal OEM, NJDOT	To be determined ⁷

⁶ Pending discussion with Gloucester County Working Group.

⁷ Project history includes: Birch Creek Meadow Association (recently dissolved) initial construction, maintenance, and operation of levee and tide gates; NJDEP and/or USACE permitted dredging of creek but no longer allow; and installation of \$0.5 million pump station but private property owner(s) have not taken responsibility for electric service (annual cost estimated at \$50K). In addition, the ownership of the channel is not clear.

Part 4: Mitigation Measures

Figure GC.10-4: Logan Township Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Logan Township Emergency Operations Plan (2012)
- Logan Township Unified Development Ordinance (2010)
- Logan Township Master Plan (2010)
- Logan Township Zoning Map (2010)
- Logan Township Environmental Resource Inventory (2004)
- Logan Township 2014 Capital Improvement Budget and Capital Improvement Program

Attachment A: Public Review Comments

The following comments were received during the public review of the Logan Township Municipal Appendix:

Table GC.10.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Logan Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.11
Mantua Township, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.11-i
Part 1 Overview	GC.11-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.11-1
1.2: Mantua Township (Gloucester County) Municipal Appendix	GC.11-1
Part 2 Participation	GC.11-2
2.1: Municipal Working Group Participation	GC.11-2
2.2: Public Participation	GC.11-4
Part 3 Hazard Identification and Risk Assessment	GC.11-5
3.1: Municipal Profile	GC.11-5
3.2: Hazard Priorities	GC.11-9
3.3: Hazard Mapping	GC.11-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.11-11
Part 4 Mitigation Measures	GC.11-15
4.1: Mitigation Goals and Strategy	GC.11-15
4.2: SDVR HMP Mitigation Measures	GC.11-16
4.3: Municipal Mitigation Measures – Identification	GC.11-17
4.4: Municipal Mitigation Measures – Implementation	GC.11-18
4.5: Multi-Jurisdictional Mitigation Measures	GC.11-20
4.6: Plan Review and Integration	GC.11-22

Table of Contents

List of Figures

Figure GC.11-1: Mantua Township (Gloucester County) Location Map	GC.11-5
Figure GC.11-2: Mantua Township Base Map	GC.11-6
Figure GC.11-3: Mantua Township Housing Units by Year Built	GC.11-8
Figure GC.11-4: Mantua Township Mitigation Project Locations	GC.11-21

List of Tables

Table GC.11-1: Mantua Township (Gloucester County) Working Group	GC.11-2
Table GC.11-2: Public Participation	GC.11-4
Table GC.11-3: Mantua Township Demographics	GC.11-7
Table GC.11-4: Mantua Township Demographic Rankings	GC.11-7
Table GC.11-5: Mantua Township Economics and Housing	GC.11-7
Table GC.11-6: Mantua Township Ranking (Economics and Housing)	GC.11-8
Table GC.11-7: Supporting Mapping and Exhibits	GC.11-10
Table GC.11-8: Mantua Township Critical Facilities Inventory	GC.11-12
Table GC.11-9: Mantua Township Critical Facilities Hazard Exposure	GC.11-14
Table GC.11-10: Status of Mantua Township SDVR HMP Mitigation Measures	GC.11-16
Table GC.11-11: Mantua Township Municipal Mitigation Measures Identification	GC.11-17
Table GC.11-12: Mantua Township Municipal Mitigation Measures Implementation	GC.11-18
Table GC.11-13: Mantua Township Multi-Jurisdictional Mitigation Measures	GC.11-20

Attachments

Attachment GC.11.A: Public Review Comments	GC.11.A-1
Attachment GC.11.B: Adoption Resolution	GC.11.B-1
Attachment GC.11.C: Approval Letter	GC.11.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Mantua Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Mantua Township in Gloucester County, New Jersey.

The Mantua Township Municipal Working Group recommended the Mantua Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Mantua Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.11-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.11-1: Mantua Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Brian	Grady	Mantua Township Police Department	Emergency Management Coordinator / Floodplain Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Gayle	Tschopp	Mantua Township Finance Department	CFO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Pamela	LeVine	Mantua Township Public Works / Mantua Township Clerk's Office	Public Works Secretary / Registrar / Deputy Clerk	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Michael	Datz	Mantua Township Public Works	Superintendent of Public Works	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Rodney J.	Sawyer	Mantua Township Police Department	Chief of Police	<input checked="" type="checkbox"/>		
Brian	Hauss	Mantua Township Fire District No. 1	Fire Chief	<input checked="" type="checkbox"/>		

¹ Round 1 Work Session was held on August 12, 2014.

² Round 2 Work Session was held on October 27, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.11-1.

Part 2: Participation

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Elected Officials
- Land Use / Economic Development Planner
- Building Code Official
- Engineering
- Community / Faith-Based Organizations
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Emergency Medical Services
- Business Associations
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Major Employers and Business
- Healthcare Institutions

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.11-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.11-2: Public Participation

Date	Type of Involvement	Location
August 20, 2014	Link to Project Website (http://nj4hmp.com) established	Mantua Township, Gloucester County ⁵
August 20, 2014	Flyers posted	Mantua Township Clerk's Office
December 18, 2014	Preliminary Municipal Appendix posted to website for public comment	Mantua Township, Gloucester County ⁵
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁶ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁷

⁵ <http://www.mantuatownship.com/>

⁶ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁷ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

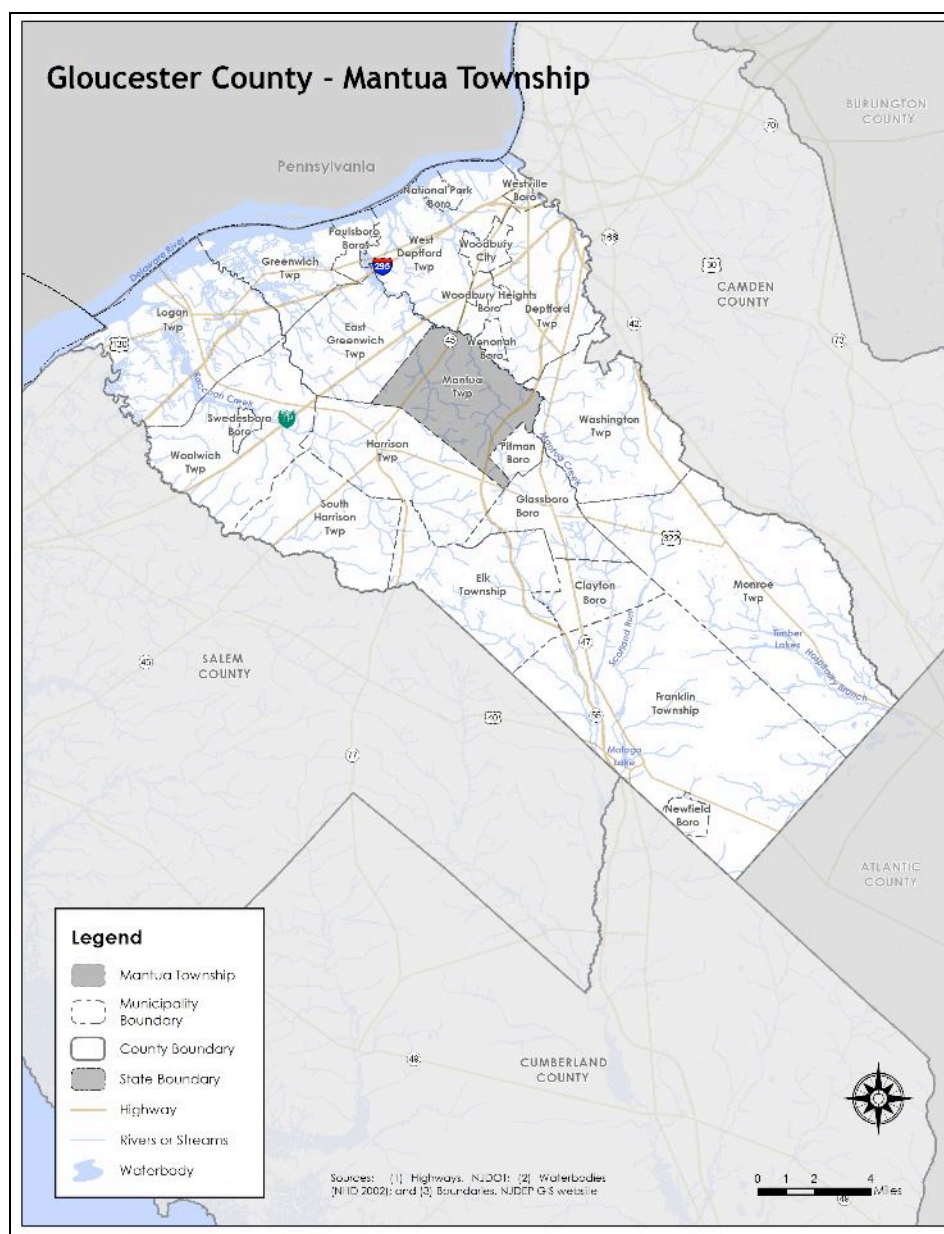
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Mantua Township is located in the central part of Gloucester County (See Figure GC.11-1).

Figure GC.11-1: Mantua Township (Gloucester County) Location Map

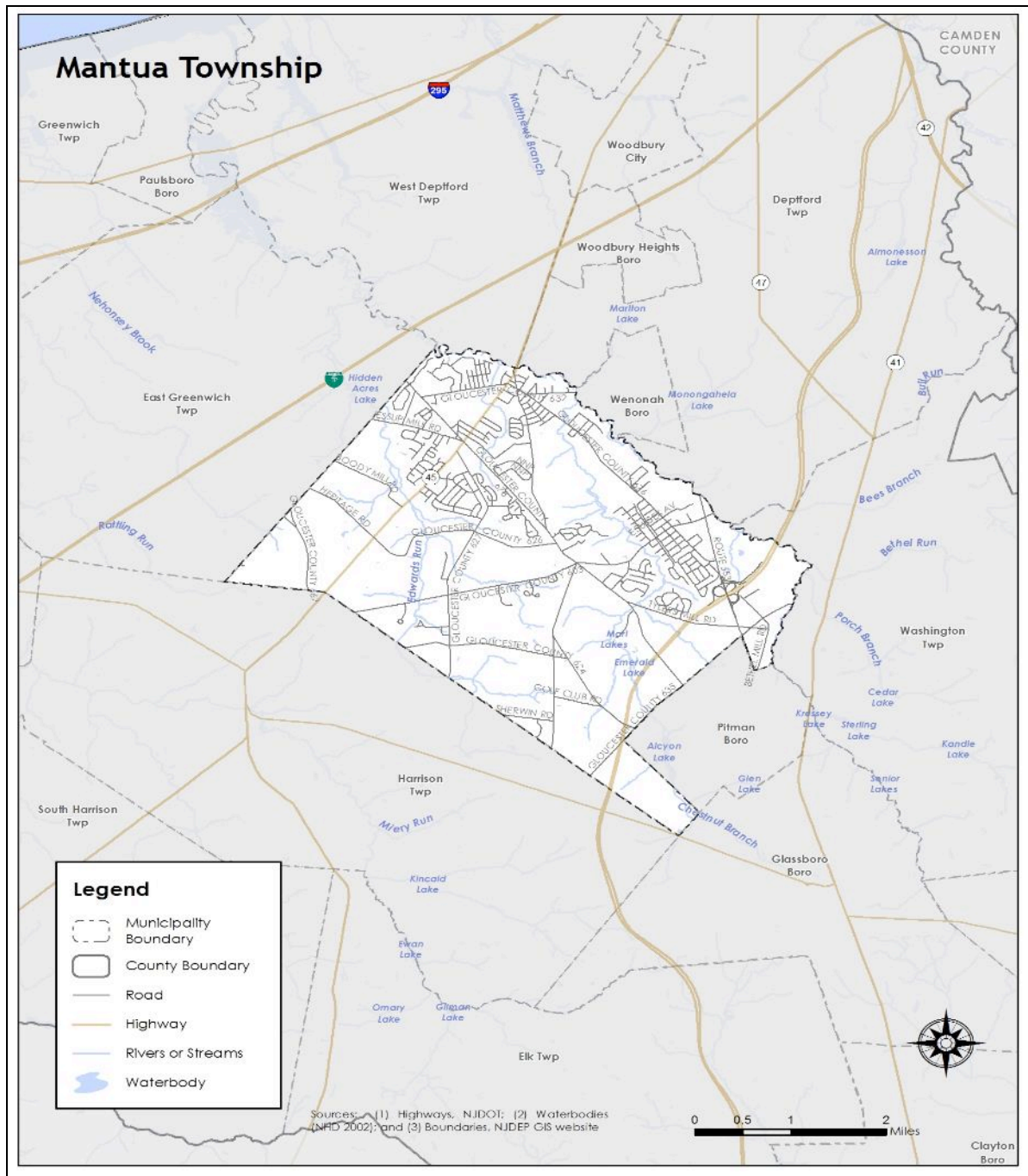


Part 3: Hazard Identification and Risk Assessment

Mantua Township is a rural community with residential areas including high-density housing clusters. Unincorporated communities in the municipality are Barnsboro, and Sewell.

Per Figure GC.11-2, the major watercourses include Mantua Creek, Chestnut Branch, Edwards Run, and Marl Lakes. Major transportation routes include State Highways 45 and 55, and Gloucester County Routes 553 (Woodbury-Glassboro Road), 667 (Mantua Boulevard) 667 (Cohawkin Road), and 678 (Berkley Road). The land is gently rolling.

Figure GC.11-2: Mantua Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.11-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.11-3: Mantua Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Mantua Township	Gloucester County	Region	New Jersey
2000 Population	14,217	254,673	974,328	8,414,350
2010 Population	15,217	288,288	1,024,926	8,791,894
Percent Change	7.03%	13.2%	5.19%	4.49%
Population Density	960.1 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	15.85 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	24.1	24.4	24.1	23.5
% of Population 18 - 64	63.1	63.2	62.7	63
% of Population 65 and over	12.8	12.4	13.2	13.5

Table GC.11-4 illustrates how Mantua Township ranks in the county, the four county region, and New Jersey.

Table GC.11-4: Mantua Township Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	7	17	165
Land Area Rank	9	35	162
Population Density Rank	14	51	388
Population Change Rank	12	24	-

Table GC.11-5 includes information related to economic and housing statistics for Mantua Township, Gloucester County, the four county region, and New Jersey.

Table GC.11-5: Mantua Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Mantua Township	Gloucester County	Region	New Jersey
Date Incorporated	February 23, 1853	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$80,743	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	5,980	109,796	397,990	3,529,033
Occupied Housing Units	5,719	104,271	372,472	3,176,069
Vacant Housing Units	261	5,525	25,518	352,964
Owner Occupied Housing Units	5,167	83,525	266,593	2,126,279
Renter occupied Housing Units	552	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Mantua Township	Gloucester County	Region	New Jersey
Building Permits	0	716	1,554	13,535
Largest Industry	Educational Services, health care and social assistance, and industries not classified	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

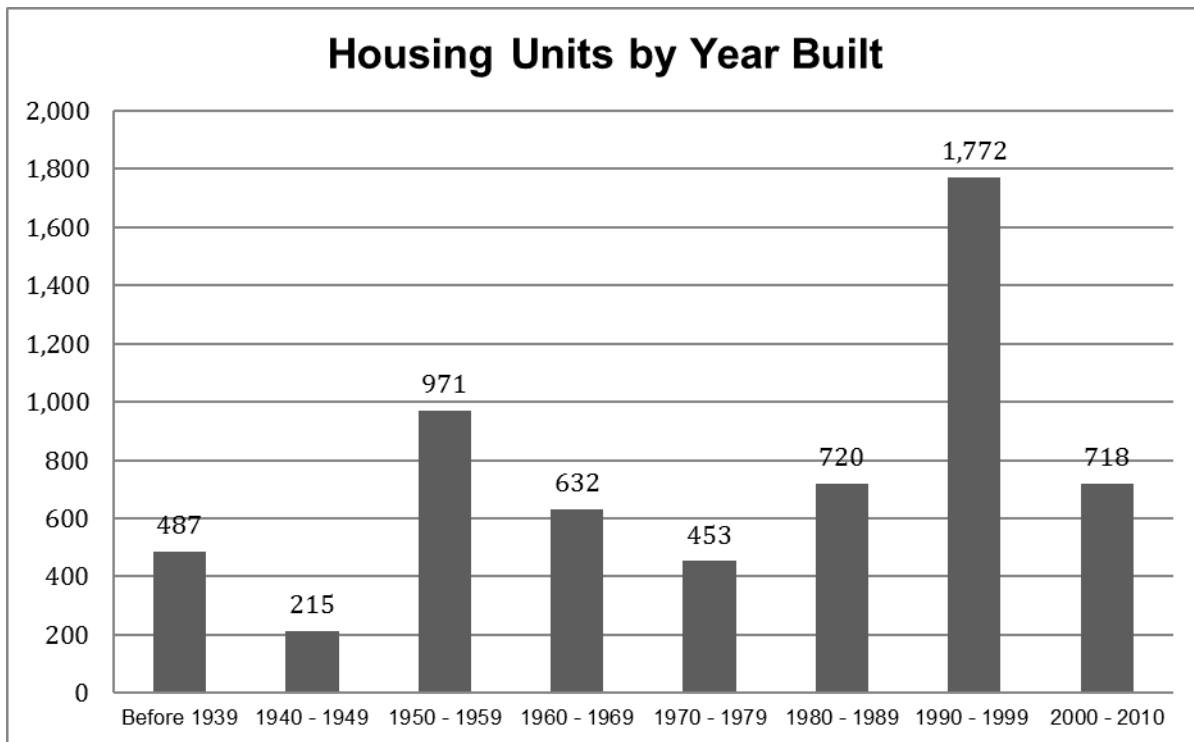
Table GC.11-6 illustrates how Mantua Township ranks in the county and the four county region.

Table GC.11-6: Mantua Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	8	16
Vacant Housing Rank	7	24
Renter Occupied Housing Rank	12	41
Building Permits Rank	21	84

Figure GC.11-3 illustrates development patterns in Mantua Township by examining housing units by year built. About 30% of homes in Mantua Township were built during the 1990s.

Figure GC.11-3: Mantua Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- None

Moderate Priority

- Flood
- High Wind

Low Priority

- Dam Failure
- Drought
- Earthquake
- Extreme Temperature: Cold & Hot
- Levee Failure
- Severe Weather – Summer
- Severe Weather – Winter
- Wildfire

Two additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3: Hazard Identification and Risk Assessment

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.11-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.11-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Table RP.D-81	Levee Failure	Levee Inventory	Provide information about levee configuration
Figure RP.D-85	Levee Failure	Levee Locations	Identify locations of levees in and around the municipality
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.11-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.11-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.11-8: Mantua Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Municipal Building	Municipal	Administrative Offices	401 Main Street, Mantua	CF-7	N	N		
CF-2	Emergency Operations Center	EOC	Co-located Facilities	155 East Union Avenue, Sewell	CF-5	N	Y		
CF-3	Police Station	Law Enforcement Facilities	Stations	405 Main Street, Mantua		N	Y	Includes a holding cell	
CF-4	Mantua Fire District 1	FireStation	Stations	191 Jackson Road, Mantua		N	N		M-5
CF-5	Mantua Volunteer Fire Department	FireStation	Stations	155 Union Avenue, Sewell	CF-2	N	Y		
CF-6	Public Works	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	407 Main Street, Mantua		N	N ²		M-6
CF-7	Mantua Township Municipal Utilities Authority	Utilities – Water and Sewer	Administrative Offices	397 Main Street, Mantua	CF-1	N/A	N		
CF-8	Water Tower	Utilities – Water	Water Towers	653 Main Street, Mantua		N/A	Y	Portable generator	
CF-9	Water Tower	Utilities – Water	Water Towers	49A Candlewood Drive, Mantua		N/A	N		
CF-10	Gloucester County Christian School	Schools	Private Schools	151 Golf Club Road, Sewell		N	N		
CF-11	Centre City Elementary School	Schools	Public Schools	301 Columbus Drive, Mantua		N	Y		
CF-12	J. Mason Tomlin Elementary School	Schools	Public Schools	393 Main Street, Mantua		Y	Y		
CF-13	Sewell Elementary School	Schools	Public Schools	40 McAnally Drive, Sewell		N	Y		
CF-14	Bright Beginnings West School	Schools	Private Child Day Care	536 Lambs Road, Sewell		N	N		
CF-15	Kiddie Korral	Vulnerable Populations Facilities	Private Child Day Care	672 Main Street, Sewell		N	N		

² Grant funding requested through Superstorm Sandy for backup power generator for the Public Works Facility.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-16	Senior Center	Vulnerable Populations Facilities	Senior Center	111 Mercer Avenue, Sewell		Y	N	Temporary shelter	M-7

Part 3: Hazard Identification and Risk Assessment

Table GC.11-9: Mantua Township (Gloucester County) Critical Facilities Hazard Exposure³

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Township Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-3	Police Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-4	Mantua Fire District 1	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-5	Mantua Volunteer Fire Department	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-6	Public Works	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-7	Municipal - Utilities Authority	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-8	Water Tower	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-9	Water Tower	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-10	Gloucester County Christian School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-11	Centre City Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-12	J. Mason Tomlin Elementary School1	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-13	Sewell Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-14	Bright Beginnings West School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-15	Kiddie Korral	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			
CF-16	Senior Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A			

³ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures, in particular for repetitive flood loss properties
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.11-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.11-10.

Table GC.11-10: Status of Mantua Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Mantua 1: Engineering study to assess risk of dam located on Lambs Road and bordering Washington Township.	Completed	Issue was resolved. County updated dam facility within the last five years. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Mantua 2: Engineering study to determine appropriate flood mitigation action for Route 45.	Not completed, not funded	Multi-jurisdictional mitigation measure included in updated Municipal Appendix.	MJ-2
Mantua 3: Engineering study to determine appropriate flood mitigation action for private houses located on Hickory Avenue next to Mantua Creek.	Not completed, not funded	Mitigation measure included in updated Municipal Appendix.	M-9
Mantua 4: Engineering study to determine appropriate flood mitigation action for police and data storage facility located on Main Street.	Completed	Issue was resolved through 2011 grant funds. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Mantua 5: Relocate utility lines underground in the southern end of Mantua from Route 45 to Break Neck Road.	Not completed, not funded	Issue is not considered valid. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Mantua 6: Engineering study to determine appropriate flood mitigation action of Water Facility (Harrison Township Waste Water Treatment Facility) located on Woodland Avenue).	Not completed, not funded	Issue is not considered valid. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A

Table GC.11-10 Notes:

- A. See Tables GC.11-11 and GC.11-12 for municipal (M-#) mitigation measures
- B. See Table GC.11-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.11-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Table GC.11-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.11-4.

Table GC.11-11: Mantua Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.²	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #2	Existing
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-5	Install permanent backup emergency power generator at Fire Station (CF-4).	All	Goal #4	Both
M-6	Install permanent backup emergency power generator at Public Works Facility (CF-6). ³	All	Goal #4	Both
M-7	Install backup emergency power generator at Senior Center (CF-16).	All	Goal #4	Both
M-8	Upgrade water / sewer system in Mantua Township city center area.	Flood	Goal #4	Both
M-9	Engineering study to determine appropriate flood mitigation action for houses located on Hickory Avenue next to Mantua Creek.	Flood	Goal #4	Both
M-10	Address identified Repetitive Flood Loss Properties.	Flood	Goal #4	Both

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.11-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria⁴
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁵
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.11-12: Mantua Township (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Low	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).

³ Project included in Letter of Interest (LOI) for DR 4086 HMGP. LOI project #1860 budget = \$25,000.00.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁵ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Low	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM, Public Works Department, and Municipal Working Group	Low	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.
M-5	Install backup emergency power generator at Fire Station (CF-4).	Municipal OEM and Public Works Department	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-6	Install permanent backup emergency power generator at Public Works Facility (CF-6). ⁶	Municipal OEM and Public Works Department	Moderate	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-7	Install backup emergency power generator at Senior Center (CF-16).	Municipal OEM and Public Works Department	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-8	Upgrade water / sewer system in Mantua Township city center area.	Municipal OEM and Public Works Department	Moderate	Public Property Flood Mitigation	\$100K – \$1M	Three to five years	Conduct project scoping.
M-9	Engineering study to determine appropriate flood mitigation action for houses located on Hickory Avenue next to Mantua Creek.	Municipal OEM and Public Works Department	Moderate	Private Property Flood Mitigation	\$50K	Three to five years	Conduct project scoping.
M-10	Address identified Repetitive Flood Loss Properties.	Floodplain Administrator	Moderate	Private Property Flood Mitigation	Staff time commitment	Six months	Prior to initiating landowner contacts, identify flood insurance implications and mitigation options including eligible activities per FEMA HMA programs.

⁶ Project included in Letter of Interest (LOI) for DR 4086 HMGP. LOI project #1860 budget = \$25,000.00.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.11-13.

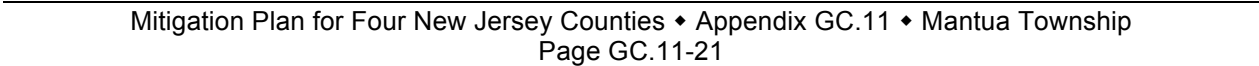
Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.11-4.

Table GC.11-13: Mantua Township (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Alleviate flooding at County Route 553 (Glassboro Road) to include retention system at stream crossing bridge.	Flood	Goal #4	Both	Municipal OEM, Mantua Township DPW, Deptford Township DPW, and Gloucester County DPW	Low
MJ-2	Alleviate flooding on New Jersey Route 45 100 yards north of Barry Drive.	Flood	Goal #4	Both	Municipal OEM, NJDOT	Moderate
MJ-3	Upgrade storm drainage pipes at County Route 603 (Atlantic Avenue) and Livingstone Road.	Flood	Goal #4	Existing	Municipal OEM, Public Works Department	Low



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan – Base Plan (2013)
- Floodplain Ordinance (2009)⁷
- Master Plan (2006) and Reexamination Plans (2011 and 2012)
- Land Use and Development Codes⁸
- Stormwater Management Plan (2006)⁹
- Zoning Map (2006)¹⁰
- Capital Improvement Budget (2014)¹¹

⁷ <http://www.ecode360.com/9575451#9575451>

⁸ <http://www.ecode360.com/9577793#9577793>

⁹ <http://www.ecode360.com/9579731#9579731>

¹⁰ <http://www.mantuatownship.com/wp-content/uploads/2013/09/ZONING-MAP.pdf>

¹¹ <http://www.mantuatownship.com/wp-content/uploads/2014/05/2014-Municipal-Budget.pdf>

Attachment A: Public Review Comments

The following comments were received during the public review of the Mantua Township Municipal Appendix:

Table GC.11.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Mantua Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.12
Monroe Township, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.12-i
Part 1 Overview	GC.12-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.12-1
1.2: Monroe Township (Gloucester County) Municipal Appendix	GC.12-1
Part 2 Participation	GC.12-2
2.1: Municipal Working Group Participation	GC.12-2
2.2: Public Participation	GC.12-4
Part 3 Hazard Identification and Risk Assessment	GC.12-5
3.1: Municipal Profile	GC.12-5
3.2: Hazard Priorities	GC.12-9
3.3: Hazard Mapping	GC.12-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.12-11
Part 4 Mitigation Measures	GC.12-16
4.1: Mitigation Goals and Strategy	GC.12-16
4.2: SDVR HMP Mitigation Measures	GC.12-17
4.3: Municipal Mitigation Measures – Identification	GC.12-18
4.4: Municipal Mitigation Measures – Implementation	GC.12-20
4.5: Multi-Jurisdictional Mitigation Measures	GC.12-22
4.6: Plan Review and Integration	GC.12-25

Table of Contents

List of Figures

Figure GC.12-1: Monroe Township (Gloucester County) Location Map	GC.12-5
Figure GC.12-2: Monroe Township Base Map	GC.12-6
Figure GC.12-3: Monroe Township Housing Units by Year Built	GC.12-8
Figure GC.12-4: Monroe Township Mitigation Project Locations	GC.12-24

List of Tables

Table GC.12-1: Monroe Township (Gloucester County) Working Group	GC.12-2
Table GC.12-2: Public Participation	GC.12-4
Table GC.12-3: Monroe Township Demographics	GC.12-7
Table GC.12-4: Monroe Township Demographic Rankings	GC.12-7
Table GC.12-5: Monroe Township Economics and Housing	GC.12-7
Table GC.12-6: Monroe Township Ranking (Economics and Housing)	GC.12-8
Table GC.12-7: Supporting Mapping and Exhibits	GC.12-10
Table GC.12-8: Monroe Township Critical Facilities Inventory	GC.12-12
Table GC.12-9: Monroe Township Critical Facilities Hazard Exposure	GC.12-14
Table GC.12-10: Status of Monroe Township SDVR HMP Mitigation Measures	GC.12-17
Table GC.12-11: Monroe Township Municipal Mitigation Measures Identification	GC.12-18
Table GC.12-12: Monroe Township Municipal Mitigation Measures Implementation	GC.12-20
Table GC.12-13: Monroe Township Multi-Jurisdictional Mitigation Measures	GC.12-22

Attachments

Attachment GC.12.A: Public Review Comments	GC.12.A-1
Attachment GC.12.B: Adoption Resolution	GC.12.B-1
Attachment GC.12.C: Approval Letter	GC.12.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Monroe Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Monroe Township in Gloucester County, New Jersey.

The Monroe Township Municipal Working Group recommended the Monroe Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Monroe Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.12-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.12-1: Monroe Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Frank	McLaughlin	Monroe Township Public Safety	Emergency Management Coordinator / Floodplain Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Frederick	Weikel	Monroe Township Public Safety	Zoning / Code Enforcement / OEM		<input checked="" type="checkbox"/>	
Salvatore	Tomarchio	Monroe Township Fire Prevention	Fire Official / Fire Marshal		<input checked="" type="checkbox"/>	
David S.	Sullivan	Operations – Monroe Township K-12 Schools	Director of Plant Operations		<input checked="" type="checkbox"/>	
David	Rosser	Private Business	Private Business Owner		<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on July 7, 2014.

² Round 2 Work Session was held on October 6, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.12-1.

Part 2: Participation

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Elected Officials
- IT Specialist
- Engineering
- Public Works
- Police
- Emergency Medical Services
- Community / Faith-Based Organizations
- Healthcare Institutions

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- Land Use / Economic Development Planner
- GIS Specialist
- Transportation Department Directors / Supervisors
- Business Associations
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Business Associations

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process

Table GC.12-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.12-2: Public Participation

Date	Type of Involvement	Location
September 30, 2014	Link to Project Website (http://nj4hmp.com) established	Monroe Township OEM webpage ⁵
October 7-8, 2014	Public outreach	Fire Prevention Displays and Open Houses
November 17, 2014	Link to Project Website (http://nj4hmp.com) established	Monroe Township Public Schools – Community ⁶
November 25, 2014	Preliminary Municipal Appendix posted to website for public comment	Monroe Township Announcements webpage ⁷
January 23, 2015	Flyers posted	Monroe Township facilities
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁸ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁹

⁵ <http://monroetownshipnj.org/2014/09/oem-hazard-mitigation-plan/>

⁶ www.monroetwp.k12.nj.us

⁷ <http://monroetownshipnj.org/2015/01/oem-hazard-mitigation-plan-community-participation/>

⁸ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁹ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

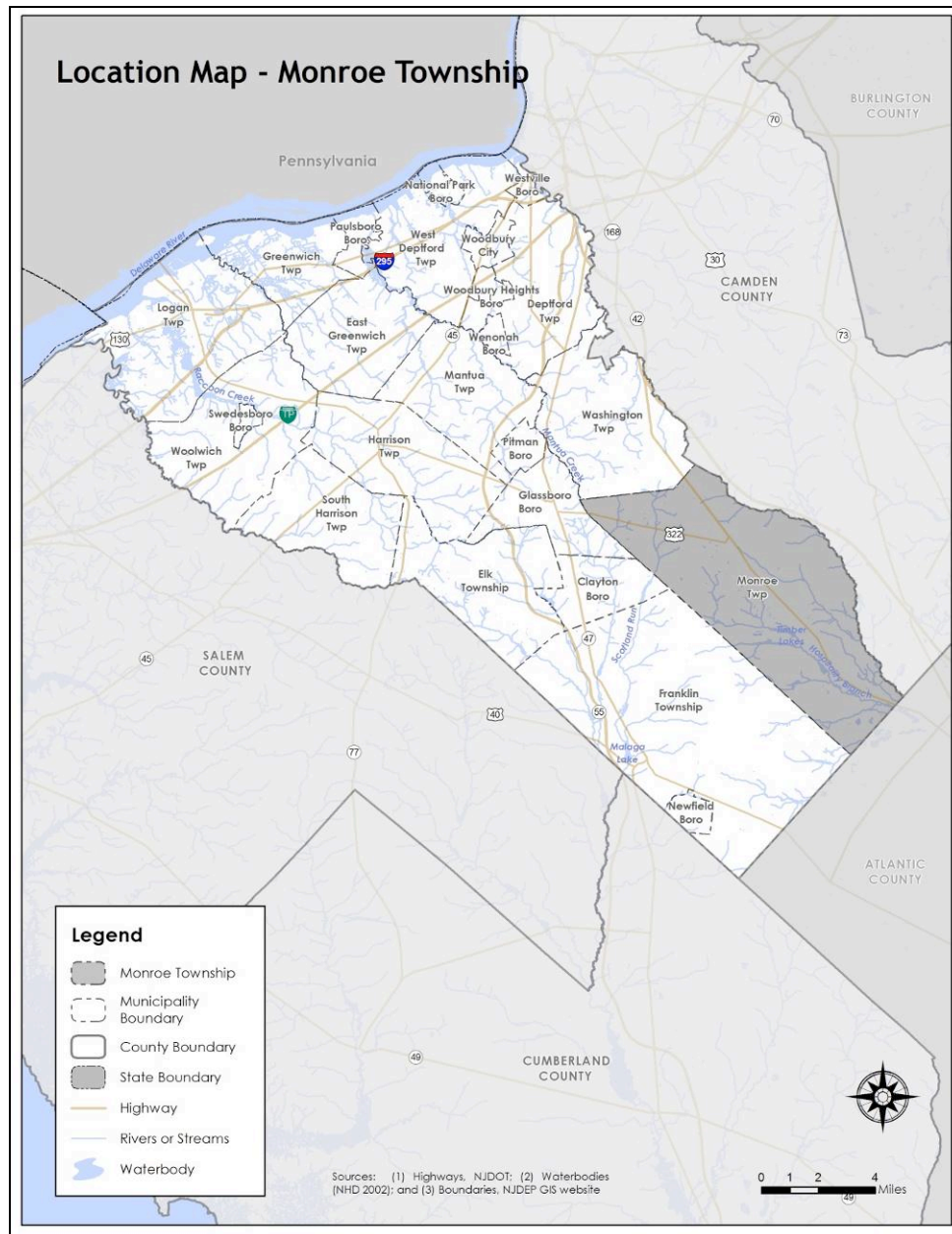
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Monroe Township is located in the eastern corner of Gloucester County (See Figure GC.12-1).

Figure GC.12-1: Monroe Township (Gloucester County) Location Map

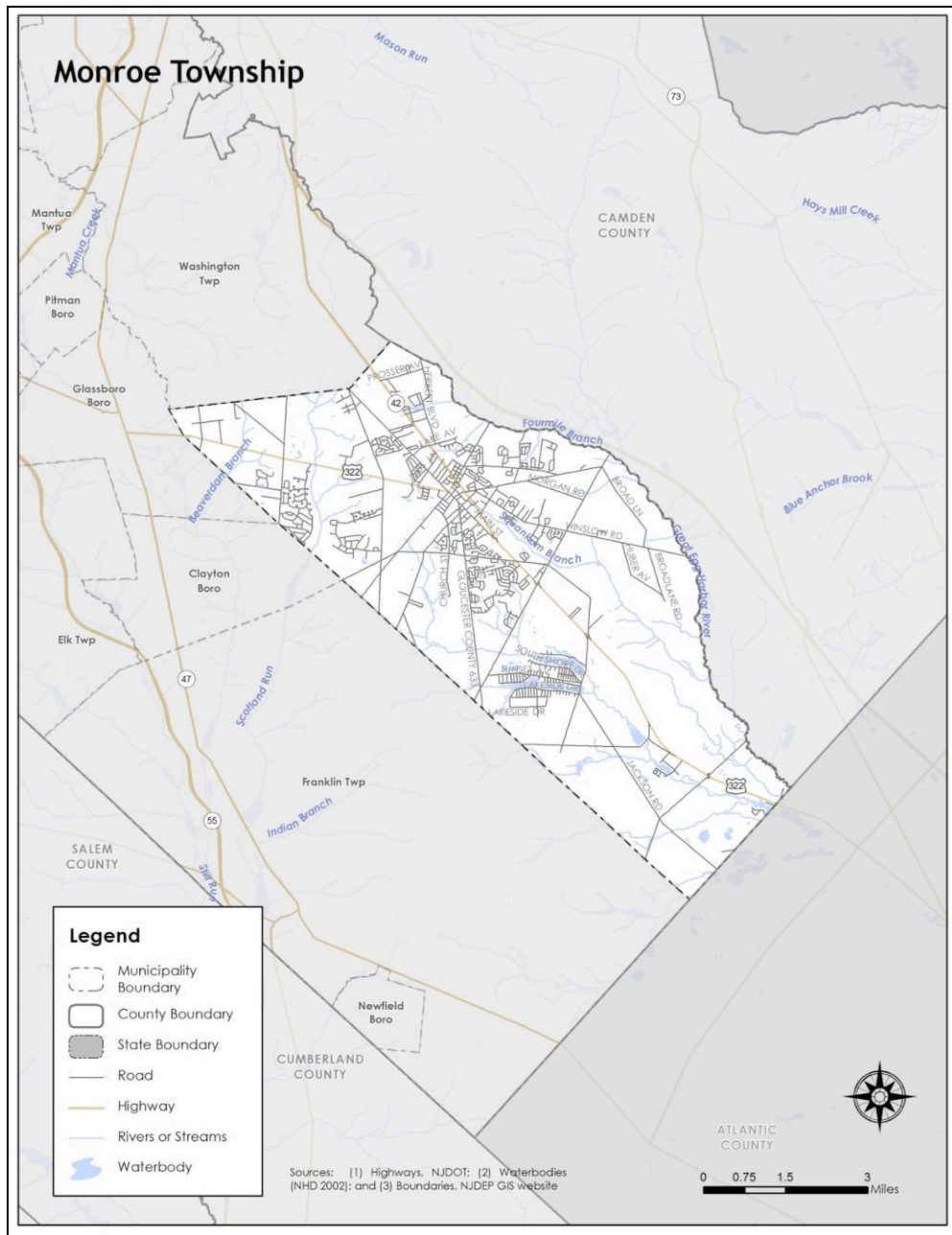


Part 3: Hazard Identification and Risk Assessment

Monroe Township is located in the northeast corner of Gloucester County in between the Philadelphia and Atlantic City Urban Areas. Unincorporated communities in the municipality include: Cross Keys, Downer, New Brooklyn, Robanna, Williamstown, and Cecil.

Per Figure GC.12-2, major water courses include Great Egg Harbor River and Four Mile Branch, which together form the northeastern and eastern borders of the municipality. Major transportation routes include U.S. Highway Route 322 and State Highway Route 42. The land is gently rolling and mostly forested with a section of the municipality included in the Winslow Fish and Wildlife Management Area.

Figure GC.12-2: Monroe Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.12-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.12-3: Monroe Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Monroe Township	Gloucester County	Region	New Jersey
2000 Population	28,967	254,673	974,328	8,414,350
2010 Population	36,129	288,288	1,024,926	8,791,894
Percent Change	24.72%	13.20%	5.19%	4.49%
Population Density	778.8 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	46.39 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	25.7	24.4	24.1	23.5
% of Population 18 - 64	60.7	63.2	62.7	63
% of Population 65 and over	13.6	12.4	13.2	13.5

Table GC.12-4 illustrates how Monroe Township ranks in the county, the four county region, and New Jersey.

Table GC.12-4: Monroe Township Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	State (total of 565)
Population Rank	2	7	63
Land Area Rank	2	6	31
Population Density Rank	16	55	407
Population Change Rank	6	7	-

Table GC.12-5 includes information related to economic and housing statistics for Monroe Township, Gloucester County, the four county region, and New Jersey.

Table GC.12-5: Monroe Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Monroe Township	Gloucester County	Region	New Jersey
Date Incorporated	March 3, 1859	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$66,761	\$58,629	\$60,933	\$69,811
Total Number of Housing Units	13,387	109,796	397,990	3,529,033
Occupied Housing Units	12,815	104,271	372,472	3,176,069
Vacant Housing Units	572	5,525	25,518	352,964
Owner Occupied Housing Units	10,678	83,525	266,593	2,126,279
Renter Occupied Housing Units	2,137	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Monroe Township	Gloucester County	Region	New Jersey
Building Permits	208	716	1,554	13,535
Largest Industry	Educational services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

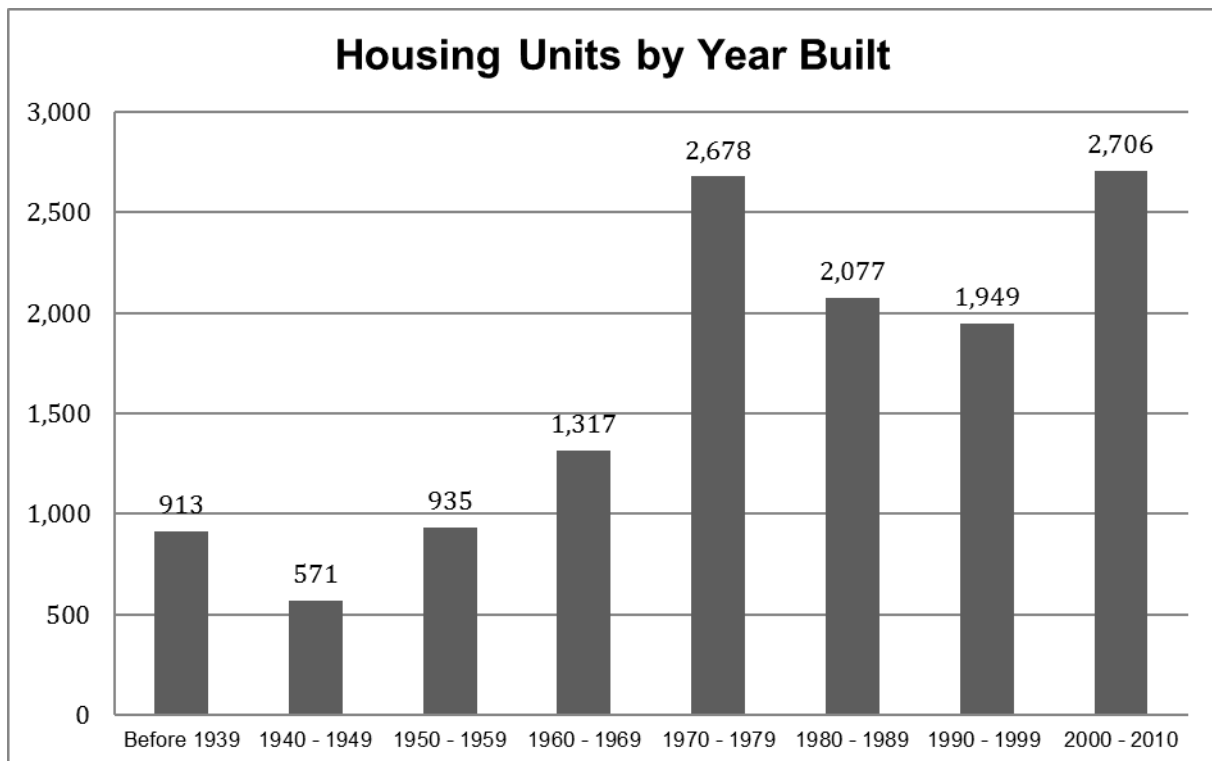
Table GC.12-6 illustrates how Monroe Township ranks in the county and the four county region.

Table GC.12-6: Monroe Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	15	35
Vacant Housing Rank	3	13
Renter Occupied Housing Rank	5	16
Building Permits Rank	1	1

Figure GC.12-3 illustrates development patterns in Monroe Township by examining housing units by year built. One in five homes in Monroe Township was built between 2000 and 2010.

Figure GC.12-3: Monroe Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Dam Failure
- Flood
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter Weather
- Wildfire

Moderate Priority

- Drought
- Extreme Temperature: Cold & Hot

Low Priority

- Earthquake

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Levee Failure

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3: Hazard Identification and Risk Assessment

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.12-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.12-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.12-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.12-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.12-8: Monroe Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Township Hall	Municipal	Administrative Offices	125 Virginia Avenue, Williamstown		N	Y		
CF-2	Emergency Operations Center	EOC	Co-located Facilities	125 Virginia Avenue, Williamstown	CF-1	N	Y		M-8
CF-3	Police Station	Law Enforcement Facilities	Stations	125 Virginia Avenue, Williamstown	CF-1	N	Y	Includes holding cell	
CF-4	Williamstown Fire Station #1	FireStation	Stations	555 South Main Street, Williamstown		N	Y		M-15
CF-5	Williamstown Fire Station #2	FireStation	Stations	1200 Glassboro Road, Williamstown		N	Y		M-15
CF-6	Cecil Fire Company	FireStation	Stations	295 Whitehall Road, Williamstown		N	Y		M-15
CF-7	EMS	EMS	Municipal Stations	700 Corkery Lane, Williamstown		N	Y		
CF-8	Public Works	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	1040 Glassboro Road, Williamstown		N	N		
CF-9	Buildings & Grounds	Public Works	Maintenance / Work Areas	305 Bluebell Road, Williamstown		N	N		
CF-10	Monroe Township Municipal Utilities Authority	Utilities – Water & Sewer	Administrative Offices	372 South Main Street, Williamstown					
CF-11	Whitehall Elementary School	Schools	Public Schools	161 Whitehall Road, Williamstown		Y ²	Y		

² Red Cross approved shelter.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-12	Oak Knoll Elementary School	Schools	Public Schools	23 Bodine Avenue, Williamstown		Y	Y		
CF-13	Radix Elementary School	Schools	Public Schools	363 Radix Road, Williamstown		Y	Y		
CF-14	Holly Glen Elementary School	Schools	Public Schools	900 North Main Street, Williamstown		Y	Y		M-12
CF-15	Williamstown Middle School	Schools	Public Schools	561 Clayton Road, Williamstown		Y ²	Y		M-13
CF-16	Williamstown High School	Schools	Public Schools	700 North Tuckahoe Road, Williamstown		Y ²	Y		M-14
CF-17	Y.A.L.E. School Inc.	Schools	Private Schools	300 North Black Horse Pike, Williamstown					
CF-18	St. Mary's School	Schools	Private Schools	32 Carrol Avenue, Williamstown		N	N		
CF-19	Concordia Commons at Williamstown Senior Living	Vulnerable Populations Facilities	Private Assisted Living	1640 South Black Horse Pike, Williamstown		N ³	Y		
CF-20	Juniper Village Assisted Living / Wellspring Memory Care	Vulnerable Populations Facilities	Private Assisted Living	1648 Black Horse Pike, Williamstown		N ³	Y		
CF-21	Meadow View Nursing & Respiratory Care Center	Health Care Facilities	Private Rehabilitation Centers	1420 South Black Horse Pike, Williamstown		N ³	Y		
CF-22	Cross Keys Airport	Other Municipal	Airport (Private)	1300 Tuckahoe Road, Williamstown					

³ Shelter in place.

Part 3: Hazard Identification and Risk Assessment

Table GC.12-9: Monroe Township (Gloucester County) Critical Facilities Hazard Exposure⁴

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Township Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-3	Police Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-4	Williamstown Fire Station #1	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-5	Williamstown Fire Station #2	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-6	Cecil Fire Company	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-7	EMS	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-8	Public Works	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-9	Buildings & Grounds	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-10	Monroe Township Municipal Utilities Authority	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-11	Whitehall Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-12	Oak Knoll Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-13	Radix Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-14	Holly Glen Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-15	Williamstown Middle School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-16	Williamstown High School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-17	Y.A.L.E. School Inc.	N/A	N/A	N/A		N/A			N/A	N/A	N/A				
CF-18	St. Mary's School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

⁴ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-19	Concordia Commons at Williamstown Senior Living	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-20	Juniper Village Assisted Living / Wellspring Memory Care	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-21	Meadow View Nursing & Respiratory Care Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-22	Cross Keys Airport	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Gloucester, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures, in particular repetitive flood loss properties
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.12-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.12-10.

Table GC.12-10: Status of Monroe Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Monroe 1: Engineering study to determine appropriate flood mitigation action in Main Street Area.	Not completed, not funded	Revised multi-jurisdictional mitigation measure included in updated Municipal Appendix.	MJ-1
Monroe 2: Building evaluation of EOC located in Municipal Building on 125 Virginia Avenue.	Completed	Issue was resolved through municipal capital improvement funds. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Monroe 3: Elevation and dry floodproofing of two homes located next to Victory Lake and Timber Lake.	Not completed, not funded	Municipality can support properties with flooding issues that are not designated repetitive flood loss properties through outreach and education. Revised mitigation measure included in updated NJ4 HMP and Municipal Appendix.	M-1
Monroe 4: Fixing one dam located by Victory Lake.	Completed	Issue was resolved through NJ DEP funding. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Monroe 5: Enhance floodplain management administration, staffing, and process.	Not completed, not funded	Revised mitigation measure included in updated NJ4 HMP and Municipal Appendix.	M-5
Monroe 6: Create safety zones around critical facilities in wildfire risk areas.	Not completed, not funded	Revised mitigation measure included in updated NJ4 HMP and Municipal Appendix.	M-15

Table GC.12-10 Notes:

- A. See Tables GC.12-11 and GC.12-12 for municipal (M-#) mitigation measures
- B. See Table GC.12-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.12-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Table GC.12-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.12-4.

Table GC.12-11: Monroe Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.²	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #2	Existing
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-5	Enhance floodplain management administration, staffing, and processes through staffing and monetary support.	All	Goal #4	Both
M-6	Engineering study to determine evacuation solutions for streets between Victory Lakes and Timber Lakes.	All	Goal #4	Both
M-7	Engineering risk study of Upper Victory Dam.	Dam Failure	Goal #4	Both
M-8	Construction of new Emergency Operations Center in a non-flood / low hazard area (CF-2).	Flood	Goal #4	Both
M-9	Engineering study of drainage and roadway including culvert reconstruction at North Shore Drive causeway. ³	Flood	Goal #4	Both
M-10	Engineering study of Diamond Lakes area to identify and determine solutions for flooding issues.	Flood	Goal #4	Both
M-11	Address identified Repetitive Flood Loss Properties. ⁴	Flood	Goal #4	Both
M-12	Harden Holly Glen Elementary School infrastructure to include a new roof to sustain high winds (CF-14).	High Wind	Goal #4	Both
M-13	Harden Williamstown Middle School infrastructure to include a new roof to sustain high winds (CF-15).	High Wind	Goal #4	Both
M-14	Harden Williamstown High School infrastructure to include new roof to sustain high winds (CF-16).	High Wind	Goal #4	Both
M-15	Create safety zones around critical facilities, including Monroe Township fire stations, located in wildfire risk areas (CF-4 / CF-5 / CF-6).	Wildfire	Goal #4	Both

³ Project included in Letter of Interest (LOI) for DR 4086 HMGP. LOI project #1239 budget = \$700,000.00.

⁴ Project included in Letter of Interest (LOI) for DR 4086) HMGP for one RL property. LOI project #1404 budget = \$218,000.00.

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.12-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria⁵
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁶
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.12-12: Monroe Township (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	High	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.

⁵ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁶ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Enhance floodplain management administration, staffing, and processes through staffing and monetary support.	Municipal OEM and Floodplain Administrator	Moderate	Capabilities and Coordination	< \$50K	Three to five years	Conduct project scoping.
M-7	Engineering study to determine evacuation solutions for streets between Victory Lakes and Timber Lakes.	Municipal OEM, Public Works Department, and Engineering	High	Private Property Flood Mitigation	< \$50K	One to three years	Conduct project scoping.
M-8	Engineering risk study of Upper Victory Dam.	Municipal OEM, Public Works Department, and Engineering	Moderate	Private Property Flood Mitigation	< \$50K	Three to five years	Conduct project scoping.
M-6	Construction of new Emergency Operations Center in a non-flood / low hazard area (CF-2).	Municipal OEM	Low	Public Property Flood Mitigation	\$1M - \$3M	Three to five years	Conduct project scoping.
M-9	Upgrade drainage and roadway including culvert reconstruction at North Shore Drive causeway.	Municipal OEM, Public Works Department, and Engineering	Moderate	Public Property Flood Mitigation	\$500K - \$1M	Three to five years	Develop scope of work for engineering study and procure professional consulting services.
M-10	Engineering study of Diamond Lakes area to identify and determine solutions for flooding issues.	Municipal OEM, Public Works Department, and Engineering	Moderate	Public Property Flood Mitigation	< \$50K	Three to five years	Develop scope of work for engineering study and procure professional consulting services.
M-11	Address identified Repetitive Flood Loss Properties.	Floodplain Administrator	High	Private Property Flood Mitigation	Staff time commitment	Six months	Prior to initiating landowner contacts, identify flood insurance implications and mitigation options including eligible activities per FEMA HMA programs.
M-12	Harden Holly Glen Elementary School infrastructure to include a new roof to sustain high winds (CF-14).	Municipal OEM and School Board	Moderate	Building Retrofit	\$100K – \$500K	Three to five years	Conduct project scoping.
M-13	Harden Williamstown Middle School infrastructure to include a new roof to sustain high winds (CF-15).	Municipal OEM and School Board	Moderate	Building Retrofit	\$100K – \$500K	Three to five years	Conduct project scoping.
M-14	Harden Williamstown High School infrastructure to include new roof to sustain high winds (CF-16).	Municipal OEM and School Board	Moderate	Building Retrofit	\$100K – \$500K	Three to five years	Conduct project scoping.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-15	Create safety zones around critical facilities, including Monroe Township fire stations, located in wildfire risk areas (CF-4 / CF-5 / CF-6).	Municipal OEM and Fire Departments	High	Public Property Flood Mitigation	< \$100K	One to three years	Conduct project scoping.

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.12-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.12-4.

Table GC.12-13: Monroe Township (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Alleviate flooding at New Jersey Route 322 (South Black Horse Pike) at Squankum Branch.	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW, NJDEP, NJDOT	High

Part 4: Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Responsible Party	Priority
MJ-2	Improve storm drainage at Monroe Village storm water management and overflowing retention basin on Prince Avenue located off of US Route 322 (Glassboro Road). ⁷	Flood	Goal #4	Existing	Municipal OEM, NJDOT	Low
MJ-3	County Route 658 (Pitman Downer Road) property storm water management. ⁸	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW	Low
MJ-4	Improve storm drainage at New Jersey Route 42 (North Blackhorse Pike) from Cross Keys Road to Laurel Avenue. ⁹	Flood	Goal #4	Existing	Municipal OEM, NJDOT	Moderate
MJ-5	Improve storm drainage at US Route 322 and Walnut Street.	Flood	Goal #4	Existing	Municipal OEM, NJDOT	Moderate

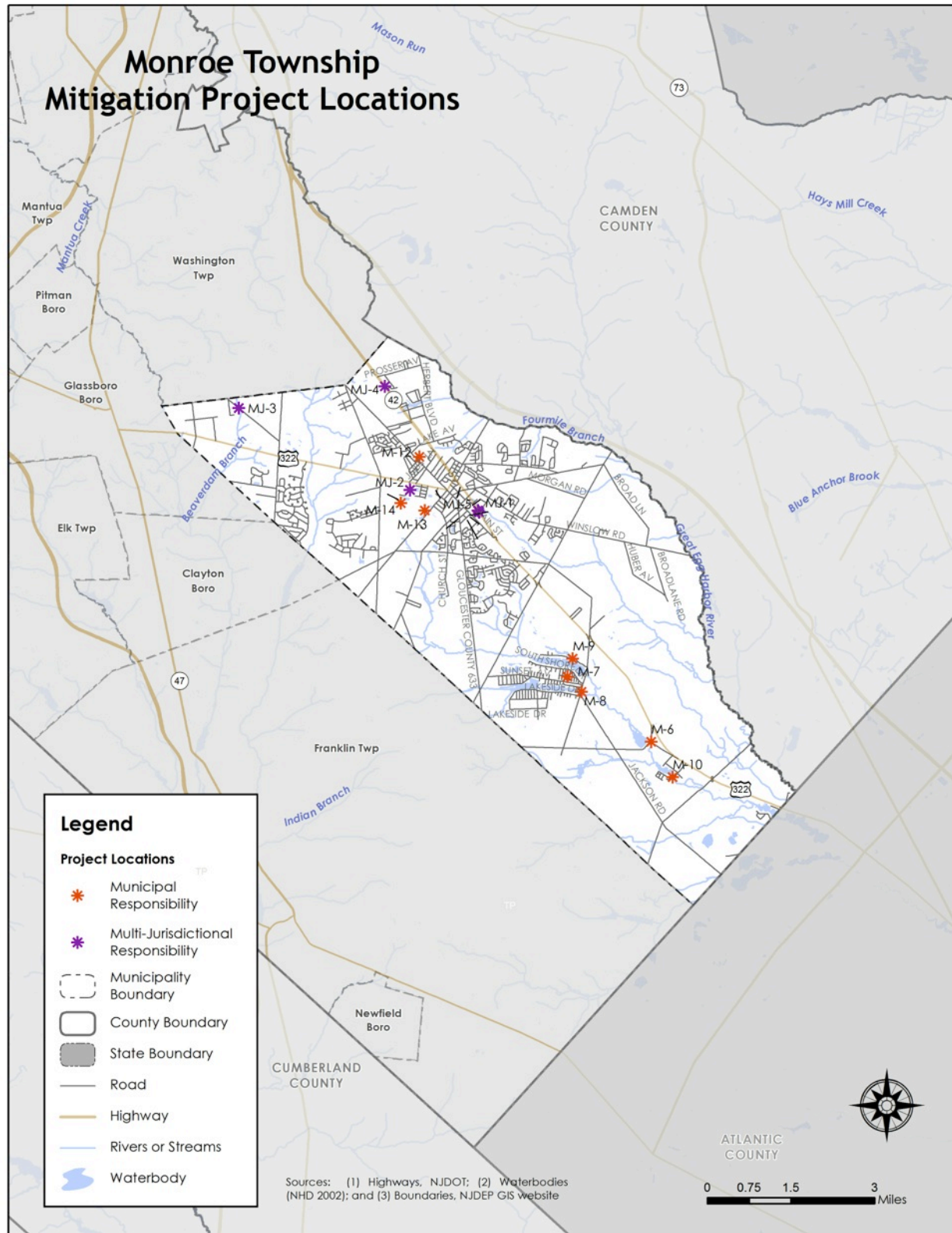
⁷ Project included in Letter of Interest (LOI) for DR 4086 HMGP. LOI project #1240 budget = \$970,000.00.

⁸ Project included in Letter of Interest (LOI) for DR 4086 HMGP. LOI project #1238 budget = \$500,000.00.

⁹ Project included in Letter of Interest (LOI) for DR 4086 HMGP. LOI project #1236 budget = \$490,000.00.

Part 4: Mitigation Measures

Figure GC.12-4: Monroe Township Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan – Base Plan (2014)
- Floodplain Ordinance¹⁰
- Master Plan (2004) and Re-examination Reports (2008 and 2010)
- Land Use and Development Ordinances¹¹
- Six Year Capital Summary (2014)¹²
- Stormwater Management Plan¹³

¹⁰ <http://www.ecode360.com/7177986#7177986>

¹¹ <http://www.ecode360.com/7179835#7179835>

¹² <http://monroetownshipnj.org/wp-content/uploads/2014/06/2014-Six-Year-Capital-Summary-Rev-2-25-14.pdf>

¹³ <http://www.ecode360.com/14720712?highlight=stormwater#14720712>

Attachment A: Public Review Comments

The following comments were received during the public review of the Monroe Township Municipal Appendix:

Table GC.12.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Monroe Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.14
Newfield Borough, New Jersey

May 29, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.14-i
Part 1 Overview	GC.14-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.14-1
1.2: Newfield Borough (Gloucester County) Municipal Appendix	GC.14-1
Part 2 Participation	GC.14-2
2.1: Municipal Working Group Participation	GC.14-2
2.2: Public Participation	GC.14-4
Part 3 Hazard Identification and Risk Assessment	GC.14-5
3.1: Municipal Profile	GC.14-5
3.2: Hazard Priorities	GC.14-9
3.3: Hazard Mapping	GC.14-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.14-11
Part 4 Mitigation Measures	GC.14-14
4.1: Mitigation Goals and Strategy	GC.14-14
4.2: SDVR HMP Mitigation Measures	GC.14-15
4.3: Municipal Mitigation Measures – Identification	GC.14-16
4.4: Municipal Mitigation Measures – Implementation	GC.14-17
4.5: Multi-Jurisdictional Mitigation Measures	GC.14-19
4.6: Plan Review and Integration	GC.14-21

Table of Contents

List of Figures

Figure GC.14-1: Newfield Borough (Gloucester County) Location Map	GC.14-5
Figure GC.14-2: Newfield Borough Base Map	GC.14-6
Figure GC.14-3: Newfield Borough Housing Units by Year Built	GC.14-8
Figure GC.14-4: Newfield Borough Mitigation Project Locations	GC.14-20

List of Tables

Table GC.14-1: Newfield Borough (Gloucester County) Working Group	GC.14-2
Table GC.14-2: Public Participation	GC.14-4
Table GC.14-3: Newfield Borough Demographics	GC.14-7
Table GC.14-4: Newfield Borough Demographic Rankings	GC.14-7
Table GC.14-5: Newfield Borough Economics and Housing	GC.14-7
Table GC.14-6: Newfield Borough Ranking (Economics and Housing)	GC.14-8
Table GC.14-7: Supporting Mapping and Exhibits	GC.14-10
Table GC.14-8: Newfield Borough Critical Facilities Inventory	GC.14-12
Table GC.14-9: Newfield Borough Critical Facilities Hazard Exposure	GC.14-13
Table GC.14-10: Status of Newfield Borough SDVR HMP Mitigation Measures	GC.14-15
Table GC.14-11: Newfield Borough Municipal Mitigation Measures Identification	GC.14-16
Table GC.14-12: Newfield Borough Municipal Mitigation Measures Implementation	GC.14-18
Table GC.14-13: Newfield Borough Multi-Jurisdictional Mitigation Measures	GC.14-19

Attachments

Attachment GC.14.A: Public Review Comments	GC.14.A-1
Attachment GC.14.B: Adoption Resolution	GC.14.B-1
Attachment GC.14.C: Approval Letter	GC.14.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Newfield Borough (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Newfield Borough in Gloucester County, New Jersey.

The Newfield Borough Municipal Working Group recommended the Newfield Borough (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Newfield Borough Council adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.14-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.14-1: Newfield Borough (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Christopher	Davis	Newfield Borough	OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Donald	Sullivan	Newfield Borough Council / Newfield Borough Public Safety	Council Member / Public Safety Chair Person		<input checked="" type="checkbox"/>	
Samuel E.	Barbagli	Newfield Borough Public Works Department	Public Works Supervisor		<input checked="" type="checkbox"/>	
David	Gallo	Newfield Borough Police Department	Patrolman	<input checked="" type="checkbox"/>		Provided municipal documents for review.
Jeffrey	Schaw	Newfield Borough Police Department	Patrolman		<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on July 30, 2014.

² Round 2 Work Session was held on October 29, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.14-1.

Part 2: Participation

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Building Code Official
- Engineering
- Fire
- Emergency Medical Services
- Community / Faith-Based Organizations
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- Floodplain Administrator (Newfield Borough is not a participating community under the National Flood Insurance Program)
- Land Use / Economic Development Planner
- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Business Associations
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Major Employers and Businesses
- Healthcare Institutions

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.14-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.14-2: Public Participation

Date	Type of Involvement	Location
October 25, 2014	Link to Project Website (http://nj4hmp.com) established	Borough of Newfield ⁵
October 27, 2014	Flyers posted	Newfield Borough Police Department
December 3, 2014	Preliminary Municipal Appendix posted to website for public comment	Borough of Newfield ⁵
May 7, 2015	Draft Municipal Appendix posted to website for public comment	Borough of Newfield ⁶
May 12, 2015	Public hearing included on Newfield Borough Council agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Newfield Borough Municipal Building
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁷ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁸

⁵ <http://www.newfieldboro.net/>

⁶ <http://www.newfieldboro.net/2015/05/577/>

⁷ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁸ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

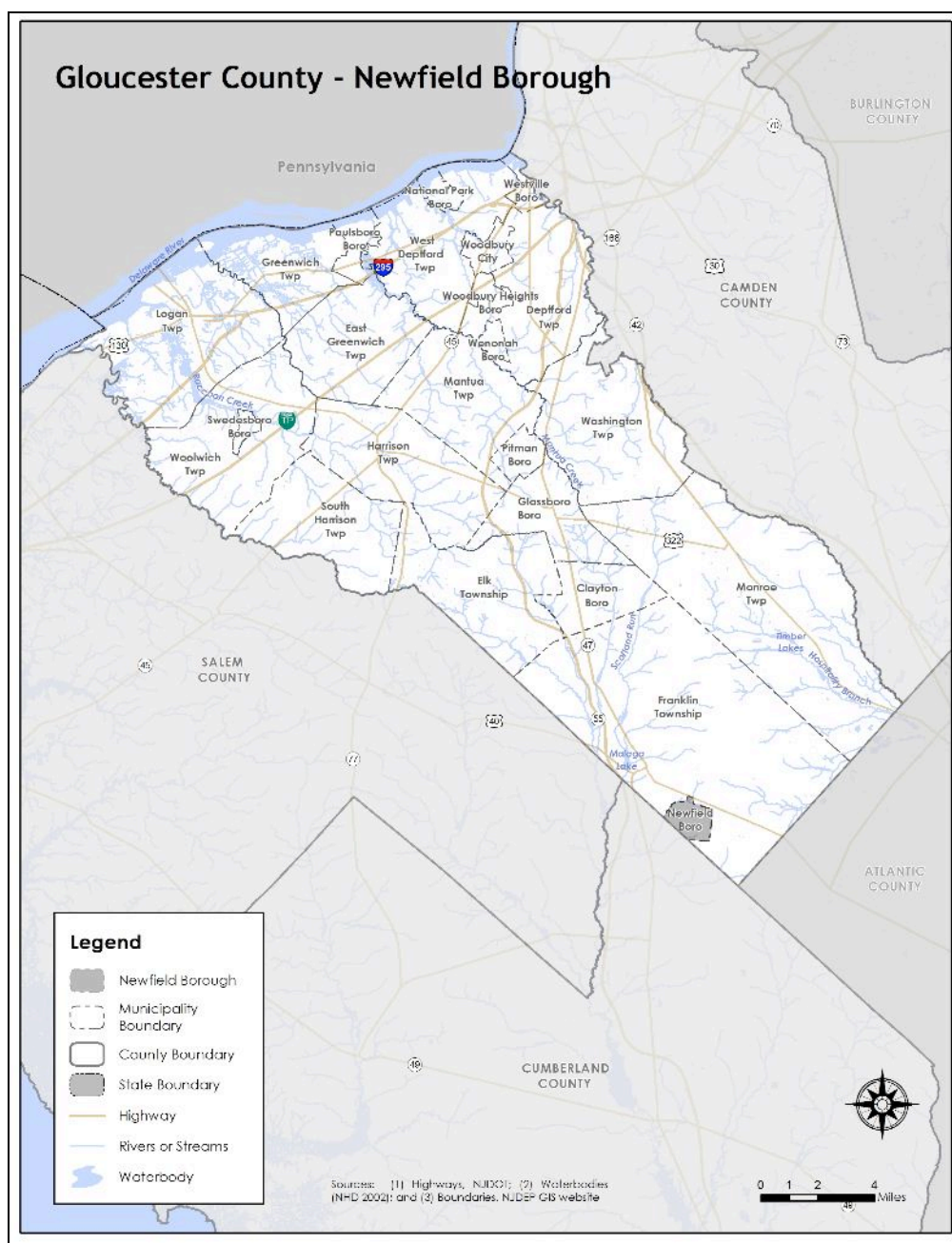
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Newfield Borough is located in the southwestern part of Gloucester County (See Figure GC.14-1).

Figure GC.14-1: Newfield Borough (Gloucester County) Location Map

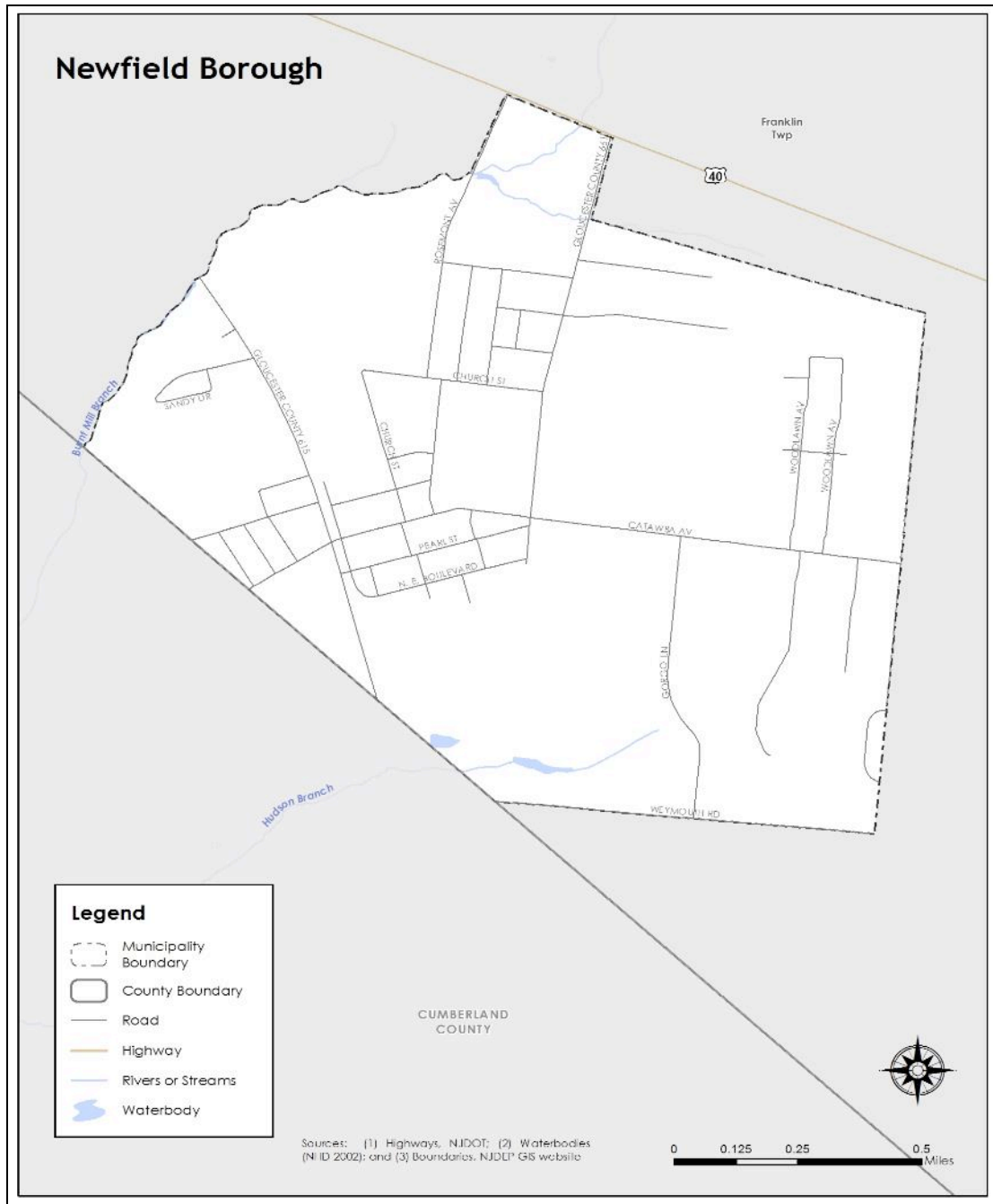


Part 3: Hazard Identification and Risk Assessment

Newfield Borough is a rural residential community with minimal commercial areas.

Per Figure GC.14-2, the major water courses include Burnt Mill Branch and Hudson Branch. A major transportation route includes Gloucester County Highway 615. The land is gently rolling.

Figure GC.14-2: Newfield Borough Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.14-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.14-3: Newfield Borough Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Newfield Borough	Gloucester County	Region	New Jersey
2000 Population	1,616	254,673	974,328	8,414,350
2010 Population	1,553	288,288	1,024,926	8,791,894
Percent Change	-3.90%	13.2%	5.19%	4.49%
Population Density	912.0 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	1.70 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	23.4	24.4	24.1	23.5
% of Population 18 - 64	62.5	63.2	62.7	63
% of Population 65 and over	14.1	12.4	13.2	13.5

Table GC.14-4 illustrates how Newfield Borough ranks in the county, the four county region, and New Jersey.

Table GC.14-4: Newfield Borough Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	24	81	511
Land Area Rank	20	64	417
Population Density Rank	15	53	396
Population Change Rank	22	76	-

Table GC.14-5 includes information related to economic and housing statistics for Newfield Borough, Gloucester County, the four county region, and New Jersey.

Table GC.14-5: Newfield Borough Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Newfield Borough	Gloucester County	Region	New Jersey
Date Incorporated	March 8, 1924	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$60,350	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	626	109,796	397,990	3,529,033
Occupied Housing Units	579	104,271	372,472	3,176,069
Vacant Housing Units	47	5,525	25,518	352,964
Owner Occupied Housing Units	475	83,525	266,593	2,126,279
Renter occupied Housing Units	104	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Newfield Borough	Gloucester County	Region	New Jersey
Building Permits	0	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

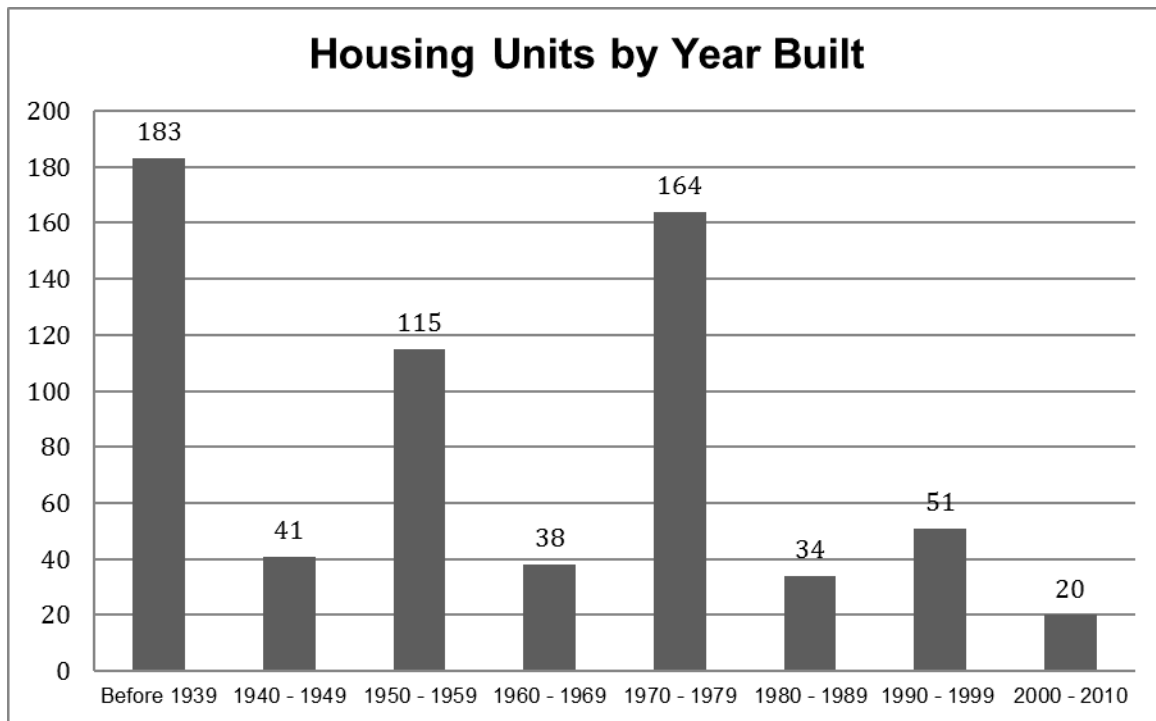
Table GC.14-6 illustrates how Newfield Borough ranks in the county and the four county region.

Table GC.14-6: Newfield Borough Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	20	55
Vacant Housing Rank	21	75
Renter Occupied Housing Rank	21	77
Building Permits Rank	22	85

Figure GC.14-3 illustrates development patterns in Newfield Borough by examining housing units by year built. About 29% of homes in Newfield Borough were built prior to 1939.

Figure GC.14-3: Newfield Borough Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- None

Moderate Priority

- Flood
- High Wind
- Severe Weather – Winter

Low Priority

- Drought
- Earthquake
- Extreme Temperature: Hot & Cold
- Severe Weather – Summer
- Wildfire

Four additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Dam Failure
- Geologic Hazards
- Levee Failure

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.14-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.14-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.14-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.14-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.14-8: Newfield Borough (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Borough Hall	Municipal	Administrative Offices	18 Catawba Avenue, Newfield	CF-2, CF-3, CF-4, CF-11	Y ²	Y		
CF-2	Emergency Operations Center	EOC	Co-located Facilities	18 Catawba Avenue, Newfield	CF-1	N	Y		
CF-3	Police Station	Law Enforcement Facilities	Stations	18 Catawba Avenue, Newfield	CF-1	N	Y		
CF-4	Newfield Borough Fire Department	Fire Station	Stations	18 Catawba Avenue, Newfield	CF-1	N	Y		
CF-5	EMS	EMS	Municipal Stations	113 Catawba Avenue, Newfield		N	Y		
CF-6	Public Works	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	15 Gorgo Lane, Newfield	CF-9	N	N		M-5 / M-10
CF-7	Well #3	Utilities – Water	Wellhead	Catawba Avenue, Newfield		N/A	Y		
CF-8	Well #5	Utilities – Water	Wellhead	Catawba Avenue & Woodlawn Avenue, Newfield		N/A	Y		
CF-9	Water Tower	Utilities – Water	Water Towers	15 Gorgo Lane, Newfield	CF-6	N/A	N		M-6
CF-10	Edgerton Christian Academy	Schools	Charter Schools	212 Catawba Avenue, Newfield		Y ²	N		M-7
CF-11	Community Center / Senior Center	Other Municipal	Community Center	18 Catawba Avenue, Newfield	CF-1	N	Y		

² Shelter of last resort.

Part 3: Hazard Identification and Risk Assessment

Table GC.14-9: Newfield Borough (Gloucester County) Critical Facilities Hazard Exposure³

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Borough Hall	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A		
CF-2	Emergency Operations Center	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A		
CF-3	Police Station	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A		
CF-4	Fire Company	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A		
CF-5	EMS	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A		
CF-6	Public Works	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A		
CF-7	Well #3	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A		
CF-8	Well #5	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A		
CF-9	Water Tower	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A		
CF-10	Edgerton Christian Academy	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A		
CF-11	Community Center / Senior Center	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A		

³ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.14-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.14-10.

Table GC.14-10: Status of Newfield Borough (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
N/A	N/A	Newfield Borough did not participate in the SDVR Hazard Mitigation Plan. Therefore there are no mitigations measures that were previously identified for the municipality.	N/A

Table GC.14-10 Notes:

- A. See Tables GC.14-11 and GC.14-12 for municipal (M-#) mitigation measures
- B. See Table GC.14-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.14-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Note: Newfield Borough does not currently have RL or SRL properties per information provided by the New Jersey Department of Environmental Protection.

Table GC.14-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.14-4.

Table GC.14-11: Newfield Borough (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.²	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #2	Existing

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-5	Install permanent back-up emergency power generator at Public Works building (CF-6).	All	Goal #4	Both
M-6	Install permanent back-up emergency power generator at Water Tower (CF-9).	All	Goal #4	Both
M-7	Install permanent back-up emergency power generator Edgerton Christian Academy (CF-10).	All	Goal #4	Both
M-8	Engineering study to determine benefit of solar panel usage throughout Newfield Borough.	All	Goal #4	Existing
M-9	Develop tree removal / maintenance plan to reduce risk of power disruption and damage to critical facilities.	All	Goal #4	Both
M-10	Harden / construct protective infrastructure for outdoor garage at Public Works facility to protect municipal equipment (CF-6).	High Wind	Goal #4	Both

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.14-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria³
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁴
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

³ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

Table GC.14-12: Newfield Borough (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Moderate	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> Work with County Working Group to identify resource needs and availability. Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.
M-5	Install permanent back-up emergency power generator at Public Works building (CF-6).	Municipal OEM and Public Works Department	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Install permanent back-up emergency power generator at Water Tower (CF-9).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-7	Install permanent back-up emergency power generator Edgerton Christian Academy (CF-10).	Municipal OEM and Public Works Department	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-8	Engineering study to determine benefit of solar panel usage throughout Newfield Borough.	Municipal OEM and Public Works Department	Moderate	Public Property Mitigation	< \$50K	One to three years	Develop scope of work for engineering study and procure professional consulting services.
M-9	Develop tree removal / maintenance plan to reduce risk of power disruption and damage to critical facilities.	Municipal OEM and Public Works Department	High	Private Property Mitigation	< \$50K	One to three years	Conduct project scoping.
M-10	Harden / construct protective infrastructure for outdoor garage at Public Works facility to protect municipal equipment (CF-6).	Municipal OEM and Public Works Department	Moderate	Building Retrofit	< \$100K	One to three years	Conduct project scoping.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.14-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

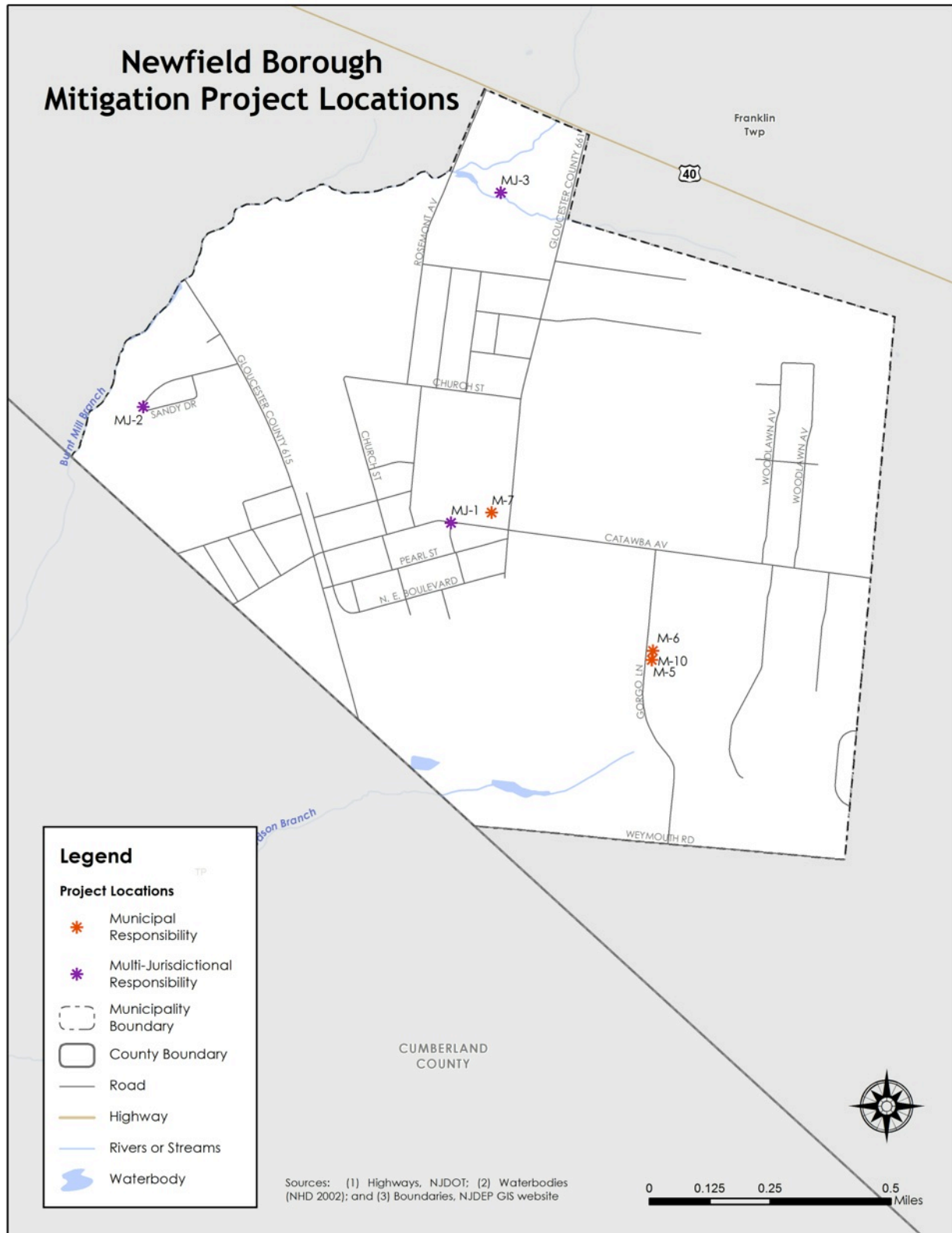
Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.14-4.

Table GC.14-13: Newfield Borough (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Alleviate flooding at Catawba Avenue and Hazel Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-2	Alleviate flooding at Sandy Drive to address drainage issues between New Jersey Route 42 and Fawn Drive.	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW	Moderate
MJ-3	Alleviate flooding at Rosemont Avenue and West Boulevard.	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW, NJDOT	Moderate

Part 4: Mitigation Measures

Figure GC.14-4: Newfield Borough Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan – Base Plan (2014)
- Master Plan (1978), Amendments (2006 et al), and Reexamination Report (2004)
- Stormwater Management Plan (2004)
- Zoning Ordinance ⁵

⁵ <http://ecode360.com/13251335#13251335>

Attachment A: Public Review Comments

The following comments were received during the public review of the Newfield Borough Municipal Appendix:

Table GC.14.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of May 29, 2015, no public review comments were received for the Newfield Borough Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.15
Paulsboro Borough, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.15-i
Part 1 Overview	GC.15-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.15-1
1.2: Paulsboro Borough (Gloucester County) Municipal Appendix	GC.15-1
Part 2 Participation	GC.15-2
2.1: Municipal Working Group Participation	GC.15-2
2.2: Public Participation	GC.15-4
Part 3 Hazard Identification and Risk Assessment	GC.15-5
3.1: Municipal Profile	GC.15-5
3.2: Hazard Priorities	GC.15-9
3.3: Hazard Mapping	GC.15-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.15-11
Part 4 Mitigation Measures	GC.15-15
4.1: Mitigation Goals and Strategy	GC.15-15
4.2: SDVR HMP Mitigation Measures	GC.15-16
4.3: Municipal Mitigation Measures – Identification	GC.15-17
4.4: Municipal Mitigation Measures – Implementation	GC.15-19
4.5: Multi-Jurisdictional Mitigation Measures	GC.15-21
4.6: Plan Review and Integration	GC.15-23

Table of Contents

List of Figures

Figure GC.15-1: Paulsboro Borough (Gloucester County) Location Map	GC.15-5
Figure GC.15-2: Paulsboro Borough Base Map	GC.15-6
Figure GC.15-3: Paulsboro Borough Housing Units by Year Built	GC.15-8
Figure GC.15-4: Paulsboro Borough Mitigation Project Locations	GC.15-22

List of Tables

Table GC.15-1: Paulsboro Borough (Gloucester County) Working Group	GC.15-2
Table GC.15-2: Public Participation	GC.15-4
Table GC.15-3: Paulsboro Borough Demographics	GC.15-7
Table GC.15-4: Paulsboro Borough Demographic Rankings	GC.15-7
Table GC.15-5: Paulsboro Borough Economics and Housing	GC.15-7
Table GC.15-6: Paulsboro Borough Ranking (Economics and Housing)	GC.15-8
Table GC.15-7: Supporting Mapping and Exhibits	GC.15-10
Table GC.15-8: Paulsboro Borough Critical Facilities Inventory	GC.15-12
Table GC.15-9: Paulsboro Borough Critical Facilities Hazard Exposure	GC.15-14
Table GC.15-10: Status of Paulsboro Borough SDVR HMP Mitigation Measures	GC.15-16
Table GC.15-11: Paulsboro Borough Municipal Mitigation Measures Identification	GC.15-17
Table GC.15-12: Paulsboro Borough Municipal Mitigation Measures Implementation	GC.15-19
Table GC.15-13: Paulsboro Borough Multi-Jurisdictional Mitigation Measures	GC.15-21

Attachments

Attachment GC.15.A: Public Review Comments	GC.15.A-1
Attachment GC.15.B: Adoption Resolution	GC.15.B-1
Attachment GC.15.C: Approval Letter	GC.15.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Paulsboro Borough (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Paulsboro Borough in Gloucester County, New Jersey.

The Paulsboro Borough Municipal Working Group recommended the Paulsboro Borough (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Paulsboro Borough Council adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.15-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.15-1: Paulsboro Borough (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Alfonso	Giampola	Paulsboro Borough OEM	Emergency Management Coordinator / Councilman	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
LeeAnn	Ruggeri	Paulsboro Administration	Borough Administrator / CFO		<input checked="" type="checkbox"/>	
Chris	Wachter	Paulsboro Police Department	Chief of Police	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Vernon	Marino	Paulsboro Police Department	Captain	<input checked="" type="checkbox"/>		
John	Daly	Paulsboro Water / Sewer Department	Water / Sewer Superintendent	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Michael	Ruffalo	Code Enforcement/Housing Inspections	Code Enforcement Officer/Housing Inspector ⁴	<input checked="" type="checkbox"/>		
Wayne	Bender	Code Enforcement/Housing Inspections	Code Enforcement Officer/Housing Inspector		<input checked="" type="checkbox"/>	
Walter	Quint	Paulsboro Public Schools	Superintendent of Schools		<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on July 24, 2014.

² Round 2 Work Session was held on October 15, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.15-1.

⁴ Replaced by Wayne Bender as of October 15, 2014.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Judy	MacKenzie	Paulsboro Chamber of Commerce	President		<input checked="" type="checkbox"/>	
Raymond	Jordan	Engineering Consultant to Borough	Principal, T & M Associates	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Eric	Biermann	Engineering Consultant to Borough	Consulting Engineer, Sickels and Associates, Inc. / Floodplain Administrator		<input checked="" type="checkbox"/>	
Bonnie	Rick	Risk Management Consultant to Borough	Public Entity Director, Hardenbergh Insurance Group	<input checked="" type="checkbox"/>		
Darryl	Eng	Construction Management Consultant to Paulsboro Marine Terminal	Construction Manager, AECOM		<input checked="" type="checkbox"/>	
Michael	Zumpino	Grants Consultant to Borough	Chairman, Triad Associates	<input checked="" type="checkbox"/>		

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁵

- Land Use Planner
- Public Works Department
- Community / Faith-Based Organizations
- Environmental Organizations
- Major Employers and Businesses
- Healthcare Institutions
- Private schools

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS/IT Specialist (Services provided by Gloucester County)
- Building Code Official (Services provided by East Greenwich Township)
- Emergency Medical Services (Services provided by Gloucester County)

⁵ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.15-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.15-2: Public Participation

Date	Type of Involvement	Location
October 16, 2014	Link to Project Website (http://nj4hmp.com) established	Borough of Paulsboro website "News Item" ⁶
November 9, 2014	Citizen Survey posted	Borough of Paulsboro website "News Item" ⁷
November 18, 2014	Public outreach	Paulsboro Fire Department general meeting
November 18, 2014	Preliminary Municipal Appendix posted to website for public comment	Borough of Paulsboro website "News Item" ⁶
December 2, 2014	Flyers posted	Paulsboro Municipal Building
December 2, 2014	Public hearing included on Paulsboro Borough Council agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Paulsboro Municipal Council Meeting
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix are included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁸ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁹

⁶ <http://www.paulsboronj.org/news-feed/2014/subject-hazard-mitigation-plan.aspx>

⁷ <http://www.paulsboronj.org/news-feed/2014/citizen-survey.aspx>

⁸ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁹ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

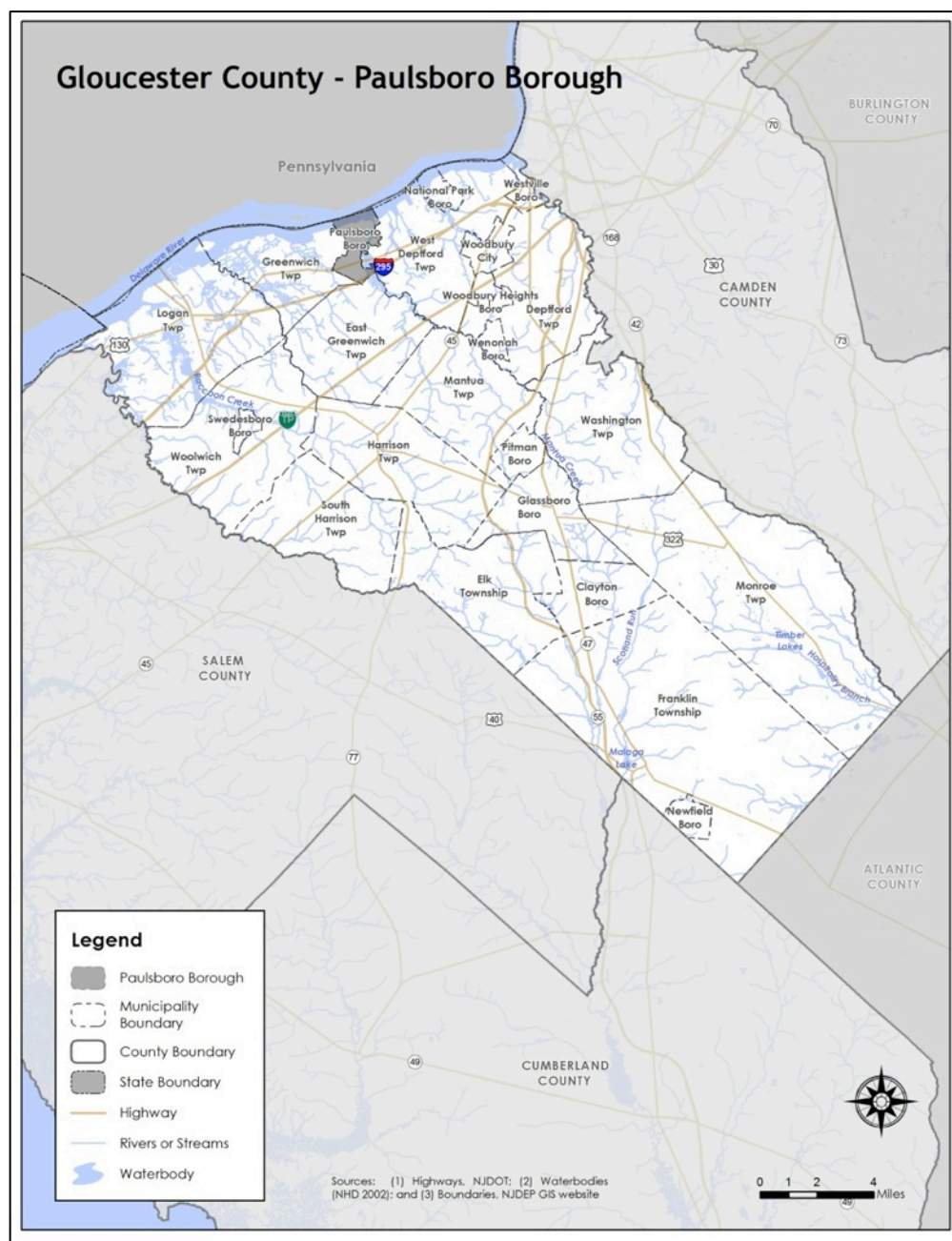
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Paulsboro Borough is located on the northern edge of Gloucester County (See Figure GC.15-1).

Figure GC.15-1: Paulsboro Borough (Gloucester County) Location Map

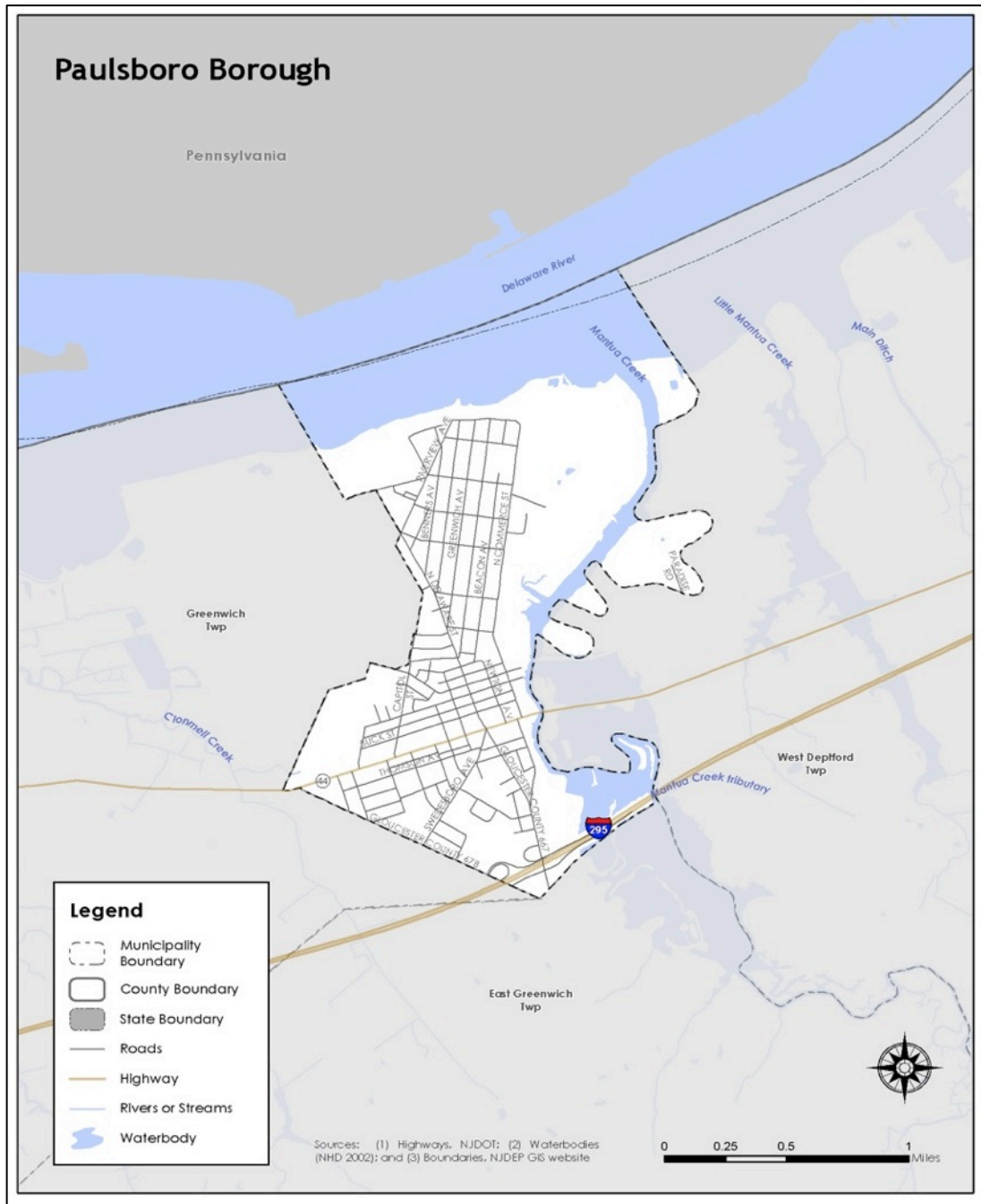


Part 3: Hazard Identification and Risk Assessment

Paulsboro Borough is a riverfront municipality with a stable population per recent census data. The Borough includes areas of lowlands but has a relatively high population density. About 35% of the housing stock was built before 1940 and 95% were built prior to 1980.

Per Figure GC.15-2, the major water courses include the Delaware River and Mantua Creek, which together form parts of the northern and eastern borders of the municipality respectively. Major transportation routes include Interstate 295 and State Highway 44. The land is predominantly flat.

Figure GC.15-2: Paulsboro Borough Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.15-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.15-3: Paulsboro Borough Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Paulsboro Borough	Gloucester County	Region	New Jersey
2000 Population	6,160	254,673	974,328	8,414,350
2010 Population	6,097	288,288	1,024,926	8,791,894
Percent Change	-1.02%	13.2%	5.19%	4.49%
Population Density	3,216.4 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	1.90 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	28.3	24.4	24.1	23.5
% of Population 18 - 64	60.3	63.2	62.7	63
% of Population 65 and over	11.4	12.4	13.2	13.5

Table GC.15-4 illustrates how Paulsboro Borough ranks in the county, the four county region, and New Jersey.

Table GC.15-4: Paulsboro Borough Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	14	43	341
Land Area Rank	19	61	401
Population Density Rank	5	30	205
Population Change Rank	17	60	-

Table GC.15-5 includes information related to economic and housing statistics for Paulsboro Borough, Gloucester County, the four county region, and New Jersey.

Table GC.15-5: Paulsboro Borough Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Paulsboro Borough	Gloucester County	Region	New Jersey
Date Incorporated	March 2, 1904	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$43,846	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	2,533	109,796	397,990	3,529,033
Occupied Housing Units	2,286	104,271	372,472	3,176,069
Vacant Housing Units	247	5,525	25,518	352,964
Owner Occupied Housing Units	1,347	83,525	266,593	2,126,279
Renter occupied Housing Units	939	20,746	105,879	1,049,790
Building Permits	3	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

Part 3: Hazard Identification and Risk Assessment

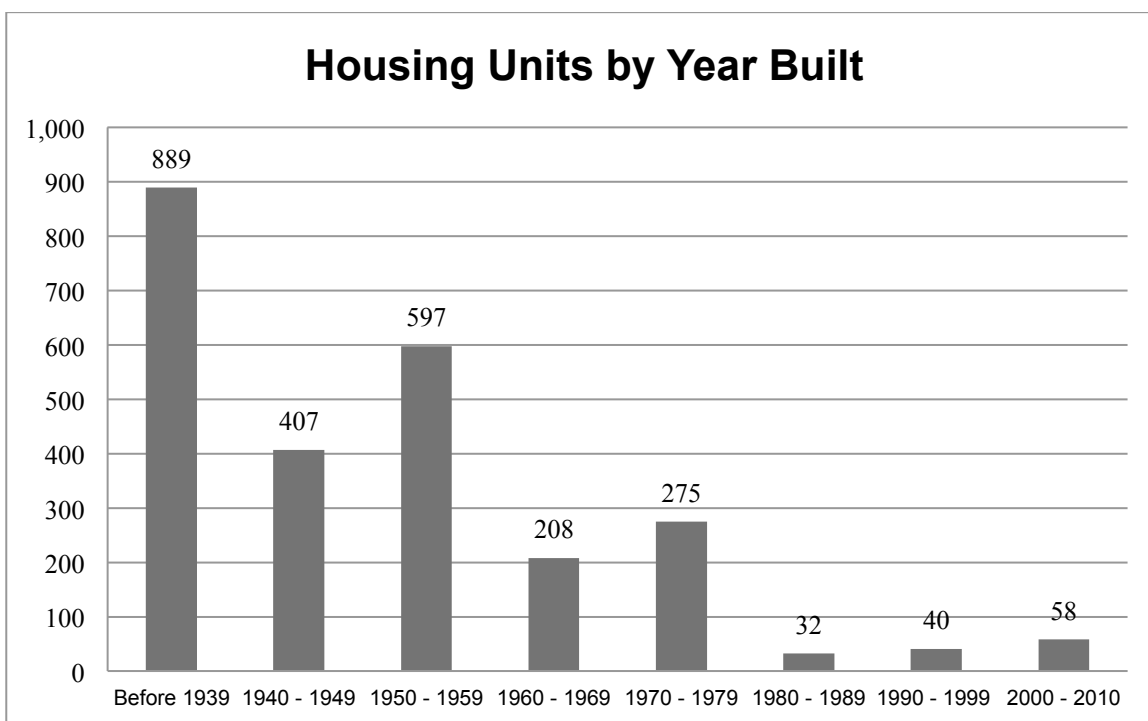
Table GC.15-6 illustrates how Paulsboro Borough ranks in the county and the four county region.

Table GC.15-6: Paulsboro Borough Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	24	82
Vacant Housing Rank	9	27
Renter Occupied Housing Rank	7	29
Building Permits	15	55

Figure GC.15-3 illustrates development patterns in Paulsboro Borough by examining housing units by year built.

Figure GC.15-3: Paulsboro Borough Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Flood
- High Wind
- Levee Failure

Moderate Priority

- Earthquake
- Extreme Temperature: Hot & Cold
- Severe Weather – Winter

Low Priority

- Coastal Erosion & Sea Level Rise
- Severe Weather – Summer
- Wildfire

Three additional hazards were considered but were not considered applicable to the municipality:

- Dam Failure
- Drought
- Geologic Hazards

¹ See *Section 3: Hazard Identification and Risk Assessment*.

Part 3: Hazard Identification and Risk Assessment

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.15-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.15-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge)	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where inundation due to storm surge may occur
Table RP.D-81	Levee Failure	Levee Inventory	Provide information about levee configuration
Figure RP.D-85	Levee Failure	Levee Locations	Identify locations of levees in and around the municipality

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.15-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.15-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.15-8: Paulsboro Borough (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Borough Hall	Municipal	Administrative Offices	1211 North Delaware Street, Paulsboro	CF-2, CF-3	N	N ²		M-5
CF-2	Emergency Operations Center	EOC	Co-located Facilities	1211 North Delaware Street, Paulsboro	CF-1	N	N		M-5
CF-3	Police Station	Law Enforcement	Stations	1211 North Delaware Street, Paulsboro	CF-1	N	N		M-5
CF-4	Fire Station	FireStations	Stations	1502 Swedesboro Avenue, Paulsboro		Y ³	N		M-6
CF-5	Fire Department Storage	FireStations	Equipment Storage	32 East Broad Street, Paulsboro		N/A	N	Former EMS Station	
CF-6	Borough Garage	Public Works	Combined Administrative Office / Work Area, Equipment / Material Storage, and Fueling Station	300 Baird Avenue, Paulsboro		N/A	N		M-7
CF-7	Municipal Water Plant	Utilities – Water	Treatment Plants	400 Summit Avenue, Paulsboro		N/A	Y		
CF-8	Municipal Water Tower	Utilities - Water	Water Towers	555 Lincoln Avenue, Paulsboro		N/A	N		
CF-9	Water Well and Pump Station #7	Utilities - Water	Combined Pump Station / Wellhead	Lodge and I-295, Paulsboro		N/A	Y		
CF-10	Wastewater Pump Station	Utilities – Wastewater	Pump Stations	Broad and Billingsport Road, Paulsboro		N/A	N		M-8
CF-11	Paulsboro High School	Schools	Public Schools	670 North Delaware Street, Paulsboro		Y ³	N		M-9

² Existing generator is inadequate to provide complete back-up power for Borough Hall and other functions housed at 1211 North Delaware Street.

³ American Red Cross has inspected the indicated shelters but certification by ARC is pending adequate back-up power generators.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-12	Billingsport Elementary School	Schools	Public Schools	441 Nassau Avenue, Paulsboro		N	N		
CF-13	Loudenslager Elementary School	Schools	Public Schools	100 Baird Avenue, Paulsboro		N	N		
CF-14	Guardian Angels Regional School	Schools	Private Schools	717 Beacon Avenue, Paulsboro		Y ³	N	4 th through 8 th Grade	M-10
CF-15	Paulsboro Senior Center	Vulnerable Populations Facilities	Senior Centers	30 East Broad Street, Paulsboro		Y ³	N		M-11
CF-16	Tra-Cee Day Care	Vulnerable Populations Facilities	Private Child Day Care	337 Mantua Avenue, Paulsboro		N	N		
CF-17	Headstart Day Care	Vulnerable Populations Facilities	Private Child Day Care	901 North Delaware, Paulsboro		N	N		
CF-18	Paulsboro Boys & Girls Club	Vulnerable Populations Facilities	Youth Centers	916 Pennline Road, Paulsboro		N	N		

Part 3: Hazard Identification and Risk Assessment

Table GC.15-9: Paulsboro Borough (Gloucester County) Critical Facilities Hazard Exposure⁴

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Borough Hall				N/A										
CF-2	Emergency Operations Center				N/A										
CF-3	Police Station				N/A										
CF-4	Fire Station				N/A										
CF-5	Fire Department Storage				N/A										
CF-6	Borough Garage				N/A										
CF-7	Municipal Water Plant				N/A										
CF-8	Municipal Water Tower				N/A										
CF-9	Water Well and Pump Station #7				N/A										
CF-10	Wastewater Pump Station				N/A										
CF-11	Paulsboro High School				N/A										
CF-12	Billingsport Elementary School				N/A										
CF-13	Loudenslager Elementary School				N/A										
CF-14	Guardian Angels Regional School				N/A										
CF-15	Paulsboro Senior Center				N/A										
CF-16	Tra-Cee Day Care				N/A										
CF-17	Headstart Day Care				N/A										
CF-18	Paulsboro Boys & Girls Club				N/A										

⁴ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations and identified storm drainage problem areas as initial risk reduction efforts
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.15-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.15-10.

Table GC.15-10: Status of Paulsboro Borough (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Paulsboro 1: Engineering study to determine appropriate flood mitigation action for Huff Avenue, Thompson Avenue and the 500 Block of Delaware Street.	Completed.	Engineering report completed in March 2014 for indicated areas and an additional area located at the intersection of 7 th Street and Beacon Avenue. Recommendations from report incorporated in mitigation measures included in updated hazard mitigation plan and the borough, with consultant support, is actively seeking funding.	M-12, M-13, and M-14.

Table GC.15-10 Notes:

- A. See Tables GC.15-11 and GC.15-12 for municipal (M-#) mitigation measures
- B. See Table GC.15-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.15-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Table GC.15-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.15-4.

Table GC.15-11: Paulsboro Borough (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Flood	Goal #2	Existing
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both

¹ See Section 3: Hazard Identification and Risk Assessment and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-5	Upgrade backup emergency power generator at Borough Hall to service Borough administrative, EOC, and police functions located at 1211 North Delaware Road (CF-1, CF-2, and CF-3).	All	Goal #4	Both
M-6	Install backup emergency power generator at Fire Station facilities located at 1502 Swedesboro Avenue (CF-4).	All	Goal #4	Both
M-7	Install backup emergency power generator at Borough Garage located at 300 Baird Avenue (CF-6P).	All	Goal #4	Existing
M-8	Install backup emergency power generator at wastewater pump station located at Broad and Billingsport Road (CF-10).	All	Goal #4	Both
M-9	Install backup emergency power generator at Paulsboro Senior High (shelter) (CF-11).	All	Goal #4	Existing
M-10	Support installation of backup emergency power generator at Guardian Angels Regional School (shelter) (CF-14).	All	Goal #4	Existing
M-11	Install backup emergency power generator at Paulsboro Senior Center (shelter) (CF-15).	All	Goal #4	Existing
M-12	Resolve storm drainage problems per engineering report recommendation regarding Huff, Thompson, and Paul Avenues to increase storm drain line diameters and manholes.	Flood	Goal #4	Existing
M-13	Resolve storm drainage problems per engineering report regarding 7 th Street and Beacon Avenue.	Flood	Goal #4	Existing
M-14	Resolve storm drainage problems per engineering report regarding 500 Block of Delaware Street.	Flood	Goal #4	Existing
M-15	Address identified Repetitive Flood Loss Properties.	Flood	Goal #4	Existing

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.15-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria²
- Project Type to help determine funding options and implementation mechanisms at the municipal level³
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.15-12: Paulsboro Borough (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	High ⁴	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Low	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	Low	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.

² See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

³ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

⁴ High priority assigned to public outreach and education due to high percentage of population that is considered transient.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Upgrade backup emergency power generator at Borough Hall to service Borough administrative, EOC, and police functions located at 1211 North Delaware Road (CF-1, CF-2, and CF-3).	Municipal OEM	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Install backup emergency power generator at Fire Station facilities located at 1502 Swedesboro Avenue (CF-4).	Paulsboro Fire Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-7	Install backup emergency power generator at Borough Garage located at 300 Baird Avenue (CF-6P).	Paulsboro Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-8	Install backup emergency power generator at wastewater pump station located at Broad and Billingsport Road (CF-10).	Paulsboro Water / Sewer Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-9	Install backup emergency power generator at Paulsboro Senior High (shelter) (CF-11).	Paulsboro School Board	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-10	Support installation of backup emergency power generator at Guardian Angels Regional School (shelter) (CF-14).	Municipal OEM	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-11	Install backup emergency power generator at Paulsboro Senior Center (shelter) (CF-15).	Paulsboro School Board	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-12	Resolve storm drainage problems per engineering report recommendation regarding Huff, Thompson, and Paul Avenues to increase storm drain line diameters and manholes.	Paulsboro Public Works Department	High	Private Property Flood Mitigation	\$2.3M ⁶	One to three years	Secure funding per on-going effort with Borough consultant.
M-13	Resolve storm drainage problems per engineering report regarding 7 th Street and Beacon Avenue.	Paulsboro Public Works Department	Moderate	Private Property Flood Mitigation	>\$1M	Three to five years	Develop as-built information for existing storm drainage system to determine options for mitigation .

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-14	Resolve storm drainage problems per engineering report regarding 500 Block of Delaware Street.	Paulsboro Public Works Department	Moderate	Private Property Flood Mitigation	>\$1M	Three to five years	Develop as-built information for existing storm drainage system to determine options for mitigation .
M-15	Address identified Repetitive Flood Loss Properties.	Floodplain Administrator	Moderate	Private Property Flood Mitigation	Staff time commitment	Six months	Prior to initiating landowner contacts, identify flood insurance implications and mitigation options including eligible activities per FEMA HMA programs.

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, some SDVR HMP mitigation measures as well as new areas of concern were identified where implementation required participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.15-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.15-4.

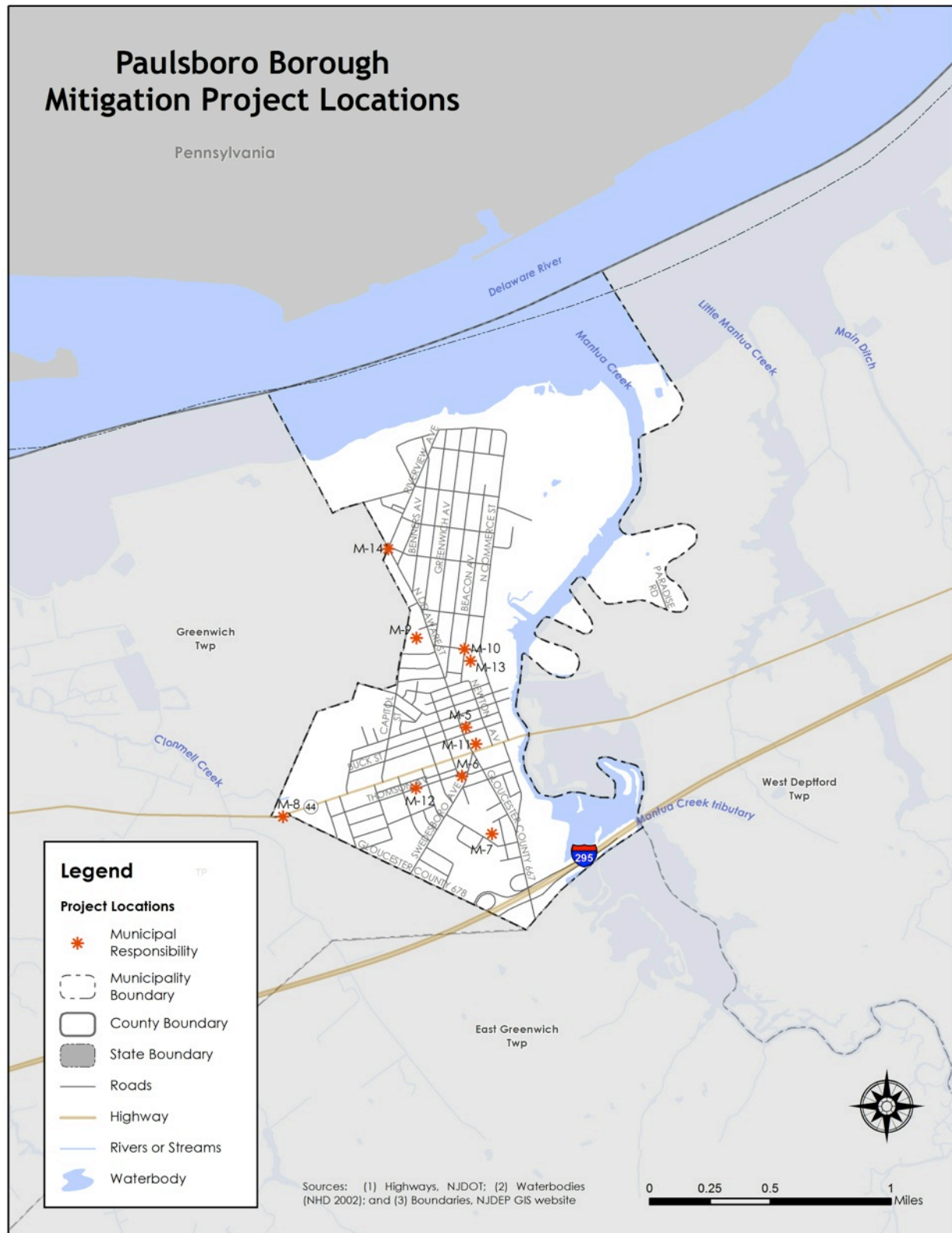
Table GC.15-13: Paulsboro Borough (Gloucester County) Multi-Jurisdictional Mitigation Measures⁵

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1						

⁵ **Note to Draft NJ4 HMP Reviewers:** No multi-jurisdictional mitigation measures were identified during the Work Sessions with the municipality. If no multi-jurisdictional mitigation measure are identified before the Municipal Appendix is ready for adoption, Part 4.5 and Table GC.15-13 will be revised to note the situation but identify that multi-jurisdictional mitigation measures may be identified by the municipality as part of future updates.

Part 4: Mitigation Measures

Figure GC.15-4: Paulsboro Borough Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Paulsboro Borough Emergency Operations Plan (2014)
- Paulsboro Borough Master Plan and Reexamination Reports (2009)
- Paulsboro Borough Land Use and Development Ordinances including Floodplain Management (1955)
- Paulsboro Borough Zoning Map (1999)
- Paulsboro Borough 2014 Capital Improvement Budget and Capital Improvement Program⁶

⁶ <http://www.paulsboronj.org/media/58379/Paulsboro2014Budget.pdf>

Attachment A: Public Review Comments

The following comments were received during the public review of the Paulsboro Borough Municipal Appendix:

Table GC.15.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Paulsboro Borough Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.16
Pitman Borough, New Jersey

May 29, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.16-i
Part 1 Overview	GC.16-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.16-1
1.2: Pitman Borough (Gloucester County) Municipal Appendix	GC.16-1
Part 2 Participation	GC.16-2
2.1: Municipal Working Group Participation	GC.16-2
2.2: Public Participation	GC.16-4
Part 3 Hazard Identification and Risk Assessment	GC.16-5
3.1: Municipal Profile	GC.16-5
3.2: Hazard Priorities	GC.16-9
3.3: Hazard Mapping	GC.16-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.16-11
Part 4 Mitigation Measures	GC.16-16
4.1: Mitigation Goals and Strategy	GC.16-16
4.2: SDVR HMP Mitigation Measures	GC.16-17
4.3: Municipal Mitigation Measures – Identification	GC.16-18
4.4: Municipal Mitigation Measures – Implementation	GC.16-20
4.5: Multi-Jurisdictional Mitigation Measures	GC.16-23
4.6: Plan Review and Integration	GC.16-25

Table of Contents

List of Figures

Figure GC.16-1: Pitman Borough (Gloucester County) Location Map	GC.16-5
Figure GC.16-2: Pitman Borough Base Map	GC.16-6
Figure GC.16-3: Pitman Borough Housing Units by Year Built	GC.16-8
Figure GC.16-4: Pitman Borough Mitigation Project Locations	GC.16-24

List of Tables

Table GC.16-1: Pitman Borough (Gloucester County) Working Group	GC.16-2
Table GC.16-2: Public Participation	GC.16-4
Table GC.16-3: Pitman Borough Demographics	GC.16-7
Table GC.16-4: Pitman Borough Demographic Rankings	GC.16-7
Table GC.16-5: Pitman Borough Economics and Housing	GC.16-7
Table GC.16-6: Pitman Borough Ranking (Economics and Housing)	GC.16-8
Table GC.16-7: Supporting Mapping and Exhibits	GC.16-10
Table GC.16-8: Pitman Borough Critical Facilities Inventory	GC.16-12
Table GC.16-9: Pitman Borough Critical Facilities Hazard Exposure	GC.16-14
Table GC.16-10: Status of Pitman Borough SDVR HMP Mitigation Measures	GC.16-17
Table GC.16-11: Pitman Borough Municipal Mitigation Measures Identification	GC.16-18
Table GC.16-12: Pitman Borough Municipal Mitigation Measures Implementation	GC.16-20
Table GC.16-13: Pitman Borough Multi-Jurisdictional Mitigation Measures	GC.16-23

Attachments

Attachment GC.16.A: Public Review Comments	GC.16.A-1
Attachment GC.16.B: Adoption Resolution	GC.16.B-1
Attachment GC.16.C: Approval Letter	GC.16.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Pitman Borough (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Pitman Borough in Gloucester County, New Jersey.

The Pitman Borough Municipal Working Group recommended the Pitman Borough (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Pitman Borough Council adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.16-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.16-1: Pitman Borough (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
James	Foley	Pitman Borough Office of Emergency Management	OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Mike	Mellet	Pitman Borough Office of Emergency Management	Deputy OEM Coordinator	<input checked="" type="checkbox"/>		
Russ	Johnson	Pitman Borough Executive Committee	Mayor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Judy	O'Donnell	Pitman Borough Clerk's Office	Borough Clerk / Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Provided municipal documents for review.
Jeffrey	Kier	Pitman Borough Construction Office	Construction Official / Floodplain Administrator			Floodplain Administrator reviewed the Preliminary Appendix.
Steven	Alexander	Pitman Borough Public Works	Public Works Manager	<input checked="" type="checkbox"/>		
Matt	Paden	Pitman Borough Water & Sewer Department	Water Department Foreman		<input checked="" type="checkbox"/>	
Kevin	Austin	Pitman Borough Public Safety	Director of Public Safety	<input checked="" type="checkbox"/>		

¹ Round 1 Work Session was held on August 14, 2014.

² Round 2 Work Session was held on October 23, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.16-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Gregory	Owens	Pitman Borough Police Department	Sergeant Police Officer	<input checked="" type="checkbox"/>		
Christopher	Leach	Pitman Borough Police Department	Patrolman		<input checked="" type="checkbox"/>	

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Land Use / Economic Development Planner
- Engineering
- Fire
- Business Associations
- Community / Faith-Based Organizations
- Healthcare Institutions
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Emergency Medical Services
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Major Employers and Businesses

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.16-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.16-2: Public Participation

Date	Type of Involvement	Location
December 15, 2014	Link to Project Website (http://nj4hmp.com) established and Preliminary Municipal Appendix posted to website for public comment	Pitman Borough Office of Emergency Management webpage ⁵
December 24, 2014	Public outreach	Pitman Borough facebook page
May 11, 2015	Public hearing included on Pitman Borough Council agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Pitman Borough Hall
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁶ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁷

⁵ <http://www.pitman.org/office-of-emergency-management.html>

⁶ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁷ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

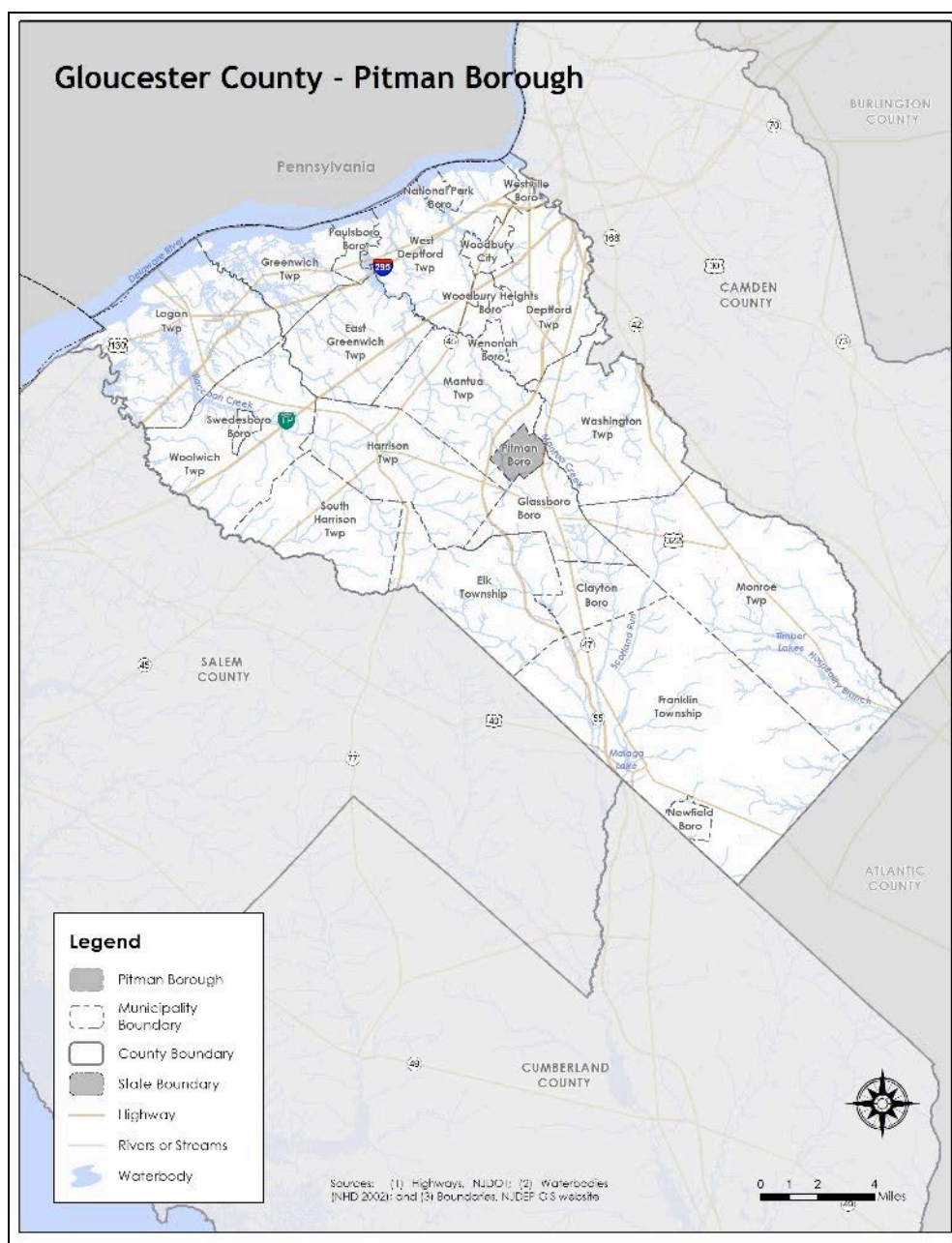
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Pitman Borough is located in the central part of Gloucester County (See Figure GC.16-1).

Figure GC.16-1: Pitman Borough (Gloucester County) Location Map

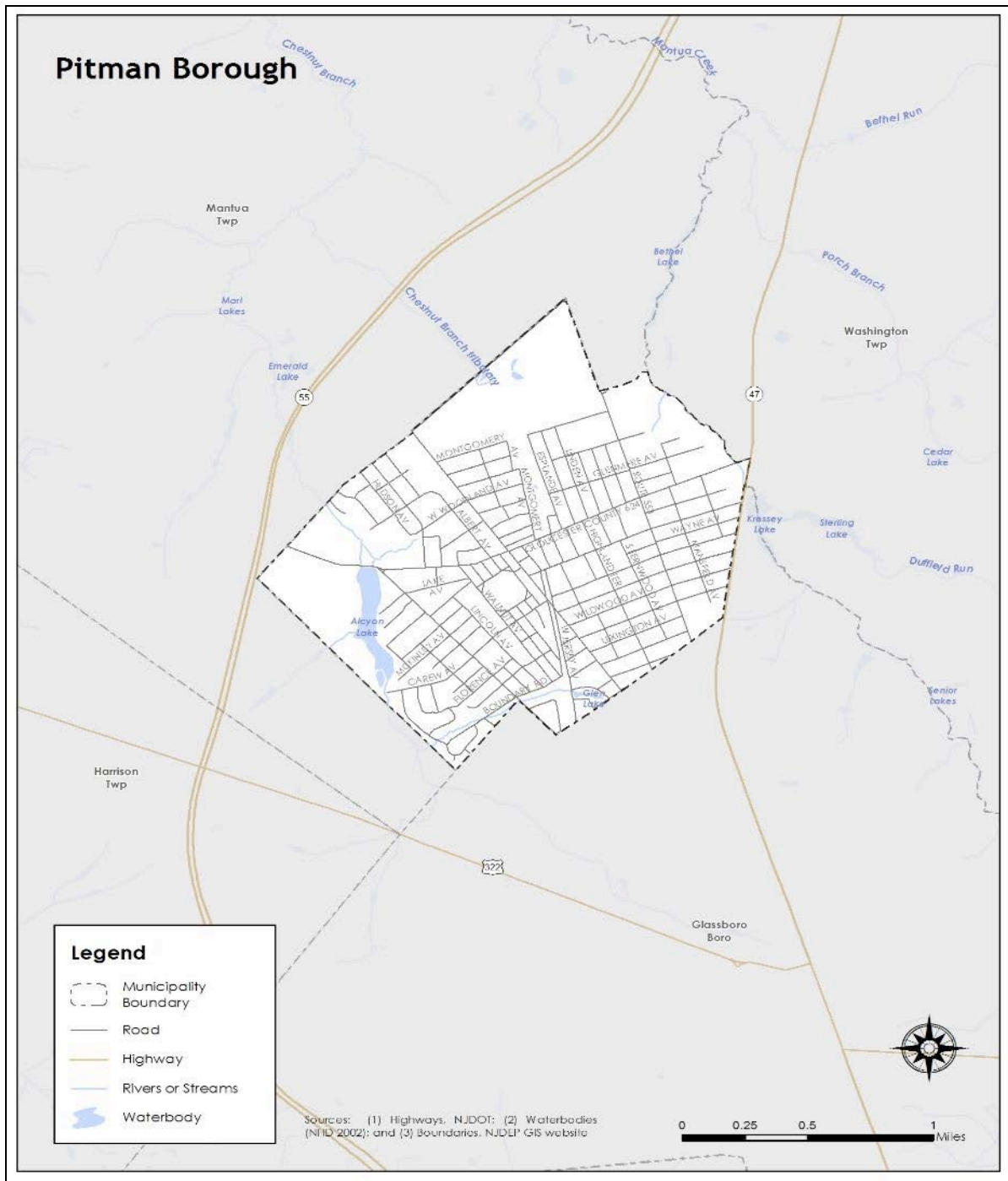


Part 3: Hazard Identification and Risk Assessment

Pitman Borough is a rural community with growing commercial and residential areas.

Per Figure GC.16-2, the major water bodies include Alcyon Lake, Glen Lake, and Mantua Creek. Major transportation routes include State Highway 47 and Gloucester County Routes 553 and 624 (East Holly Avenue, West Holly Avenue, & Cedar Avenue). Additionally, Conrail railroad tracks run through the center of municipality. The land is gently rolling.

Figure GC.16-2: Pitman Borough Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.16-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.16-3: Pitman Borough Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Pitman Borough	Gloucester County	Region	New Jersey
2000 Population	9,331	254,673	974,328	8,414,350
2010 Population	9,011	288,288	1,024,926	8,791,894
Percent Change	-3.43%	13.2%	5.19%	4.49%
Population Density	3,976.1 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	2.27 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	22.4	24.4	24.1	23.5
% of Population 18 - 64	60.7	63.2	62.7	63
% of Population 65 and over	16.9	12.4	13.2	13.5

Table GC.16-4 illustrates how Pitman Borough ranks in the county, the four county region, and New Jersey.

Table GC.16-4: Pitman Borough Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	12	31	254
Land Area Rank	16	56	371
Population Density Rank	3	23	153
Population Change Rank	21	74	-

Table GC.16-5 includes information related to economic and housing statistics for Pitman Borough, Gloucester County, the four county region, and New Jersey.

Table GC.16-5: Pitman Borough Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Pitman Borough	Gloucester County	Region	New Jersey
Date Incorporated	May 24, 1905	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$67,234	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	3,705	109,796	397,990	3,529,033
Occupied Housing Units	3,489	104,271	372,472	3,176,069
Vacant Housing Units	216	5,525	25,518	352,964
Owner Occupied Housing Units	2,552	83,525	266,593	2,126,279
Renter occupied Housing Units	937	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Pitman Borough	Gloucester County	Region	New Jersey
Building Permits	1	716	1,554	13,535
Largest Industry	Educational Services, and Health Care and Social Assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

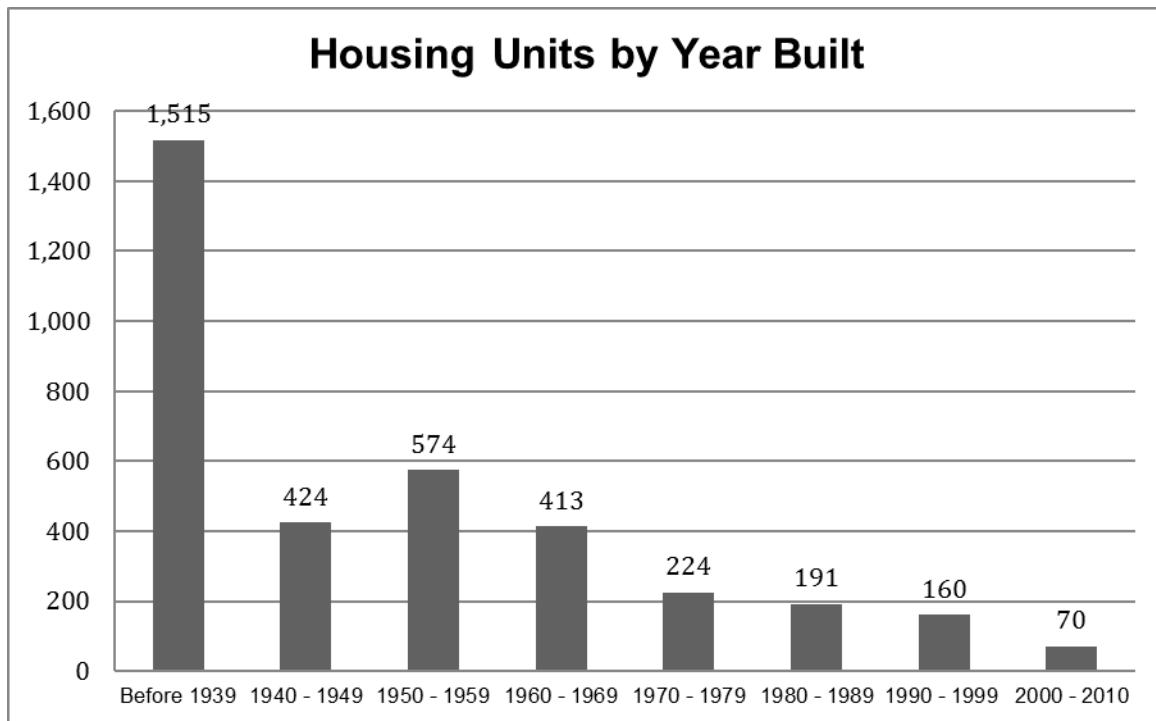
Table GC.16-6 illustrates how Pitman Borough ranks in the county and the four county region.

Table GC.16-6: Pitman Borough Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	13	33
Vacant Housing Rank	10	30
Renter Occupied Housing Rank	8	30
Building Permits Rank	19	69

Figure GC.16-3 illustrates development patterns in Pitman Borough by examining housing units by year built. Nearly 19% of homes in Pitman Borough were built during the 1950s.

Figure GC.16-3: Pitman Borough Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Flood
- High Wind
- Severe Weather - Summer

Moderate Priority

- Severe Weather – Winter

Low Priority

- Dam Failure
- Drought
- Earthquake
- Extreme Temperature: Hot & Cold
- Wildfire

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Levee Failure

¹ See *Section 3: Hazard Identification and Risk Assessment*.

Part 3: Hazard Identification and Risk Assessment

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.16-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.16-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.16-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.16-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.16-8: Pitman Borough (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Borough Hall	Municipal	Administrative Offices	110 South Broadway, Pitman		Y	Y		
CF-2	Emergency Operations Center	EOC	Co-located Facilities	110 South Broadway, Pitman	CF-1	Y	Y		
CF-3	Police Station	Law Enforcement Facilities	Stations	110 South Broadway, Pitman	CF-1	Y	Y	Includes a holding cell	
CF-4	Highland Chemical Engine Company	FireStation	Stations	109 East Woodland, Pitman Avenue		Y ²	Y		
CF-5	Pitman Fire Company #1	FireStation	Stations	1 Commerce Avenue, Pitman		Y ²	Y		
CF-6	Public Works	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	599 Elwood Avenue, Pitman		N	N ³		M-5 / M-20
CF-7	Sewer Lift Station	Utilities – Wastewater	Pump Stations / Lift Stations	Lakeview Avenue, Pitman		N/A	N		M-6
CF-8	Sewer Lift Station	Utilities – Wastewater	Pump Stations / Lift Stations	Lambs Road, Pitman		N/A	N		M-7
CF-9	Water Tower	Utilities – Water	Water Towers	Laurel & Westley Avenue, Pitman		N/A	N		
CF-10	Water Tower	Utilities – Water	Water Towers	15 North Summitt Avenue, Pitman		N/A	N		
CF-11	Pump Station	Utilities – Water	Pump Stations	213 Lincoln Avenue, Pitman		N/A	Y		M-18 / M-21
CF-12	Pump Station	Utilities – Water	Pump Stations	Edgemore Avenue & Lindon Avenue, Pitman		N/A	Y		M-19 / M-21
CF-13	Elwood Kindle Elementary School	Schools	Public Schools	211 Washington Avenue, Pitman		Y	N		M-8
CF-14	W.C.K. Walls Elementary School	Schools	Public Schools	320 Grant Avenue, Pitman		Y	N		M-9
CF-15	Memorial Elementary School	Schools	Public Schools	400 Hudson Avenue, Pitman		Y	N		M-10

² Shelter of last resort

³ Facility is supported by portable generator

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-16	Pitman High School	Schools	Public Schools	225 Linden Avenue, Pitman		Y ⁴	Y		
CF-17	The First Presbyterian Church in Pitman Preschool	Vulnerable Populations Facilities	Private Child Day Care	10 Wildwood Avenue, Pitman		Y ⁴	N		M-11
CF-18	Pitman United Methodist Church	Vulnerable Populations Facilities	Private Child Day Care	758 North Broadway, Pitman		Y	Y	Red Cross designated shelter	
CF-19	Pitman Manor	Vulnerable Populations Facilities	Private Nursing Homes	535 North Oak Avenue, Pitman		N	Y	Two buildings at this location	
CF-20	Brookfield Group Home	Vulnerable Populations Facilities	Private / Non-Profit Group Homes	149 Brookfield Avenue, Pitman		Y ⁴	N		M-12
CF-21	Alcyon Group Home	Vulnerable Populations Facilities	Private / Non-Profit Group Homes	523 Alcyon Boulevard, Pitman		Y ⁴	N		M-13
CF-22	Grandview Group Home	Vulnerable Populations Facilities	Private / Non-Profit Group Homes	603 Grandview Avenue, Pitman		Y ⁴	N		M-14

⁴ Shelter in place

Part 3: Hazard Identification and Risk Assessment

Table GC.16-9: Pitman Borough (Gloucester County) Critical Facilities Hazard Exposure⁵

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface Wildfire Extreme / High Fuel Level Risk
CF-1	Borough Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-3	Police Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-4	Highland Chemical Engine Company	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-5	Pitman Fire Company #1	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-6	Public Works	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-7	Sewer Lift Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-8	Sewer Lift Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-9	Water Tower	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-10	Water Tower	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-11	Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-12	Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-13	Elwood Kindle Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-14	W.C.K. Walls Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-15	Memorial Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-16	Pitman High School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-17	The First Presbyterian Church in Pitman Preschool	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-18	Pitman United Methodist Church	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-19	Pitman Manor	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	

⁵ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface Wildfire Extreme / High Fuel Level Risk
CF-20	Brookfield Group Home	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-21	Alcyon Group Home	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	
CF-22	Grandview Group Home	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A	

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.16-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.16-10.

Table GC.16-10: Status of Pitman Borough (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Pitman 1: Engineering study to determine mitigation action for flooding on Howard Avenue, Lakeside Avenue, Lake Avenue, and Pointsett Avenue.	Not completed, not funded.	Issue is no longer considered valid. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Pitman 2: Monitor dam failure and flood risk/threat related to Alcyon Dam.	Completed.	Issue was resolved through municipal capital improvement funds used to upgrade the dam. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A

Table GC.16-10 Notes:

- A. See Tables GC.16-11 and GC.16-12 for municipal (M-#) mitigation measures
- B. See Table GC.16-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.16-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Note: Pitman Borough does not currently have RL or SRL properties per information provided by the New Jersey Department of Environmental Protection.

Table GC.16-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.16-4.

Table GC.16-11: Pitman Borough (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.²	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #2	Existing

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-5	Install permanent back-up emergency power generator at Public Works Garage (CF-6).	All	Goal #4	Both
M-6	Install permanent back-up emergency power generator at Wastewater Sewer Lift Station on Lakeview Avenue (CF-7).	All	Goal #4	Both
M-7	Install permanent back-up emergency power generator at Wastewater Sewer Lift Station on Lambs Road (CF-8). ³	All	Goal #4	Both
M-8	Install permanent back-up emergency power generator at Elwood Kindle Elementary School (CF-13).	All	Goal #4	Both
M-9	Install permanent back-up emergency power generator at W.C.K. Walls Elementary School (CF-14).	All	Goal #4	Both
M-10	Install permanent back-up emergency power generator at Memorial Elementary School (CF-15).	All	Goal #4	Both
M-11	Install permanent back-up emergency power generator at The First Presbyterian Church in Pitman Preschool (CF-17).	All	Goal #4	Both
M-12	Support acquisition and installation of permanent back-up emergency power generator at Brookfield Group Home (CF-20).	All	Goal #4	Both
M-13	Support acquisition and installation of permanent back-up emergency power generator at Alcyon Group Home (CF-21).	All	Goal #4	Both
M-14	Support acquisition and installation of permanent back-up emergency power generator at Grandview Group Home (CF-22).	All	Goal #4	Both
M-15	Engineering study to identify drainage capacity and requirements for upgrades at Pitman Avenue & Commerce Avenue. ³	Flood	Goal #4	Existing
M-16	Engineering study to identify drainage capacity and requirements for upgrades at West Jersey Avenue & Grandview Avenue. ³	Flood	Goal #4	Existing
M-17	Improve drainage system on Spruce Avenue.	Flood	Goal #4	Both
M-18	Harden / retrofit water pump station at Lincoln Avenue (CF-11).	High Wind	Goal #4	Both
M-19	Harden / retrofit water pump station at Edgemore Avenue and Lindon Avenue (CF-12).	High Wind	Goal #4	Both
M-20	Harden / retrofit Public Works garage to include upgrade to roof (CF-6).	High Wind	Goal #4	Both
M-21	Hazard threat assessment related to water pump stations located at Lincoln Avenue / Edgemore Avenue and Lindon Avenue (CF-11 / CF-12). ⁴	Risk / Threat Assessment	Goal #4	Both

³ Project included in Letter of Interest (LOI) for DR 4086 HMGP. LOI project #1231 budget = \$500,000.00.

⁴ Although natural hazards are the focus of the NJ4 HMP, these technological hazards are a continuing concern to the community and are documented in the Municipal Appendix to reflect the full range of hazards within Pitman Borough.

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.16-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria⁵
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁶
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.16-12: Pitman Borough (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	High	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	High	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	High	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	High	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.

⁵ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁶ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Install permanent back-up emergency power generator at Public Works garage (CF-6).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conducting project scoping.
M-6	Install permanent back-up emergency power generator at Wastewater Sewer Lift Station on Lakeview Avenue (CF-7).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conducting project scoping.
M-7	Install permanent back-up emergency power generator at Wastewater Sewer Lift Station on Lambs Road (CF-8).	Municipal OEM and Public Works Department	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conducting project scoping.
M-8	Install permanent back-up emergency power generator at Elwood Kindle Elementary School (CF-13).	Municipal OEM and Board of Education	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conducting project scoping.
M-9	Install permanent back-up emergency power generator at W.C.K. Walls Elementary School (CF-14).	Municipal OEM and Board of Education	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conducting project scoping.
M-10	Install permanent back-up emergency power generator at Memorial Elementary School (CF-15).	Municipal OEM and Board of Education	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conducting project scoping.
M-11	Install permanent back-up emergency power generator at The First Presbyterian Church in Pitman and Municipal OEM	The First Presbyterian Church in Pitman and Municipal OEM	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conducting project scoping.
M-12	Support acquisition and installation of permanent back-up emergency power generator at Brookfield Group Home (CF-20).	Brookfield Group Home and Municipal OEM	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conducting project scoping.
M-13	Support acquisition and installation of permanent back-up emergency power generator at Alcyon Group Home (CF-21).	Alcyon Group Home and Municipal OEM	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conducting project scoping.
M-14	Support acquisition and installation of permanent back-up emergency power generator at Grandview Group Home (CF-22).	Grandview Group Home and Municipal OEM	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conducting project scoping.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-15	Engineering study to identify drainage capacity and requirements for upgrades at Pitman Avenue & Commerce Avenue.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	< \$50K	One to three years	Develop scope of work and procure professional consulting services.
M-16	Engineering study to identify drainage capacity and requirements for upgrades at West Jersey Avenue & Grandview Avenue.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	< \$50K	One to three years	Develop scope of work and procure professional consulting services.
M-17	Improve drainage system on Spruce Avenue.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	< \$100K	One to three years	Conducting project scoping. ⁷
M-18	Harden / retrofit water pump station at Lincoln Avenue (CF-11).	Municipal OEM and Public Works Department	High	Building Retrofit	\$100K - \$500K	One to three years	Conducting project scoping.
M-19	Harden / retrofit water pump station at Edgemore Avenue and Lindon Avenue (CF-12).	Municipal OEM and Public Works Department	High	Building Retrofit	\$100K - \$500K	One to three years	Conducting project scoping.
M-20	Harden / retrofit Public Works garage to include upgrade to roof (CF-6).	Municipal OEM and Public Works Department	High	Building Retrofit	\$100K - \$500K	One to three years	Conducting project scoping.
M-21	Hazard threat assessment related to water pump stations located at Lincoln Avenue / Edgemore Avenue and Lindon Avenue (CF-11 / CF-12).	Municipal OEM	High	Risk / Threat Assessment	< \$50K	One to three years	Develop scope of work for risk / threat assessment and procure professional consulting services.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.16-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.16-4.

Table GC.16-13: Pitman Borough (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Dredging of storm drains at Alcyon Boulevard and Cedar Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	High
MJ-2	Improve storm drainage at Cedar Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	High
MJ-3	Improve storm drainage at County Route 553 (South Broadway) & Adams Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-4	Improve storm drainage at County Route 624 (East Holly Avenue) and South Brentwood Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate

Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Drainage Control Ordinance
- Economic Development Strategic Plan (2010)⁷
- Emergency Operations Plan – Base Plan
- Flood Control (2009)
- Flood Damage Prevention Ordinance (1982)
- Master Plan (2002)
- Stormwater Management Ordinance
- Stormwater Management Plan (2006)
- Zoning Map (2011)⁸

⁷ <http://www.pitman.org/userfiles/Economic%20Plan.pdf>

⁸ <http://www.pitman.org/userfiles/Pitman%20Zoning%20Map.pdf>

Attachment A: Public Review Comments

The following comments were received during the public review of the Pitman Borough Municipal Appendix:

Table GC.16.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of May 29, 2015, no public review comments were received for the Pitman Borough Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.17
South Harrison Township, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.17-i
Part 1 Overview	GC.17-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.17-1
1.2: South Harrison Township (Gloucester County) Municipal Appendix	GC.17-1
Part 2 Participation	GC.17-2
2.1: Municipal Working Group Participation	GC.17-2
2.2: Public Participation	GC.17-4
Part 3 Hazard Identification and Risk Assessment	GC.17-5
3.1: Municipal Profile	GC.17-5
3.2: Hazard Priorities	GC.17-9
3.3: Hazard Mapping	GC.17-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.17-11
Part 4 Mitigation Measures	GC.17-14
4.1: Mitigation Goals and Strategy	GC.17-14
4.2: SDVR HMP Mitigation Measures	GC.17-15
4.3: Municipal Mitigation Measures – Identification	GC.17-16
4.4: Municipal Mitigation Measures – Implementation	GC.17-19
4.5: Multi-Jurisdictional Mitigation Measures	GC.17-21
4.6: Plan Review and Integration	GC.17-24

Table of Contents

List of Figures

Figure GC.17-1: South Harrison Township (Gloucester County) Location Map	GC.17-5
Figure GC.17-2: South Harrison Township Base Map	GC.17-6
Figure GC.17-3: South Harrison Township Housing Units by Year Built	GC.17-8
Figure GC.17-4: South Harrison Township Mitigation Project Locations	GC.17-23

List of Tables

Table GC.17-1: South Harrison Township (Gloucester County) Working Group	GC.17-2
Table GC.17-2: Public Participation	GC.17-4
Table GC.17-3: South Harrison Township Demographics	GC.17-7
Table GC.17-4: South Harrison Township Demographic Rankings	GC.17-7
Table GC.17-5: South Harrison Township Economics and Housing	GC.17-7
Table GC.17-6: South Harrison Township Ranking (Economics and Housing)	GC.17-8
Table GC.17-7: Supporting Mapping and Exhibits	GC.17-10
Table GC.17-8: South Harrison Township Critical Facilities Inventory	GC.17-12
Table GC.17-9: South Harrison Township Critical Facilities Hazard Exposure	GC.17-13
Table GC.17-10: Status of South Harrison Township SDVR HMP Mitigation Measures	GC.17-15
Table GC.17-11: South Harrison Township Municipal Mitigation Measures Identification	GC.17-16
Table GC.17-12: South Harrison Township Municipal Mitigation Measures Implementation	GC.17-19
Table GC.17-13: South Harrison Township Multi-Jurisdictional Mitigation Measures	GC.17-22

Attachments

Attachment GC.17.A: Public Review Comments	GC.17.A-1
Attachment GC.17.B: Adoption Resolution	GC.17.B-1
Attachment GC.17.C: Approval Letter	GC.17.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: South Harrison Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on South Harrison Township in Gloucester County, New Jersey.

The South Harrison Township Municipal Working Group recommended the South Harrison Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The South Harrison Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.17-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.17-1: South Harrison Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Work Session ³	Contribution ⁴
Thomas	Luchay	South Harrison Township OEM	Emergency Management Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
James	McCall	South Harrison Township Committee	Mayor			<input checked="" type="checkbox"/>	
Robert	Diaz	South Harrison Township Committee	Deputy Mayor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Robert	Schenk	South Harrison Township Committee	Committeeman		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
John	Horner	South Harrison Township Committee	Committeeman			<input checked="" type="checkbox"/>	
Mary	Howard	South Harrison Township Committee	Committeewoman		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Charles S.	Bach, Jr.	South Harrison Township Engineer	Township Engineer / Floodplain Administrator			<input checked="" type="checkbox"/>	
Nancy	Kearns	South Harrison Township Administration	Municipal Clerk			<input checked="" type="checkbox"/>	
Brian	Lozuke	South Harrison Township Solicitor	Solicitor			<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on July 16, 2014.

² Round 2 Work Session was held on October 21, 2014.

³ South Harrison Township Committee Meeting & Working Group Meeting was held on December 9, 2014.

⁴ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.17-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Work Session ³	Contribution ⁴
Jon	Sukeforth	South Harrison Township Public Works	Public Works Supervisor	<input checked="" type="checkbox"/>			
Nicholas	Priore	South Harrison Police Department	Chief of Police	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Chris	Rosser	Gloucester County EMS	Lieutenant		<input checked="" type="checkbox"/>		

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁵

- Land Use / Economic Development Planner
- Building Code Official
- Engineering
- Major Employers and Businesses
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Business Associations
- Community / Faith-Based Organizations
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Healthcare Institutions

⁵ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.17-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.17-2: Public Participation

Date	Type of Involvement	Location
August 7, 2014	Link to Project Website (http://nj4hmp.com) established	Welcome to South Harrison Township! ⁶
September 10, 2014	Public meeting with presentation and open discussion	South Harrison Township Municipal Building
September 15, 2014	Flyers posted	South Harrison Township Municipal Building
November 26, 2014	Preliminary Municipal Appendix posted to website for public comment	Welcome to South Harrison Township! Upcoming Events and Important Announcements ⁷
December 10, 2014	Public hearing included on South Harrison Township Committee agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	South Harrison Township Municipal Building
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁸ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁹

⁶ <http://www.southharrison-nj.org/links.shtml>

⁷ http://www.southharrison-nj.org/important_announcements.shtml#comm-meetings

⁸ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁹ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

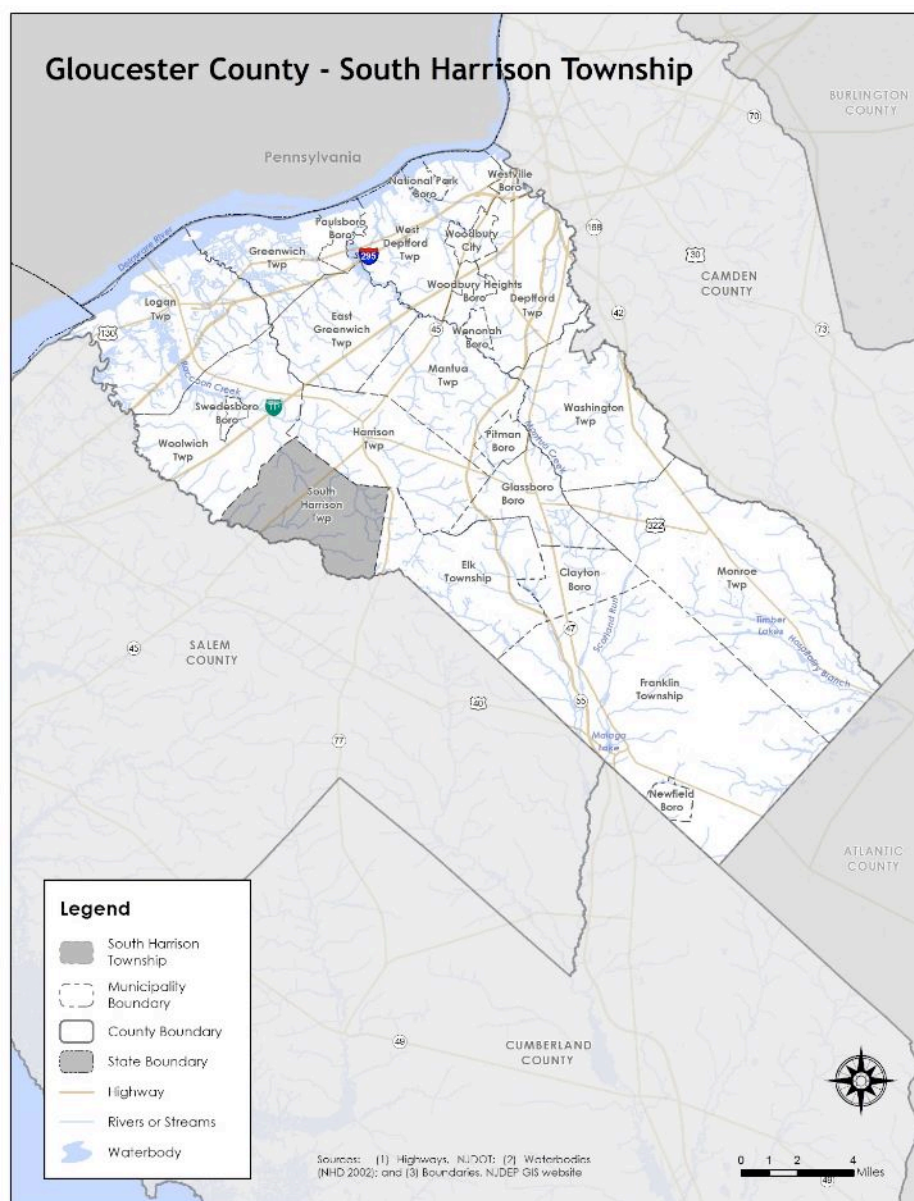
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

South Harrison Township is located in the western part of Gloucester County (See Figure GC.17-1).

Figure GC.17-1: South Harrison Township (Gloucester County) Location Map

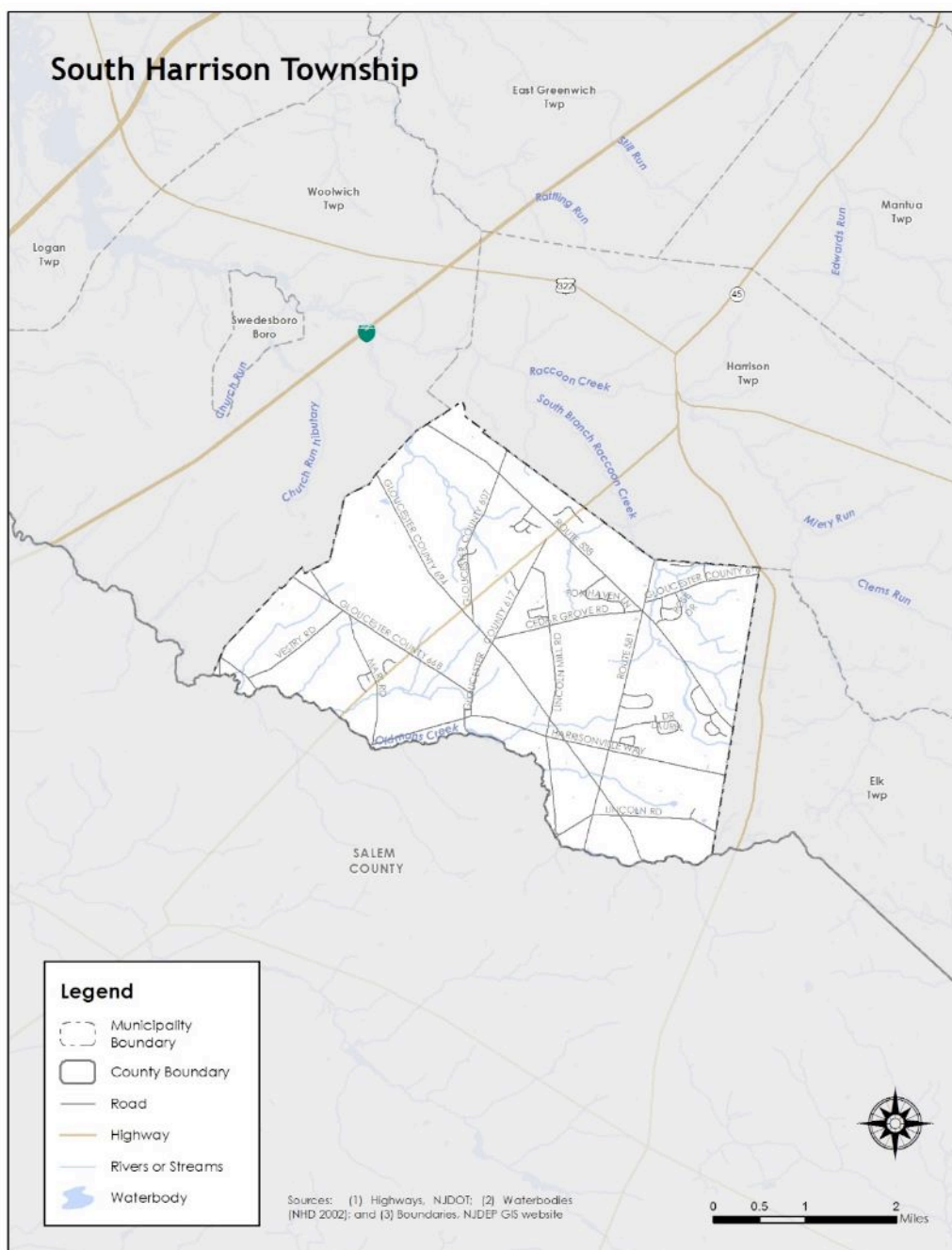


Part 3: Hazard Identification and Risk Assessment

South Harrison Township is a rural “bedroom” community. Along with its agricultural characteristics, South Harrison Township continues to develop its residential and retail areas. An unincorporated community in the municipality is Harrisonville.

Per Figure GC.17-2, the major water courses include South Branch Raccoon Creek and Oldmans Creek. Major transportation routes State Highway 45 and Gloucester County Routes 694, 538, and 581. The land is predominantly flat.

Figure GC.17-2: South Harrison Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.17-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.17-3: South Harrison Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	South Harrison Township	Gloucester County	Region	New Jersey
2000 Population	2,417	254,673	974,328	8,414,350
2010 Population	3,162	288,288	1,024,926	8,791,894
Percent Change	30.82%	13.2%	5.19%	4.49%
Population Density	201.7 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	15.68 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	28.7	24.4	24.1	23.5
% of Population 18 - 64	60.9	63.2	62.7	63
% of Population 65 and over	10.4	12.4	13.2	13.5

Table GC.17-4 illustrates how South Harrison Township ranks in the county, the four county region, and New Jersey.

Table GC.17-4: South Harrison Township Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	19	64	445
Land Area Rank	10	36	164
Population Density Rank	24	71	504
Population Change Rank	4	4	-

Table GC.17-5 includes information related to economic and housing statistics for South Harrison Township, Gloucester County, the four county region, and New Jersey.

Table GC.17-5: South Harrison Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	South Harrison Township	Gloucester County	Region	New Jersey
Date Incorporated	March 2, 1883	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$106,667	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	1,056	109,796	397,990	3,529,033
Occupied Housing Units	1,020	104,271	372,472	3,176,069
Vacant Housing Units	36	5,525	25,518	352,964
Owner Occupied Housing Units	969	83,525	266,593	2,126,279

Part 3: Hazard Identification and Risk Assessment

	South Harrison Township	Gloucester County	Region	New Jersey
Renter Occupied Housing Units	51	20,746	105,879	1,049,790
Building Permits	12	716	1,554	13,535
Largest Industry	Agriculture, Forestry, Fishing and Hunting; Educational Services; and Transportation and Warehousing	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

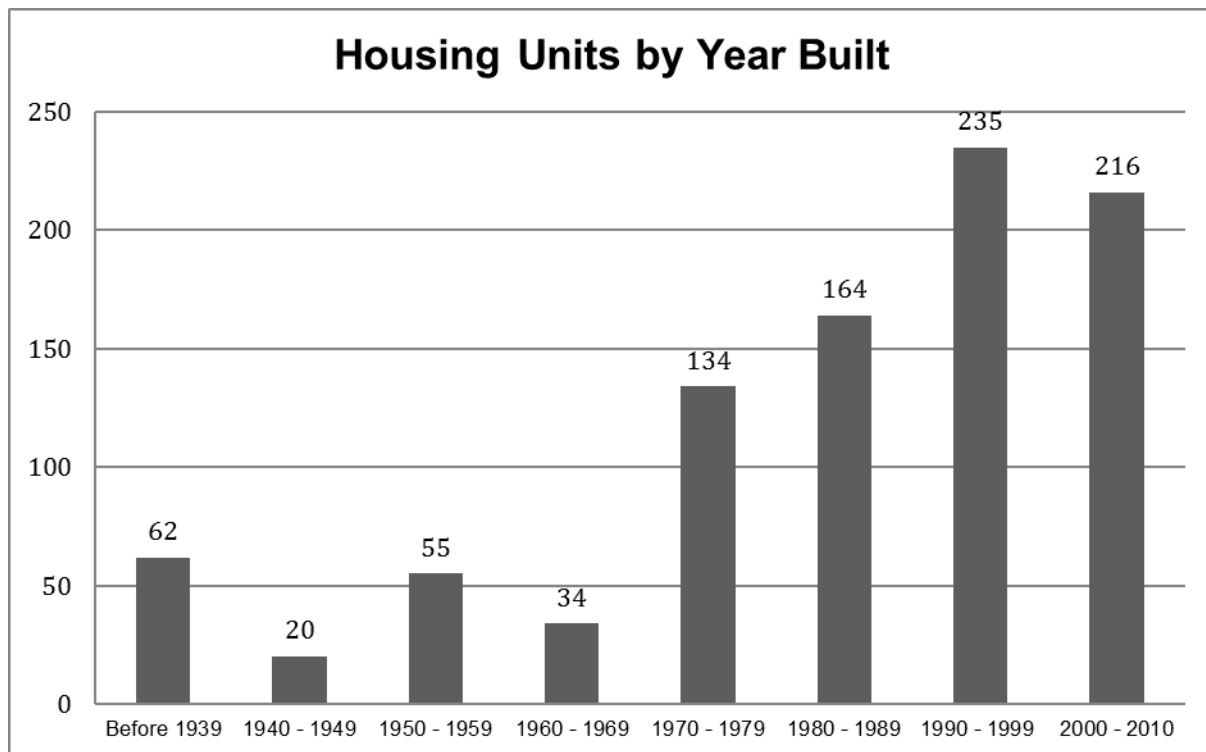
Table GC.17-6 illustrates how South Harrison Township ranks in the county and the four county region.

Table GC.17-6: South Harrison Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	2	4
Vacant Housing Rank	23	83
Renter Occupied Housing Rank	24	87
Building Permits	11	28

Figure GC.17-3 illustrates development patterns in South Harrison Township by examining housing units by year built. About 22% of homes in South Harrison Township were built during the 1990s.

Figure GC.17-3: South Harrison Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Drought
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Moderate Priority

- Extreme Temperature: Cold & Hot
- Flood

Low Priority

- Dam Failure
- Earthquake
- Wildfire

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Levee Failure

¹ See *Section 3: Hazard Identification and Risk Assessment*.

Part 3: Hazard Identification and Risk Assessment

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.17-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.17-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.17-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.17-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.17-8: South Harrison Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Township Hall	Municipal	Administrative Offices	664 Harrisonville Road, Harrisonville		Y	Y		M-12
CF-2	Emergency Operations Center	EOC	Co-located Facilities	664 Harrisonville Road, Harrisonville	CF-1	Y	Y		
CF-3	Police Station	Law Enforcement Facilities	Stations	664 Harrisonville Road, Harrisonville	CF-1	Y	Y		
CF-4	Harrisonville Fire Department	FireStation	Stations	30 Main Street, Harrisonville		N	Y ^{2 3}		M-5 / M-9 / M-13
CF-5	Public Works	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	664 Harrisonville Road, Harrisonville	CF-1	Y	Y		
CF-6	South Harrison Elementary School	Schools	Public Schools	904 Mullica Hill Road, Harrisonville / P.O. Box 112		Y	Y ²		M-6 / M-14 / M-15

² Back-up generator provides partial building coverage for emergency lighting.

³ Harrisonville Fire Department has a portable generator.

Part 3: Hazard Identification and Risk Assessment

Table GC.17-9: South Harrison Township (Gloucester County) Critical Facilities Hazard Exposure⁴

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Township Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-3	Police Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-4	Harrisonville Fire Department	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-5	Public Works	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-6	South Harrison Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

⁴ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.17-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.17-10.

Table GC.17-10: Status of South Harrison Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
South Harrison 1: Engineering study to determine appropriate flood mitigation action and envelope hardening/improved load path for Fire/EMS building, Municipal building, and South Harrison Elementary School located on Main Street.	Not completed, not funded	Revised mitigation measure included in updated Municipal Appendix.	M-12 / M-13 / M-14
South Harrison 2: Public education and outreach program for residents in trailer park (between Mullica Hill Road and Cedar Grove) for hurricane/evacuation strategies.	Work-in-progress	This issue is an ongoing effort. Therefore, mitigation measure is included in updated Municipal Appendix.	M-1
South Harrison 3: Assess wind risk to communications tower (repeater tower).	Not completed, not funded	Multi-jurisdictional mitigation measure is included in updated Municipal Appendix.	MJ-2

Table GC.17-10 Notes:

- A. See Tables GC.17-11 and GC.17-12 for municipal (M-#) mitigation measures
- B. See Table GC.17-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.17-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Note: South Harrison Township does not currently have RL or SRL properties per information provided by the New Jersey Department of Environmental Protection.

Table GC.17-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.17-4.

Table GC.17-11: South Harrison Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures	Basis / Rationale ²
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.³• Target outreach campaign to residents in Home Park located between Mullica Hill Road and Cedar Grove regarding hurricane / evacuation strategies.	All	Goal #1	Both	The primary concern is damage during a hurricane, especially in vulnerable areas, such as the trailer park. Public alerting, warning and communication is identified as a risk concern.

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² **Note to Draft NJ4 HMP Reviewers:** South Harrison Township Municipal Working Group added a column to Table GC.17-11 titled “Basis / Rationale”. In this column, the Municipal Working Group identifies the reasoning and importance of each outlined mitigation measure to the community for future reference.

³ For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures	Basis / Rationale ²
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing	Are our facilities able to withstand hurricane force winds? An assessment should be conducted to determine the structural capabilities of our critical facilities.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #2	Existing	With limited ingress/egress routes, most hazards can result in isolation of residents and critical facilities. Past weather events that have led to flooding and damage to roadways should be reviewed in order to manage storm water runoff. Flooded roadways impede first responders and any evacuations that may be necessary.
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both	Periodic meetings to keep focus on the plan, improve communications; and awareness.
M-5	Install permanent backup emergency power generator at Harrisonville Fire Department (CF-4).	All	Goal #4	Both	The fire department does not have a hard wired permanent emergency backup generator, which has affected operations during power outages.
M-6	Upgrade permanent backup emergency power generator at South Harrison Elementary School (CF-6).	All	Goal #4	Both	The school, as a shelter, only has backup power for a small portion of the building (cafeteria area only). The facility would need to provide power/access to additional rooms/areas if longer term sheltering is desired.
M-7	Develop and implement tree maintenance plan to assist with the reduction of power outages, damages to homes, and evacuation issues.	All	Goal #4	Both	Power distribution system follows roadways that have a heavy tree canopy. Downed trees and limbs constitute a major cause for power outages as well as access/egress route blockages during any significant storm. Either tree trimming or rerouting power lines underground should be evaluated. During a large storm, power could be out for days before the power company can clear the roadway and restore power.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures	Basis / Rationale ²
M-8	Upgrade fuel storage capacity within South Harrison Township.	All	Goal #4	Both	Current fuel storage (Gasoline and Diesel fuel) is very limited at the municipal building. Fuel supply for emergency vehicle use is only sufficient for a few days.
M-9	Upgrade water tank storage capacity for use by the Harrisonville Fire Department (CF-4).	All	Goal #4	Both	This Township does not have any hydrants. The nearest large water supply is Harrisonville Lake. The logistics of running hose from the Lake, through a relay pumper, to one of our critical facilities will take time to set up. A 10,000 gallon tank, similar to ones already installed in the Township, will enable a more effective fire response for our critical facilities and residents of the town.
M-10	Upgrade culverts along Porches Mill Road.	Flood / Severe Storm – Winter Weather / Severe Storm – Summer Weather	Goal #4	Both	Upgrade culverts in known flooding problem areas.
M-11	Upgrade culverts at Marl Road.	Flood / Severe Storm – Winter Weather / Severe Storm – Summer Weather	Goal #4	Both	Upgrade culverts in known flooding problem areas.
M-12	Harden / retrofit infrastructure and loading path for Township Hall located on Harrisonville Road (CF-1).	High Wind	Goal #4	Both	Evaluate and upgrade a critical facility for high wind events.
M-13	Harden / retrofit infrastructure and loading path for Harrisonville Fire Department building located on Harrisonville Road (CF-4).	High Wind	Goal #4	Both	Evaluate and upgrade a critical facility for high wind events.
M-14	Harden / retrofit infrastructure and loading path for South Harrison Elementary School located on Harrisonville Road (CF-6).	High Wind	Goal #4	Both	Evaluate and upgrade a critical facility for high wind events.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures	Basis / Rationale ²
M-15	Upgrade South Harrison Elementary School security system, specifically camera capabilities to better protect students and employees (CF-6). ⁴	Terrorism	Goal #4	Both	Provide additional security measures for the public school.

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.17-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria⁵
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁶
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.17-12: South Harrison Township (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies) ⁷	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Low	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Low	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.

⁴ **Note to Draft NJ4 HMP Reviewers:** Although natural hazards are the focus of the NJ4 HMP, technological hazards are a continuing concern to the community and are documented in the Municipal Appendix to reflect the full range of hazards within South Harrison Township.

⁵ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁶ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

⁷ South Harrison Township and other outlined responsible parties cannot commit to any of the projects outlined within the Update Hazard Mitigation Plan unless funds are provided.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies) ⁷	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	Low	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Low	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.
M-5	Install permanent backup emergency power generator at Harrisonville Fire Department (CF-4).	Municipal OEM and Fire Department	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Install permanent backup emergency power generator at South Harrison Elementary School (CF-6).	Municipal OEM and School Board	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-7	Develop and implement tree maintenance plan to assist with the reduction of power outages, damages to homes, and evacuation issues.	Municipal OEM and Public Works Department	Moderate	Public Property Mitigation	\$50K - \$100K	Three to five years	Conduct project scoping.
M-8	Upgrade fuel storage capacity within South Harrison Township.	Municipal OEM and Fire Department	Moderate	Public Property Mitigation	< \$100K	Three to five years	Conduct project scoping.
M-9	Upgrade water tank storage capacity for use by the Harrisonville Fire Department (CF-4).	Municipal OEM and Fire Department	Moderate	Public Property Mitigation	< \$100K	Three to five years	Conduct project scoping.
M-10	Upgrade culverts along Porches Mill Road.	Municipal OEM and Public Works Department	Moderate	Private Property Flood Mitigation	< \$100K	Three to five years	Conduct project scoping.
M-11	Upgrade culverts at Marl Road.	Municipal OEM and Public Works Department	Moderate	Private Property Flood Mitigation	< \$100K	Three to five years	Conduct project scoping.
M-12	Harden / retrofit infrastructure and load path for Township Hall located on Harrisonville Road (CF-1).	Municipal OEM and Public Works Department	Moderate	Building Retrofit	\$100K - \$500K	Three to five years	Conduct project scoping.
M-13	Harden / retrofit infrastructure and load path for Harrisonville Fire Department building located on Harrisonville Road (CF-4).	Municipal OEM, Fire Department, and Public Works Department	Moderate	Building Retrofit	\$100K - \$500K	Three to five years	Conduct project scoping.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies) ⁷	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-14	Harden / retrofit infrastructure and load path for South Harrison Elementary School located on Harrisonville Road (CF-6).	Municipal OEM, Public Works Department, and School Board	Moderate	Building Retrofit	\$100K - \$500K	Three to five years	Conduct project scoping.
M-15	Upgrade South Harrison Elementary School security system, specifically camera capabilities to better protect students and employees (CF-6).	Municipal OEM and School Board	Moderate	Risk / Threat Assessment	< \$50K	One to five years	Conduct project scoping.

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.17-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.17-4.

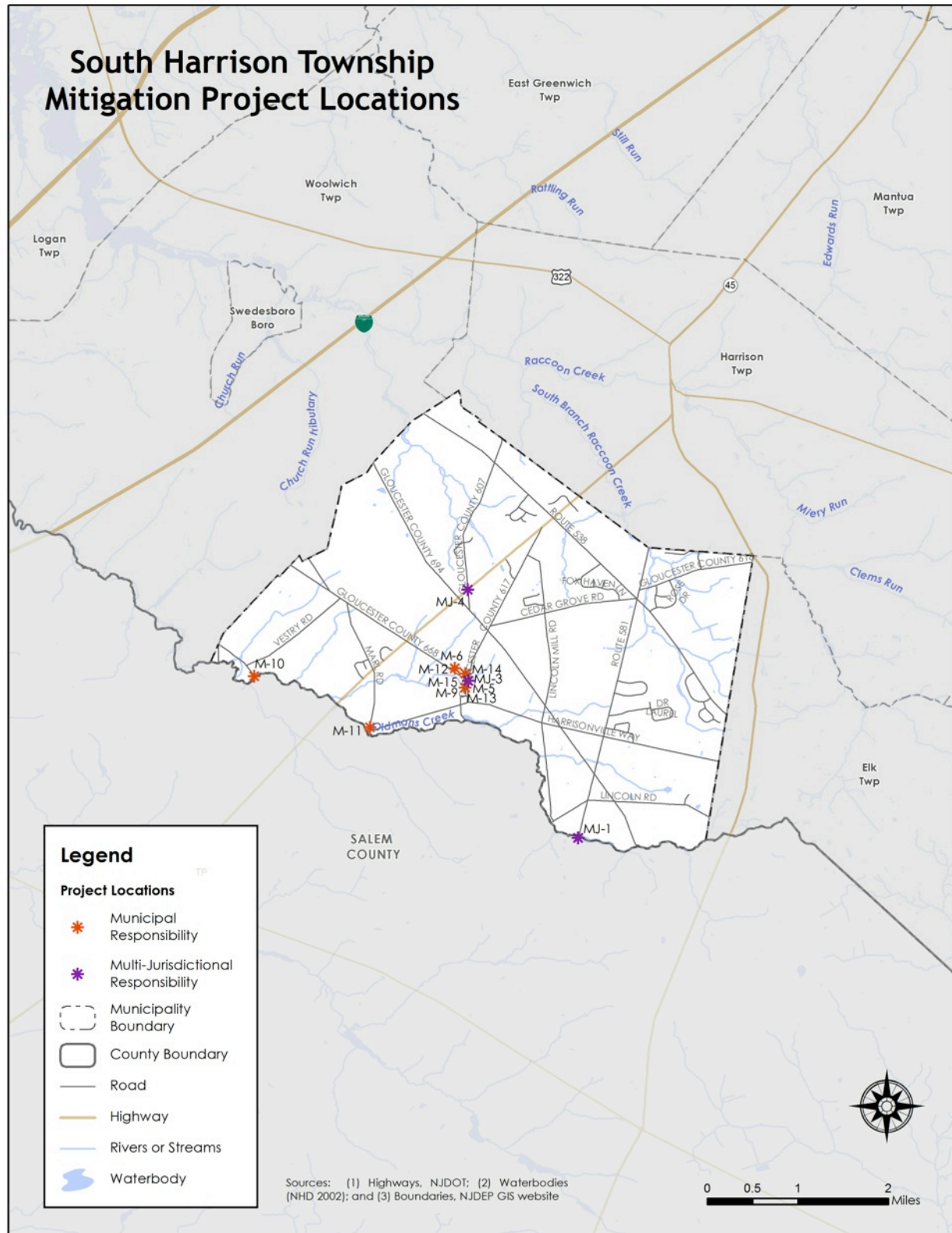
Part 4: Mitigation Measures

Table GC.17-13: South Harrison Township (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Risk Assessment of Algonkin Lake (Lincoln Lake) to South Harrison Township.	Dam Failure	Goal #4	Both	Municipal OEM, Gloucester County DPW, Salem County DPW, Upper Pittsgrove TWP DPW	Low
MJ-2	Wind risk to communications tower (repeater tower).	High Wind	Goal #4	Both	Municipal OEM, Communications Tower Private Owner	High
MJ-3	Alleviate flooding at County Route 617 (Mullica Hill Road), and County Route 668 (Harrisonville Road).	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-4	Alleviate flooding at intersection of State Route 45 and County Route 607 (Tomlin-Station Road).	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-5	Wind risk to communications tower (repeater tower).	High Wind	Goal #4	Both	Municipal OEM, Private Owners	High

Part 4: Mitigation Measures

Figure GC.17-4: South Harrison Township Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan (2013)
- Flood Damage Protection Ordinance⁸
- Master Plan (2008)⁹
- Environmental Resource Inventory (2008)¹⁰
- Open Space and Recreation Plan (2009)¹¹
- Protecting Our Streams¹²
- Stormwater Management Facilities Maintenance Manual (1989)¹³
- Township Map

⁸ <http://ecode360.com/9989764#9989764>

⁹ http://southharrison-nj.org/Master_Plan.shtml

¹⁰ http://southharrison-nj.org/MasterPlan/South_Harrison_ERI-opt-1.pdf

¹¹ http://southharrison-nj.org/MasterPlan/South_Harrison_OSRP.pdf

¹² http://southharrison-nj.org/images/Protecting_Our_Streams.pdf

¹³ http://southharrison-nj.org/images/Stormwater_Management_Facilities.pdf

Attachment A: Public Review Comments

The following comments were received during the public review of the South Harrison Township Municipal Appendix:

Table GC.17.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the South Harrison Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.18
Swedesboro Borough, New Jersey

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.18-i
Part 1 Overview	GC.18-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.18-1
1.2: Swedesboro Borough (Gloucester County) Municipal Appendix	GC.18-1
Part 2 Participation	GC.18-2
2.1: Municipal Working Group Participation	GC.18-2
2.2: Public Participation	GC.18-4
Part 3 Hazard Identification and Risk Assessment	GC.18-5
3.1: Municipal Profile	GC.18-5
3.2: Hazard Priorities	GC.18-9
3.3: Hazard Mapping	GC.18-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.18-11
Part 4 Mitigation Measures	GC.18-15
4.1: Mitigation Goals and Strategy	GC.18-15
4.2: SDVR HMP Mitigation Measures	GC.18-16
4.3: Municipal Mitigation Measures – Identification	GC.18-17
4.4: Municipal Mitigation Measures – Implementation	GC.18-18
4.5: Multi-Jurisdictional Mitigation Measures	GC.18-19
4.6: Plan Review and Integration	GC.18-21

Table of Contents

List of Figures

Figure GC.18-1: Swedesboro Borough (Gloucester County) Location Map	GC.18-5
Figure GC.18-2: Swedesboro Borough Base Map	GC.18-6
Figure GC.18-3: Swedesboro Borough Housing Units by Year Built	GC.18-8
Figure GC.18-4: Swedesboro Borough Mitigation Project Locations	GC.18-20

List of Tables

Table GC.18-1: Swedesboro Borough (Gloucester County) Working Group	GC.18-2
Table GC.18-2: Public Participation	GC.18-4
Table GC.18-3: Swedesboro Borough Demographics	GC.18-7
Table GC.18-4: Swedesboro Borough Demographic Rankings	GC.18-7
Table GC.18-5: Swedesboro Borough Economics and Housing	GC.18-7
Table GC.18-6: Swedesboro Borough Ranking (Economics and Housing)	GC.18-8
Table GC.18-7: Supporting Mapping and Exhibits	GC.18-10
Table GC.18-8: Swedesboro Borough Critical Facilities Inventory	GC.18-12
Table GC.18-9: Swedesboro Borough Critical Facilities Hazard Exposure	GC.18-14
Table GC.18-10: Status of Swedesboro Borough SDVR HMP Mitigation Measures	GC.18-16
Table GC.18-11: Swedesboro Borough Municipal Mitigation Measures Identification	GC.18-17
Table GC.18-12: Swedesboro Borough Municipal Mitigation Measures Implementation	GC.18-18
Table GC.18-13: Swedesboro Borough Multi-Jurisdictional Mitigation Measures	GC.18-19

Attachments

Attachment GC.18.A: Public Review Comments	GC.18.A-1
Attachment GC.18.B: Adoption Resolution	GC.18.B-1
Attachment GC.18.C: Approval Letter	GC.18.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Swedesboro Borough (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Swedesboro Borough in Gloucester County, New Jersey.

The Swedesboro Borough Municipal Working Group recommended the Swedesboro Borough (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Swedesboro Borough Council adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.18-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.18-1: Swedesboro Borough (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Other	Contribution ³
Eric	Voight	Swedesboro Borough Office of Emergency Management / Woolwich Township Office of Emergency Management	Emergency Management Coordinator / Deputy Emergency Management Coordinator		<input checked="" type="checkbox"/>		Organized Working Group and Work Sessions.
Richard	Jaramillo	Woolwich Township Police Department / Swedesboro Borough Office of Emergency Management	Emergency Management Coordinator / Deputy Emergency Management Coordinator	<input checked="" type="checkbox"/>			Organized Working Group and Work Sessions.
Tanya	Goodwin	Swedesboro Borough Administrative Offices	Borough Clerk		<input checked="" type="checkbox"/>		
Robert	Schmid	Swedesboro Borough Zoning Office	Zoning Officer / Floodplain Administrator			<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on July 30, 2014.

² Round 2 Work Session was held on October 9, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.18-1.

Part 2: Participation

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Elected Officials
- Land Use / Economic Development Planner
- Building Code Official
- Engineering
- Public Works
- Police
- Fire
- Business Associations
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Emergency Medical Services
- Community / Faith-Based Organizations
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Major Employers and Businesses
- Healthcare Institutions

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.18-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.18-2: Public Participation

Date	Type of Involvement	Location
September 30, 2014	Link to Project Website (http://nj4hmp.com) established	Historic Swedesboro New Jersey ⁵
November 17, 2014	Information item included on Swedesboro Borough Council agenda identifying opportunities for public participation	Swedesboro Borough Hall
November 20, 2014	Flyers posted	Public Bulletin Board, Entrances of Borough Hall, Post Office, and Comcast Building
November 22, 2014	Citizen Survey posted	Historic Swedesboro New Jersey, Mitigation Plan for Four New Jersey Counties ⁶
December 1, 2014	Information item included on Swedesboro Borough Council agenda identifying opportunities for public participation	Swedesboro Borough Hall
December 8, 2014	Preliminary Municipal Appendix posted to website for public comment	Historic Swedesboro New Jersey, Mitigation Plan for Four New Jersey Counties
December 15, 2014	Public hearing included on Swedesboro Borough Council agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Swedesboro Borough Hall
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁷ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁸

⁵ <http://www.historicswedesboro.com/government/borough-hall/>

⁶ <http://www.historicswedesboro.com/2014/12/hazard-mitigation-plan/>

⁷ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁸ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

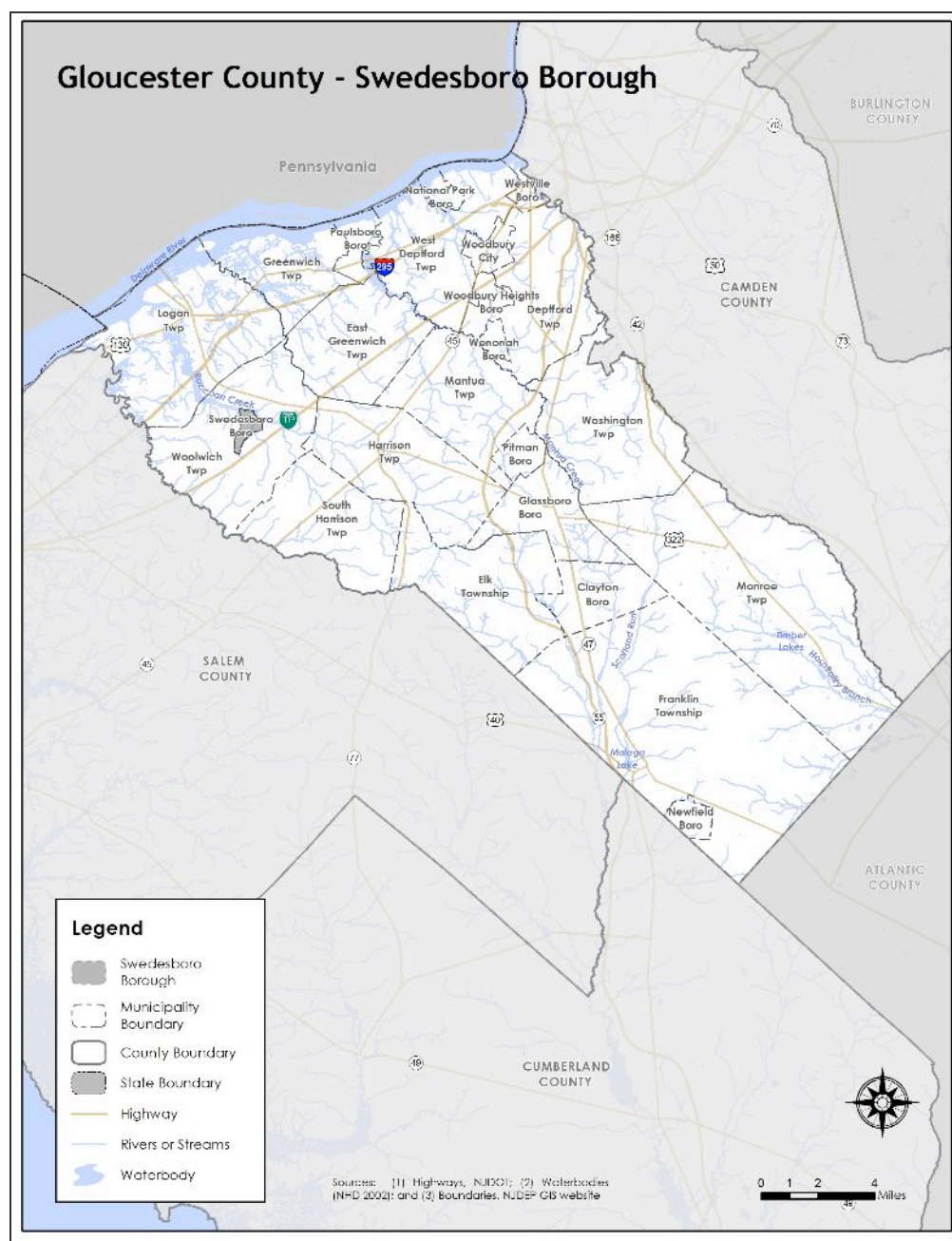
Part 3.1: Municipal Profile

Part 3.1 includes:

- Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation
- A brief character sketch for the municipality that is only intended to portray a few of the most basic elements

Swedesboro Borough is located in the northwestern part of Gloucester County (See Figure GC.18-1).

Figure GC.18-1: Swedesboro Borough (Gloucester County) Location Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.18-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.18-3: Swedesboro Borough Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Swedesboro Borough	Gloucester County	Region	New Jersey
2000 Population	2,055	254,673	974,328	8,414,350
2010 Population	2,584	288,288	1,024,926	8,791,894
Percent Change	25.74%	13.2%	5.19%	4.49%
Population Density	3,568.4 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	0.72 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	27.4	24.4	24.1	23.5
% of Population 18 - 64	62.6	63.2	62.7	63
% of Population 65 and over	10.0	12.4	13.2	13.5

Table GC.18-4 illustrates how Swedesboro Borough ranks in the county, the four county region, and New Jersey.

Table GC.18-4: Swedesboro Borough Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	22	71	466
Land Area Rank	24	82	518
Population Density Rank	4	28	180
Population Change Rank	5	5	-

Table GC.18-5 includes information related to economic and housing statistics for Swedesboro Borough, Gloucester County, the four county region, and New Jersey.

Table GC.18-5: Swedesboro Borough Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Swedesboro Borough	Gloucester County	Region	New Jersey
Date Incorporated	April 9, 1902	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$65,085	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	1,004	109,796	397,990	3,529,033
Occupied Housing Units	938	104,271	372,472	3,176,069
Vacant Housing Units	66	5,525	25,518	352,964
Owner Occupied Housing Units	611	83,525	266,593	2,126,279

Part 3: Hazard Identification and Risk Assessment

	Swedesboro Borough	Gloucester County	Region	New Jersey
Renter Occupied Housing Units	327	20,746	105,879	1,049,790
Building Permits	52	716	1,554	13,535
Largest Industry	Educational Services	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

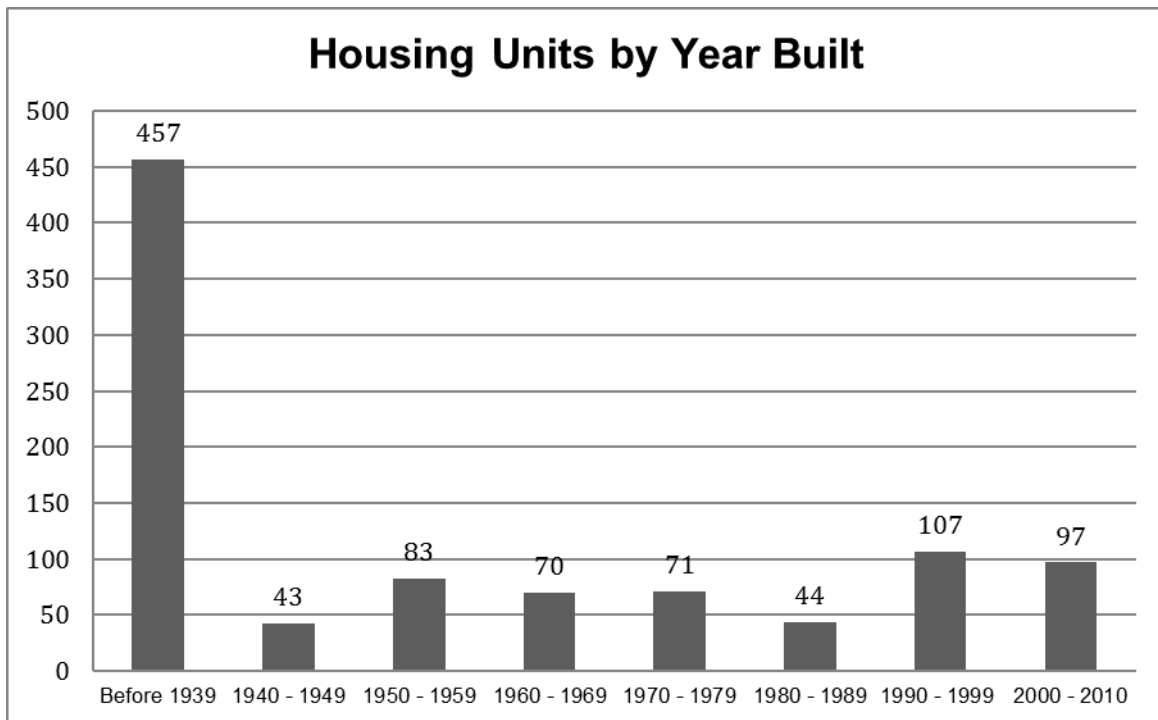
Table GC.18-6 illustrates how Swedesboro Borough ranks in the county and the four county region.

Table GC.18-6: Swedesboro Borough Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	17	41
Vacant Housing Rank	19	67
Renter Occupied Housing Rank	15	53
Building Permits	5	9

Figure GC.18-3 illustrates development patterns in Swedesboro Borough by examining housing units by year built. About 45% of homes in Swedesboro Borough were built prior to 1939.

Figure GC.18-3: Swedesboro Borough Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- None

Moderate Priority

- Dam Failure
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Low Priority

- Earthquake
- Extreme Temperature: Cold & Hot
- Flood

Five additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Drought
- Geologic Hazards
- Levee Failure
- Wildfire

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3: Hazard Identification and Risk Assessment

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.18-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.18-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge)	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where inundation due to storm surge may occur

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.18-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.18-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.18-8: Swedesboro Borough (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Borough Hall	Municipal	Administrative Office	1517 Kings Highway, Swedesboro	CF-2	N	N		
CF-2	Emergency Operations Center	EOC	Co-located Facilities	1517 Kings Highway, Swedesboro	CF-1	N	N	Alternate EOC	
CF-3	Emergency Operations Center	EOC	Co-located Facilities ²	120 Village Green Drive, Woolwich		Y	Y		
CF-4	Swedesboro Fire Services	FireStation	Stations	1517 Kings Highway / P.O. Box 9, Swedesboro		N	N		
CF-5	Public Works	Public Works	Combined Administrative Office, Maintenance / work Area, Equipment / Material Storage, and Fueling Station	131 Chestnut Street, Swedesboro		N	N		
CF-6	Water Treatment Plant	Utilities – Water	Treatment Plants	130-140 Chestnut Street, Swedesboro		N/A	N		
CF-7	Water Tower	Utilities – Water	Water Towers	130-140 Chestnut Street, Swedesboro		N/A	N		
CF-8	Sewer Plant	Utilities – Wastewater	Treatment Plants	1101 Kings Highway, Swedesboro		N/A	N		
CF-9	Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	431 Broad Street, Swedesboro		N/A	N		M-4
CF-10	Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	45 Franklin Street, Swedesboro		N/A			
CF-11	Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	Horner Street, Swedesboro		N/A			
CF-12	Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	Turner and West, Swedesboro		N/A			

² Swedesboro Borough EOC is located at the Woolwich Township Municipal Building in Woolwich Township.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-13	Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	Merkling Street, Swedesboro		N/A			
CF-14	Walter Hill Elementary School	Schools	Public Schools	1815 Kings Highway / P.O. Box 9, Swedesboro		N	N		
CF-15	Margaret C. Clifford Elementary School	Schools	Public Schools	601 Auburn Avenue, Swedesboro		N	N		

Part 3: Hazard Identification and Risk Assessment

Table GC.18-9: Swedesboro Borough (Gloucester County) Critical Facilities Hazard Exposure³

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Borough Hall	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-3	Emergency Operations Center	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-4	Swedesboro Fire Services	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-5	Public Works	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-6	Water Treatment Plant	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-7	Water Tower	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-8	Sewer Plant	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-9	Pump Station	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-10	Pump Station	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-11	Pump Station	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-12	Pump Station	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-13	Pump Station	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-14	Walter Hill Elementary School	N/A	N/A	N/A		N/A							N/A	N/A	N/A
CF-15	Margaret C. Clifford Elementary School	N/A	N/A	N/A		N/A							N/A	N/A	N/A

³ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.18-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.18-10.

Table GC.18-10: Status of Swedesboro Borough (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Swedesboro 1: Engineering study to assess risk for Narraticon Lake Dam.	Completed	Issue was resolved through Swedesboro Borough capital improvement funds. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Swedesboro 2: Engineering study to determine appropriate action related to envelope hardening and improved load path for police station/ Borough Hall located on Kings Highway.	Completed	Issue was resolved through Swedesboro Borough capital improvement funds. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Swedesboro 3: Engineering study to determine appropriate action related to envelope hardening and improved load path for Fire/EMS (Swedesboro fire department) located at Kings Highway and Auburn Road.	Completed	Issue was resolved through Woolwich Township capital improvement funds. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A

Table GC.18-10 Notes:

- A. See Tables GC.18-11 and GC.18-12 for municipal (M-#) mitigation measures
- B. See Table GC.18-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.18-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Note: Swedesboro Borough does not currently have RL or SRL properties per information provided by the New Jersey Department of Environmental Protection.

Table GC.18-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.18-4.

Table GC.18-11: Swedesboro Borough (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.²	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-4	Install permanent backup emergency power generator at pump station (CF-9). ³	All	Goal #4	Both

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

³ Project included in Letter of Interest (LOI) for DR 4086 HMGP. LOI project #1215 budget = \$60,000.00.

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.18-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria⁴
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁵
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.18-12: Swedesboro Borough (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Low	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Low	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Low	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.
M-4	Install permanent backup emergency power generator at pump station (CF-9).	Municipal OEM	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁵ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.18-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.18-4.

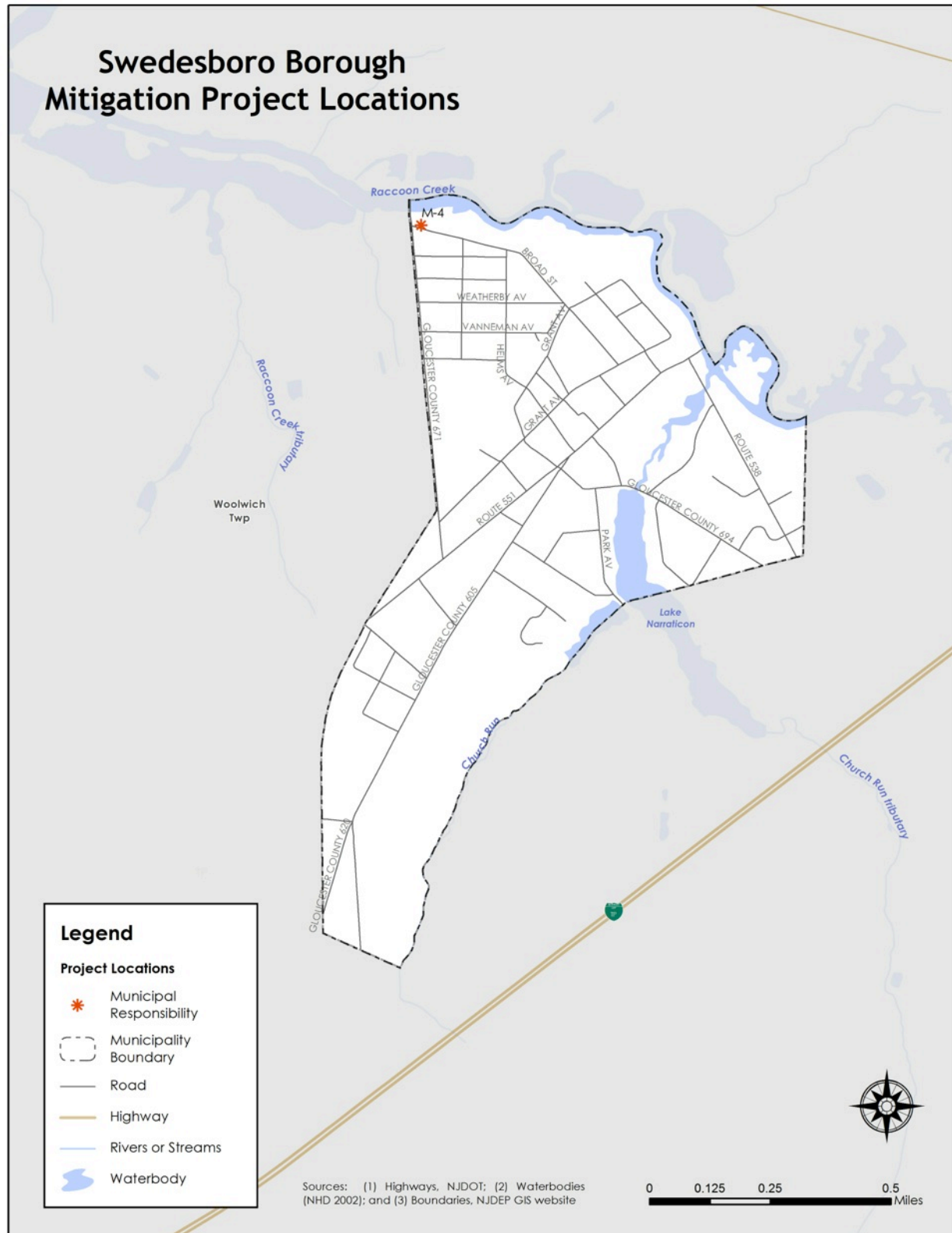
Table GC.18-13: Swedesboro Borough (Gloucester County) Multi-Jurisdictional Mitigation Measures⁶

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1						

⁶ **Note to Draft NJ4 HMP Reviewers:** No multi-jurisdictional mitigation measures were identified during the Work Sessions with the municipality. If no multi-jurisdictional mitigation measure are identified before the Municipal Appendix is ready for adoption, Part 4.5 and Table GC.18-13 will be revised to note the situation but identify that multi-jurisdictional mitigation measures may be identified by the municipality as part of future updates.

Part 4: Mitigation Measures

Figure GC.18-4: Swedesboro Borough Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Floodplain Management Ordinance⁷
- Master Plan and Reexamination Report (2008)
- Redevelopment Areas Map (2009)⁸
- Zoning Map (2009)⁹
- Zoning Map Existing Land Uses¹⁰
- Zoning Plan¹¹
- Capital Improvement Budget (2014)¹²

⁷ <http://www.ecode360.com/15313573#15313573>

⁸ <http://www.historicswedeseboro.com/wp-content/uploads/2012/07/Redevelopment-Areas-Map.pdf>

⁹ <http://www.historicswedeseboro.com/wp-content/uploads/2012/07/Zoning-Map.pdf>

¹⁰ <http://www.historicswedeseboro.com/wp-content/uploads/2012/07/Existing-Use-Map.pdf>

¹¹ <http://www.ecode360.com/15310592#15310592>

¹² <http://www.ecode360.com/documents/SW0669/public/111639562.pdf>

Attachment A: Public Review Comments

The following comments were received during the public review of the Swedesboro Borough Municipal Appendix:

Table GC.18.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Swedesboro Borough Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.19
Washington Township, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.19-i
Part 1 Overview	GC.19-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.19-1
1.2: Washington Township (Gloucester County) Municipal Appendix	GC.19-1
Part 2 Participation	GC.19-2
2.1: Municipal Working Group Participation	GC.19-2
2.2: Public Participation	GC.19-4
Part 3 Hazard Identification and Risk Assessment	GC.19-5
3.1: Municipal Profile	GC.19-5
3.2: Hazard Priorities	GC.19-9
3.3: Hazard Mapping	GC.19-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.19-11
Part 4 Mitigation Measures	GC.19-23
4.1: Mitigation Goals and Strategy	GC.19-23
4.2: SDVR HMP Mitigation Measures	GC.19-24
4.3: Municipal Mitigation Measures – Identification	GC.19-25
4.4: Municipal Mitigation Measures – Implementation	GC.19-27
4.5: Multi-Jurisdictional Mitigation Measures	GC.19-29
4.6: Plan Review and Integration	GC.19-31

Table of Contents

List of Figures

Figure GC.19-1: Washington Township (Gloucester County) Location Map	GC.19-5
Figure GC.19-2: Washington Township Base Map	GC.19-6
Figure GC.19-3: Washington Township Housing Units by Year Built	GC.19-8
Figure GC.19-4: Washington Township Mitigation Project Locations	GC.19-30

List of Tables

Table GC.19-1: Washington Township (Gloucester County) Working Group	GC.19-2
Table GC.19-2: Public Participation	GC.19-4
Table GC.19-3: Washington Township Demographics	GC.19-7
Table GC.19-4: Washington Township Demographic Rankings	GC.19-7
Table GC.19-5: Washington Township Economics and Housing	GC.19-7
Table GC.19-6: Washington Township Ranking (Economics and Housing)	GC.19-8
Table GC.19-7: Supporting Mapping and Exhibits	GC.19-10
Table GC.19-8: Washington Township Critical Facilities Inventory	GC.19-12
Table GC.19-9: Washington Township Critical Facilities Hazard Exposure	GC.19-18
Table GC.19-10: Status of Washington Township SDVR HMP Mitigation Measures	GC.19-24
Table GC.19-11: Washington Township Municipal Mitigation Measures Identification	GC.19-25
Table GC.19-12: Washington Township Municipal Mitigation Measures Implementation	GC.19-27
Table GC.19-13: Washington Township Multi-Jurisdictional Mitigation Measures	GC.19-29

Attachments

Attachment GC.19.A: Public Review Comments	GC.19.A-1
Attachment GC.19.B: Adoption Resolution	GC.19.B-1
Attachment GC.19.C: Approval Letter	GC.19.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Washington Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Washington Township in Gloucester County, New Jersey.

The Washington Township Municipal Working Group recommended the Washington Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Washington Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.19-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.19-1: Washington Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Working Group Meeting ³	Contribution ⁴
Robert	Borkowski	Washington Township Police Department / Washington Township Office of Emergency Management (OEM)	Police Captain / Deputy OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Frank	Campbell	Washington Township OEM	OEM Coordinator			<input checked="" type="checkbox"/>	
Vincent	Lamonica Jr.	Washington Township Police Department / Washington Township OEM	Police Sergeant / Deputy OEM Coordinator	<input checked="" type="checkbox"/>			
William	Grutzmacher	Washington Township Public School District Board of Education	Director of Safety and Security			<input checked="" type="checkbox"/>	
Nicholas	Pileggi	Washington Township Municipal Services	Director - Municipal Services	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on September 30, 2014.

² Round 2 Work Session was held on November 6, 2014.

³ Municipal Working Group and Township Committee Meeting was held on December 18, 2014.

⁴ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.19-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Working Group Meeting ³	Contribution ⁴
Sheri	Donovan	Washington Township Planning & Zoning Office	Zoning Officer		<input checked="" type="checkbox"/>		
John	DiStefano	Washington Township Planning & Zoning Office	Construction Code Official / Floodplain Administrator	<input checked="" type="checkbox"/>			
Annina	Hogan	Washington Township Engineering	Director of Engineering		<input checked="" type="checkbox"/>		
Rafael	Muniz	Washington Township Police Department	Chief of Police		<input checked="" type="checkbox"/>		
Everett John	Hoffman	Washington Township Fire Department	Fire Chief		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Patrick	Dolgos	Washington Township Fire Department	Captain	<input checked="" type="checkbox"/>			
Leon	Lakritz	Washington Township Environmental Commission	Chair	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Taft	Barnett	Disaster Cycle Services, American Red Cross	Disaster Program Specialist	<input checked="" type="checkbox"/>			
Patricia	Madden	Administration, Kennedy Health Systems	Clinical Director Emergency Navigation & Observation	<input checked="" type="checkbox"/>			

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁵

- Elected Officials
- Emergency Medical Services
- Business Associations
- Community / Faith-Based Organizations
- Critical Infrastructure and Key Resources

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Environmental Organizations
- Non-Governmental Organizations

⁵ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process

Table GC.9-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.19-2: Public Participation

Date	Type of Involvement	Location
September 15, 2014	Link to Project Website (http://nj4hmp.com) established	Washington Township, Gloucester County, N.J. ⁶
November, 2014	Public outreach	Advertised project on Comcast Channel 9 and Verizon Channel 36
November 25, 2014	Preliminary Municipal Appendix posted to website for public comment	Washington Township News ⁷
December 10, 2014	Public hearing included on Washington Township Committee agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Washington Township Municipal Building
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁸ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁹

⁶ <http://www.twp.washington.nj.us/#>

⁷ <http://twp.washington.nj.us/controls/eventview.aspx?MODE=SINGLE&ID=983>

⁸ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁹ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

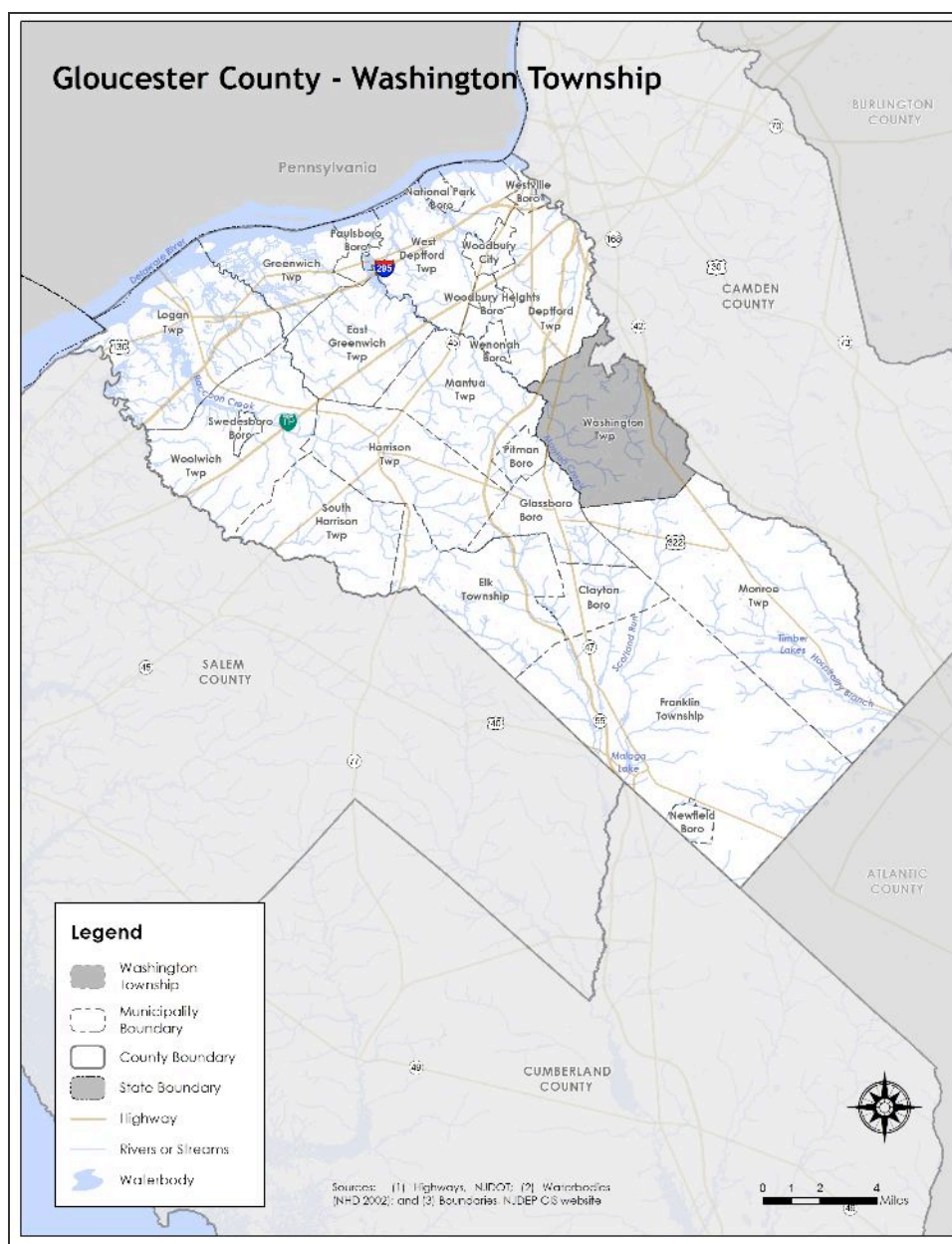
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Washington Township is located in the east-central edge of Gloucester County (See Figure GC.19-1).

Figure GC.19-1: Washington Township (Gloucester County) Location Map

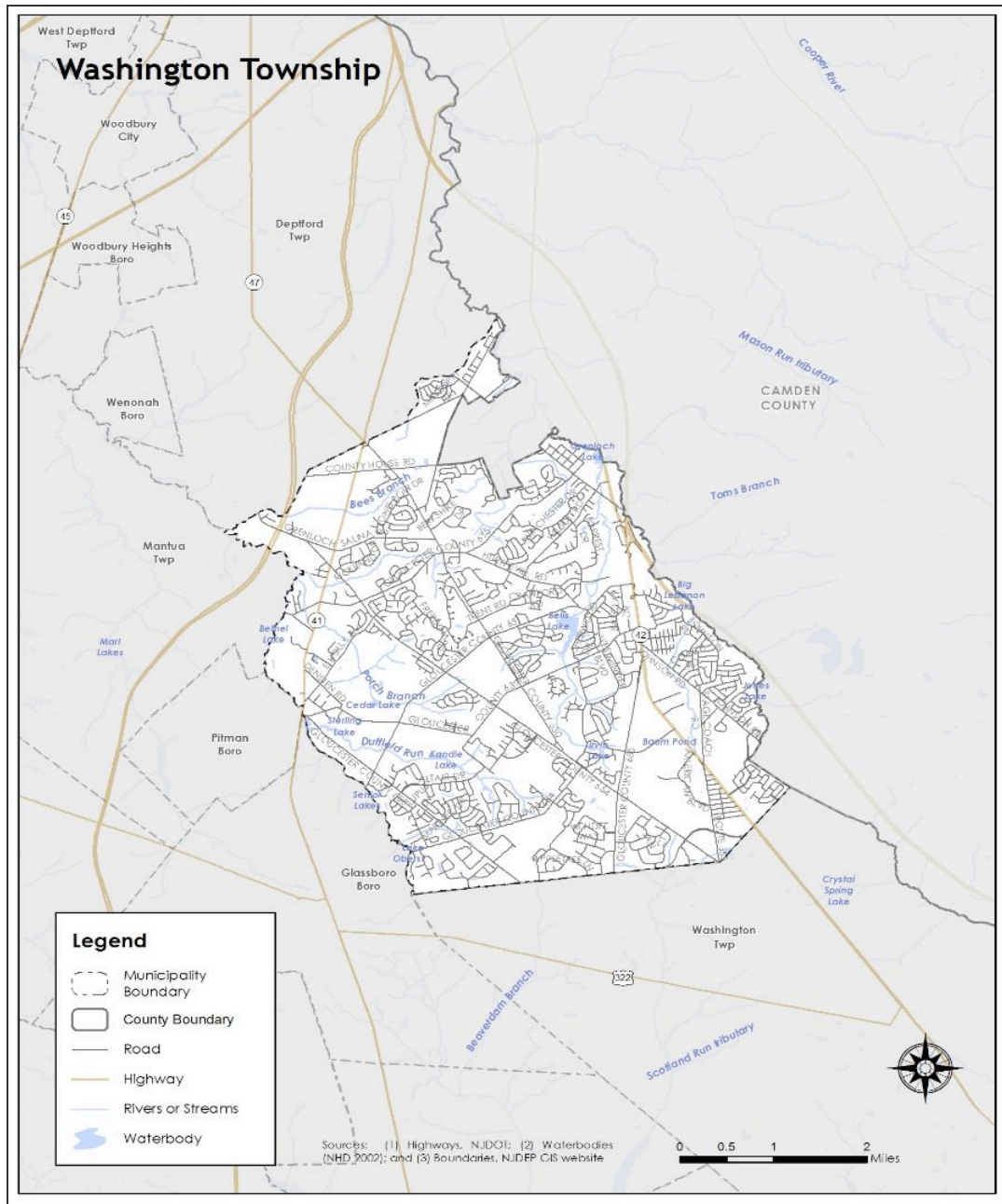


Part 3: Hazard Identification and Risk Assessment

Washington Township is the oldest community in the Grenloch Terrace area. Once a thriving Leni-Lenape Indian Village, Washington Township is now a family community with thriving retail, professional, and corporate businesses. Unincorporated communities in the municipality include Cross Keys and Hurffville.

Per Figure GC.19-2, the major water courses and water bodies include Porch Branch, Bethel Run, Duffield Run, Bell Lake, Grenlock Lake, Big Timber Creek, Blackwood Lake, Spring Lake, and Bethel Lake. Major transportation routes include State Highways include routes 47, 42, 168, Atlantic City Expressway, and various county routes. The land is predominantly flat.

Figure GC.19-2: Washington Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.19-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.19-3: Washington Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Washington Township	Gloucester County	Region	New Jersey
2000 Population	47,114	254,673	974,328	8,414,350
2010 Population	48,559	288,288	1,024,926	8,791,894
Percent Change	3.07%	13.2%	5.19%	4.49%
Population Density	2,271.0 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	21.38 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	24.0	24.4	24.1	23.5
% of Population 18 - 64	63.5	63.2	62.7	63
% of Population 65 and over	12.5	12.4	13.2	13.5

Table GC.19-4 illustrates how Washington Township ranks in the county, the four county region, and New Jersey.

Table GC.19-4: Washington Township Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 566)
Population Rank	1	5	37
Land Area Rank	4	24	125
Population Density Rank	9	39	268
Population Change Rank	13	34	-

Table GC.19-5 includes information related to economic and housing statistics for Washington Township, Gloucester County, the four county region, and New Jersey.

Table GC.19-5: Washington Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Washington Township	Gloucester County	Region	New Jersey
Date Incorporated	February 17, 1836	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$79,017	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	17,810	109,796	397,990	3,529,033
Occupied Housing Units	17,287	104,271	372,472	3,176,069
Vacant Housing Units	523	5,525	25,518	352,964
Owner Occupied Housing Units	14,470	83,525	266,593	2,126,279

Part 3: Hazard Identification and Risk Assessment

	Washington Township	Gloucester County	Region	New Jersey
Renter Occupied Housing Units	2,817	20,746	105,879	1,049,790
Building Permits	1	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

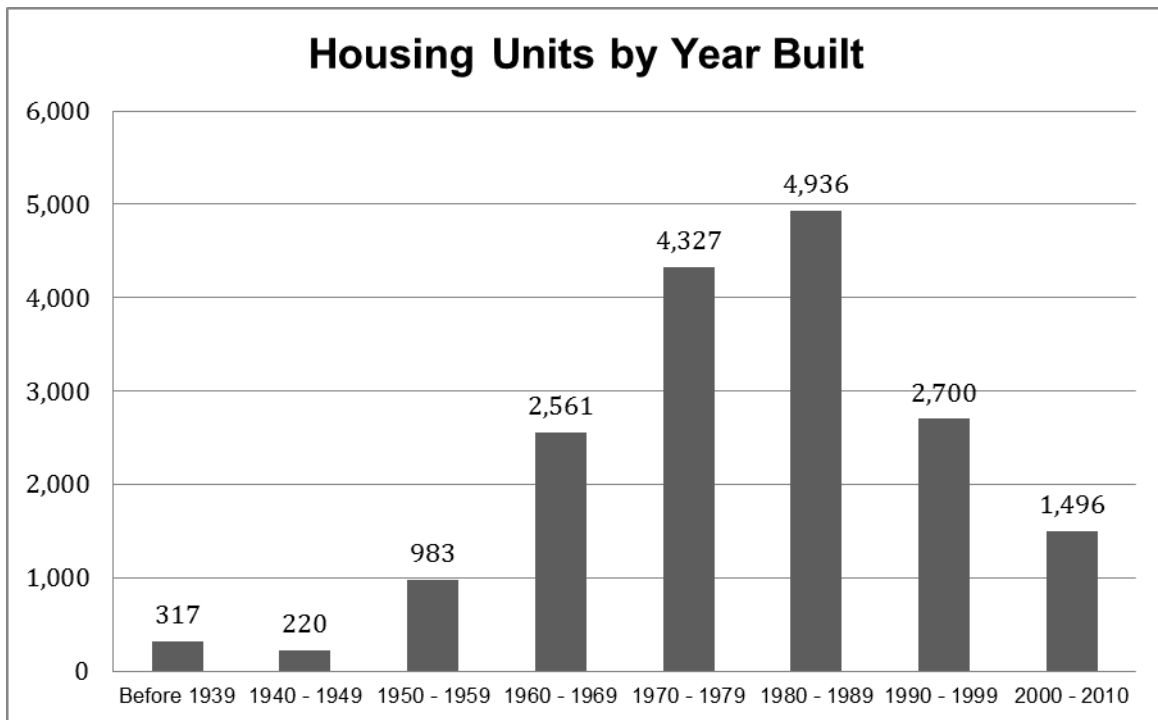
Table GC.19-6 illustrates how Washington Township ranks in the county and the four county region.

Table GC.19-6: Washington Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	9	17
Vacant Housing Rank	4	15
Renter Occupied Housing Rank	1	11
Building Permits	20	70

Figure GC.19-3 illustrates development patterns in Washington Township by examining housing units by year built. About 28% of homes in Washington Township were built during the 1980s.

Figure GC.19-3: Washington Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- None

Moderate Priority

- Dam Failure
- Flood
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Low Priority

- Drought
- Earthquake
- Extreme Temperature: Cold & Hot
- Wildfire

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Levee Failure

¹ See *Section 3: Hazard Identification and Risk Assessment*.

Part 3: Hazard Identification and Risk Assessment

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.19-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.19-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.19-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.19-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.19-8: Washington Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Township Hall	Municipal	Administrative Offices	523 Egg Harbor Road, Sewell		Y ²	N		
CF-2	Emergency Operations Center	EOC	Co-located Facility	213 East Holly Avenue, Sewell	CF-8, CF-9	N	Y		
CF-3	Police Station	Law Enforcement Facilities	Stations	1 McClure Drive, Sewell		N	Y	Includes a holding cell	M-8 / M-16
CF-4	Fire Station 10-3S	FireStation	Stations	321 Thies Road, Sewell		N	Y		
CF-5	Fire Station 10-2S	FireStation	Stations	327 Fries Mill Road, Sewell		N	Y		
CF-6	Fire Station 10-2M	FireStation	Stations	131 Johnson Road, Turnersville		Y ²	Y	Shelter for emergency services families	
CF-7	Fire Station 10-1M	FireStation	Stations	441 Hurffville Grenloch Road, Sewell		N	Y		
CF-8	Fire Station 10-3M	FireStation	Stations	213 East Holly Avenue, Sewell	CF-2, CF-10	N	Y ³	Headquarters	
CF-9	Fires Station 10-1S	FireStation	Stations	233 Greentree Road, Turnersville		N	Y		
CF-10	Fire Station 10-3M Maintenance Facility	FireStation	Equipment Storage	213 East Holly Avenue, Sewell	CF-2, CF-8	N	N	Separate building on site	M-5
CF-11	EMS	EMS	Municipal Stations	4 Willow Street, Turnersville		N	N		
CF-12	Public Works	Public Works	Administrative Offices	523 Egg Harbor Road, Sewell		N	N		
CF-13	Public Works Garage	Public Works	Maintenance / Work Areas	2 McClure Drive, Sewell		N	Y		M-6
CF-14	7-11 Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	8 Concord Court, Turnersville		N/A	N		
CF-15	Altair Drive	Utilities – Wastewater	Pump Stations / Lift Stations	137 Altair Drive, Sewell		N/A	Y		
CF-16	Fish Pond Road	Utilities – Wastewater	Pump Stations / Lift Stations	Fish Pond Road, Sewell		N/A	Y		

² Temporary / short-term shelter.

³ Back-up generator provides partial building coverage for emergency lighting.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-17	Hospital	Utilities – Wastewater	Pump Stations / Lift Stations	Kennedy Hospital, Sewel		N/A	Y		
CF-18	High School	Utilities – Wastewater	Pump Stations / Lift Stations	Hurffville Cross Keys Road, Sewell		N/A	Y		
CF-19	Heather Road	Utilities – Wastewater	Pump Stations / Lift Stations.	8 Heather Road, Turnersville		N/A	N		
CF-20	Westminster	Utilities – Wastewater	Pump Stations / Lift Stations	326 Westminster Boulevard, Turnersville		N/A	Y		
CF-21	Bells Lake	Utilities – Wastewater	Pump Stations / Lift Stations	810 Westminster Boulevard, Turnersville		N/A	N		
CF-22	Bridge Drive	Utilities – Wastewater	Pump Stations / Lift Stations	11 Colonial Way, Turnersville		N/A	Y		
CF-23	Foxwood	Utilities – Wastewater	Pump Stations / Lift Stations	796 Richmond Drive, Turnersville		N/A	Y		
CF-24	Valley Green	Utilities – Wastewater	Pump Stations / Lift Stations	Fairmont Boulevard, Turnersville		N/A	Y		
CF-25	Lake	Utilities – Wastewater	Pump Stations / Lift Stations	317 Whitman Drive, Turnersville		N/A	N		
CF-26	Cranford	Utilities – Wastewater	Pump Stations / Lift Stations	22 Cranford Road, Turnersville		N/A	N		
CF-27	Virginia	Utilities – Wastewater	Pump Stations / Lift Stations	10 Virginia Drive, Sewell		N/A	Y		
CF-28	Forrest	Utilities – Wastewater	Pump Stations / Lift Stations	254 Forrest Drive, Blackwood		N/A	Y		
CF-29	Foyt	Utilities – Wastewater	Pump Stations / Lift Stations	140 Foyt Court, Turnersville		N/A	Y		
CF-30	Salina	Utilities – Wastewater	Pump Stations / Lift Stations	219 Claiborne Way, Sewell		N/A	N		
CF-31	United Artist	Utilities – Wastewater	Pump Stations / Lift Stations	132 Tuckahoe Road, Turnersville		N/A	Y		
CF-32	Orchard View	Utilities – Wastewater	Pump Stations / Lift Stations	Fries Mill Road, Turnersville		N/A	Y		
CF-33	Twin Ponds	Utilities – Wastewater	Pump Stations / Lift Stations	Appletree & Stayman Lane, Sewell		N/A	N		
CF-34	Water's Edge	Utilities – Wastewater	Pump Stations / Lift Stations	611 Greentree Road, Sewell		N/A	N		
CF-35	Newtown Commons	Utilities – Wastewater	Pump Stations / Lift Stations	Devon Court, Sewell		N/A	N		

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-36	Heritage Woods	Utilities – Wastewater	Pump Stations / Lift Stations	16 Patriot Lane, Sewell		N/A	N		
CF-37	Bateman	Utilities – Wastewater	Pump Stations / Lift Stations	37 Winfield Circle, Blackwood		N/A	Y		
CF-38	Cross Keys	Utilities – Wastewater	Pump Stations / Lift Stations	Teresa Way, Sewell		N/A	Y		
CF-39	Wilson Road	Utilities – Wastewater	Pump Stations / Lift Stations	409 Wilson Road, Turnersville		N/A	Y		
CF-40	Surrey Lake	Utilities – Wastewater	Pump Stations / Lift Stations	County House Road, Sewell		N/A	Y		
CF-41	Nob Hill	Utilities – Wastewater	Pump Stations / Lift Stations	Good Intent & Lower Landing Road, Blackwood		N/A	Y		
CF-42	Delsea Drive	Utilities – Wastewater	Pump Stations / Lift Stations	245 Delsea Drive, Sewell		N/A	Y		
CF-43	Rickland	Utilities – Wastewater	Pump Stations / Lift Stations	737 Hurffville Cross Keys Road, Sewell		N/A	Y		
CF-44	Windsor	Utilities – Wastewater	Pump Stations / Lift Stations	33 Berkshire Drive, Sewell		N/A	N		
CF-45	Meadow Run	Utilities – Wastewater	Pump Stations / Lift Stations	Raymond & Egg Harbor Road, Sewell		N/A	Y		
CF-46	Woods at Fries Mill	Utilities – Wastewater	Pump Stations / Lift Stations	Melony Lane, Turnersville		N/A	N		
CF-47	Gardendale	Utilities – Wastewater	Pump Stations / Lift Stations	McKinley & Copper Avenue, Turnersville		N/A	Y		
CF-48	Heatherwood	Utilities – Wastewater	Pump Stations / Lift Stations	Caserta Drive, Sewell		N/A	Y		
CF-49	Whisper Ridge	Utilities – Wastewater	Pump Stations / Lift Stations	Mackenzie Court, Sewell		N/A	Y		
CF-50	Sawyers Creek	Utilities – Wastewater	Pump Stations / Lift Stations	Austin Road, Sewell		N/A	Y		
CF-51	Bells Elementary School	Schools	Public Schools	227 Greentree Road, Turnersville		N	Y ³		
CF-52	Birches Elementary School	Schools	Public Schools	416 Westminster Boulevard, Turnersville		N	Y ³		
CF-53	Grenloch Terrace Early Childhood Center	Schools	Public Schools	251 Woodbury-Turnersville Road, Sewell		N	N		

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-54	Hurffville Elementary School	Schools	Public Schools	200 Hurffville Grenloch Road, Sewell		N	Y ³		
CF-55	Thomas Jefferson Elementary School	Schools	Public Schools	95 Altair Drive, Turnersville		N	Y ³		
CF-56	Wedgwood Elementary School	Schools	Public Schools	236 Hurffville Road, Sewell		N	Y ³		
CF-57	Whitman Elementary School	Schools	Public Schools	827 Whitman School Drive, Turnersville		N	Y ³		
CF-58	Bunker Hill Middle School	Schools	Public Schools	372 Pitman Downer Road, Sewell		N	Y ³		
CF-59	Chestnut Ridge Middle School	Schools	Public Schools	641 Hurffville-Crosskeys Road, Sewell		Y	Y ³		
C-60	Orchard Valley Middle School	Schools	Public Schools	238 Pitman-Downer Road, Sewell		Y	Y ³		
CF-61	Washington Township High School	Schools	Public Schools	519 Hurffville-Crosskeys Road, Sewell		Y	Y ³		
CF-62	Little Achievers Learning Center	Schools	Private Schools	115 Johnson Road, Turnersville		N			
CF-63	Chesterbrook Academy	Schools	Private Schools	279 Egg Harbor Road, Sewell		N			
CF-64	The Goddard School of Washington	Schools	Private Schools	3 Plaza Drive, Sewell		N			
CF-65	Bethel Prep Christian Academy	Schools	Private Schools	359 Chapel Heights Road, Sewell		N			
CF-66	Beacon Academy, Inc.	Schools	Private Schools	570 Egg Harbor Road, Sewell		N			
CF-67	ABC Express Preschool, Inc.	Schools	Private Schools	697 Delsea Drive, Pitman		N			
CF-68	Bright Beginning Academy	Schools	Private Schools	315 Fries Mill Road, Turnersville		N			
CF-69	ABC Academy Pre-School	Schools	Private Schools	901 Route 168 Suite 402, Turnersville		N			

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-70	HollyDELL School	Schools	Private Schools	610 Holly Dell Drive, Sewell		N			
CF-71	KidAcademy Learning Center	Schools	Private Schools	444 Hurffville CrossKeys Road, Sewell		N			
CF-72	Sewell KinderCare	Schools	Private Schools	113 Egg Harbor Road, Sewell		N			
CF-73	KinderCare, Washington Township	Schools	Private Schools	456 Hurffville Crosskeys Road, Sewell		N			
CF-74	Little Leaders Academy	Schools	Private Schools	470 Delsea Drive, Sewell		N			
CF-75	The Malvern School of Washington Township	Schools	Private Schools	329 Greentree Road, Sewell		N			
CF-76	St. John's Christian Nursery	Schools	Private Schools	149 Ganttown Road, Turnersville		N			
CF-77	Tutor Time	Schools	Private Schools	123 Egg Harbor Road, Sewell		N			
CF-78	T L C Day Care Center, Inc.	Vulnerable Populations Facilities	Private Child Day Care	356 Greentree Road, Sewell		N			
CF-79	A Place to Grow	Vulnerable Populations Facilities	Private Child Day Care	151 Fries Mill Road Suite 501, Turnersville		N			
CF-80	Senior Center	Vulnerable Populations Facilities	Senior Centers	315 Greentree Road, Sewell		Y	N		M-7
CF-81	Washington Township Senior Living	Vulnerable Populations Facilities	Private Assisted Living	600 Medical Center Drive, Sewell		N ⁴			
CF-82	Terraces at Park Place	Vulnerable Populations Facilities	Private Assisted Living	661 Delsea Drive, Sewell		N ⁴			
CF-83	The Gardens at Cross Keys	Vulnerable Populations Facilities	Private Assisted Living	3152 Glassboro Cross Keys Road, Glassboro		N ⁴			

⁴ Shelter-in place.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-84	Washington Township Cardinal Village Senior Living Community	Vulnerable Populations Facilities	Private Assisted Living	455 Hurffville Crosskeys Road, Sewell		N ⁴			
CF-85	Kennedy University Hospital, Washington Township	Health Care Facilities	Private Hospitals	435 Hurffville Crosskeys Road, Turnersville		N ⁴			
CF-86	Kennedy Cancer Center	Health Care Facilities	Private Health Clinic / Treatment Centers	900 Medical Center Drive, Sewell		N ⁴			
CF-87	Kennedy Dialysis Center at Washington Township	Health Care Facilities	Private Health Clinic / Treatment Centers	300 Medical Center Drive, Sewell		N ⁴			
CF-88	Kennedy Health Care Center – Long-Term Care and Rehabilitation Facility	Health Care Facilities	Private Rehabilitation Centers	535 Egg Harbor Road, Sewell		N ⁴			
CF-89	ManorCare Health Services at Washington Township	Health Care Facilities	Private Rehabilitation Centers	378 Fries Mill Road, Sewell		N ⁴			

Part 3: Hazard Identification and Risk Assessment

Table GC.19-9: Washington Township (Gloucester County) Critical Facilities Hazard Exposure⁵

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Township Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-3	Police Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-4	Fire Station 103S	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-5	Fire Station 102S	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-6	Fire Station 102M	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-7	Fire Station 101M	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-8	Fire Station 103M	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-9	Fires Station 101S	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-10	Fire Station 103M Maintenance Facility	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-11	EMS	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-12	Public Works	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-13	Public Works Garage	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-14	7-11 Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-15	Altair Drive	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-16	Fish Pond Road	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-17	Hospital	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-18	High School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-19	Heather Road	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-20	Westminster	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-21	Bells Lake	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-22	Bridge Drive	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-23	Foxwood	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-24	Valley Green	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-25	Lake	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-26	Cranford	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

⁵ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-27	Virginia	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-28	Forrest	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-29	Foyt	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-30	Salina	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-31	United Artist	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-32	Orchard View	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-33	Twin Ponds	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-34	Water's Edge	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-35	Newtown Commons	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-36	Heritage Woods	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-37	Bateman	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-38	Cross Keys	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-39	Wilson Road	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-40	Surrey Lake	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-41	Nob Hill	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-42	Delsea Drive	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-43	Rickland	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-44	Windsor	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-45	Meadow Run	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-46	Woods at Fries Mill	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-47	Gardendale	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-48	Heatherwood	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-49	Whisper Ridge	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-50	Sawyers Creek	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-51	Bells Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-52	Birches Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-53	Grenloch Terrace Early Childhood Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-54	Hurffville Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-55	Thomas Jefferson Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-56	Wedgwood Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-57	Whitman Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-58	Bunker Hill Middle School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-59	Chestnut Ridge Middle School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-60	Orchard Valley Middle School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-61	Washington Township High School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-62	Little Achievers Learning Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-63	Chesterbrook Academy	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-64	The Goddard School of Washington	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-65	Bethel Prep Christian Academy	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-66	Beacon Academy, Inc.	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-67	ABC Express Preschool, Inc.	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-68	Bright Beginning Academy	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-69	ABC Academy Pre-School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-70	HollyDELL School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-71	KidAcademy Learning Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-72	Sewell KinderCare	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-73	KinderCare, Washington Township	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
C-74	Little Leaders Academy	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-75	The Malvern School of Washington Township	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-76	St. John's Christian Nursery	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-77	Tutor Time	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-78	T L C Day Care Center, Inc.	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-79	A Place to Grow	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-80	Senior Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-81	Washington Township Senior Living	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-82	Terraces at Park Place	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-83	The Gardens at Cross Keys	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-84	Washington Township Cardinal Village Senior Living Community	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-85	Kennedy University Hospital, Washington Township	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-86	Kennedy Cancer Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-87	Kennedy Dialysis Center at Washington Township	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-88	Kennedy Health Care Center – Long-Term Care and Rehabilitation Facility	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-89	ManorCare Health Services at Washington Township	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures, in particular relating to repetitive flood loss properties and private dam monitoring and maintenance
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.19-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the "Comments" column and the far right-hand column of Table GC.19-10.

Table GC.19-10: Status of Washington Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Washington 1: Engineering evaluation of drainage on Palomar.	Not completed, not funded.	Revised mitigation measure included in updated Municipal Appendix.	M-10
Washington 2: Improve Spring Lake Road culvert.	Work-in progress.	Project is being funded through Washington Township capital improvement funds and is currently in progress. Therefore revised mitigation measure is included in the updated Municipal Appendix. ¹	M-14
Washington 3: Engineering evaluation to assess dam on Spring Lake.	Work-in progress.	Project is being funded through Washington Township capital improvement funds and is currently in progress. Therefore revised mitigation measure is included in the updated Municipal Appendix. ²	M-9
Washington 4: Stream bank stabilization of Avonbrook Drive.	Completed.	Project was funded through Washington Township capital improvement funds. ³	N/A
Washington 5: Stream bank stabilization of Hyannis Drive.	Not completed, not funded.	Revised mitigation measure is included in the updated Municipal Appendix.	M-11

Table GC.19-10 Notes:

- A. See Tables GC.19-11 and GC.19-12 for municipal (M-#) mitigation measures
- B. See Table GC.19-13 for multi-jurisdictional (MJ-#) mitigation measures

¹ Work on this mitigation measure is scheduled to commence in second quarter 2015 and is scheduled for completion by fourth quarter 2015.

² Work on this mitigation measure is scheduled to commence in third quarter 2015 and is scheduled for completion by fourth quarter 2015.

³ Work on this mitigation measure began the week of September 24, 2014 was completed on by October 17, 2014.

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.19-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)⁴ if applicable

Table GC.19-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.19-4.

Table GC.19-11: Washington Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners using a variety of methods to include the Fire Safety Public safety Trailer regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level to include dam monitoring and maintenance.⁵	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Flood	Goal #2	Existing

⁴ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

⁵ For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-5	Install permanent backup emergency power generator at Fire Station 10-3M Maintenance Facility on East Holly Avenue (CF-10).	All	Goal #4	Both
M-6	Install permanent backup emergency power generator at Public Works Facility (CF-13).	All	Goal #4	Both
M-7	Install permanent backup emergency power generator at Senior Center (CF-80).	All	Goal #4	Both
M-8	Upgrade permanent backup emergency power generator at Police Department (CF-3).	All	Goal #4	Both
M-9	Engineering evaluation to assess dam on Spring Lake.	Dam Failure	Goal #4	Existing
M-10	Engineering study to identify upgrades to storm water management system on Palomar Road.	Flood	Goal #4	Existing
M-11	Stabilize stream bank on Hyannis Drive.	Flood	Goal #4	Both
M-12	Dredge basin on Goodwin Parkway to restore water storage capacity.	Flood	Goal #4	Existing
M-13	Dredge Spring Lake to restore Lake's water storage capacity.	Flood	Goal #4	Existing
M-14	Improve culvert on Spring Lake Avenue.	Flood	Goal #4	Both
M-15	Address identified Repetitive Flood Loss Properties.	Flood	Goal #4	Both
M-16	Harden / retrofit Police Department building to include upgrade to roof (CF-3).	High Wind	Goal #4	Both

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.19-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria⁶
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁷
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.19-12: Washington Township (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM and Fire Department	Moderate	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Low	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	Low	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.

⁶ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁷ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Install permanent backup emergency power generator at Fire Station 10-3M Maintenance Facility on East Holly Avenue (CF-10).	Municipal OEM and Fire Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Install permanent backup emergency power generator at Public Works Facility (CF-12).	Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-7	Install permanent backup emergency power generator at Senior Center (CF-80).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-8	Upgrade permanent backup emergency power generator at Police Department (CF-3).	Municipal OEM and Police Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-9	Engineering evaluation to assess dam on Spring Lake.	Municipal OEM and Public Works Department	Low	Public Property Flood Mitigation	< \$50K	On-going	Develop scope of work for engineering study and procure professional consulting services.
M-10	Engineering study to identify upgrades to storm water management system on Palomar Road.	Municipal OEM and Public Works Department	High	Public Property Flood Mitigation	< \$150K	One to three years	Develop scope of work for engineering study and procure professional consulting services.
M-11	Stabilize stream bank on Hyannis Drive.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	< \$100K	On-going	Conduct project scoping.
M-12	Dredge basin on Goodwin Parkway to restore water storage capacity.	Municipal OEM and Public Works Department	Low	Public Property Flood Mitigation	< \$150K	Three to five years	Conduct project scoping.
M-13	Dredge Spring Lake to restore Lake's water storage capacity.	Floodplain Administrator	Moderate	Public Property Flood Mitigation	< \$150K	Three to five years	Conduct project scoping.
M-14	Improve culvert on Spring Lake Avenue.	Municipal OEM, Public Works Department, and Police Department	High	Public Property Flood Mitigation	< \$150K	On-going	Conduct project scoping.
M-15	Address identified Repetitive Flood Loss Properties.	Floodplain Administrator	Moderate	Private Property Flood Mitigation	\$100K - \$1M	One to two years	Identify mitigation options including eligible activities per FEMA HMPA programs.
M-16	Harden / retrofit Police Department building to include upgrade to roof (CF-3).	Municipal OEM, Public Works Department, and Police Department	High	Building Retrofit	< \$100K	Three to five years	Conduct project scoping.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

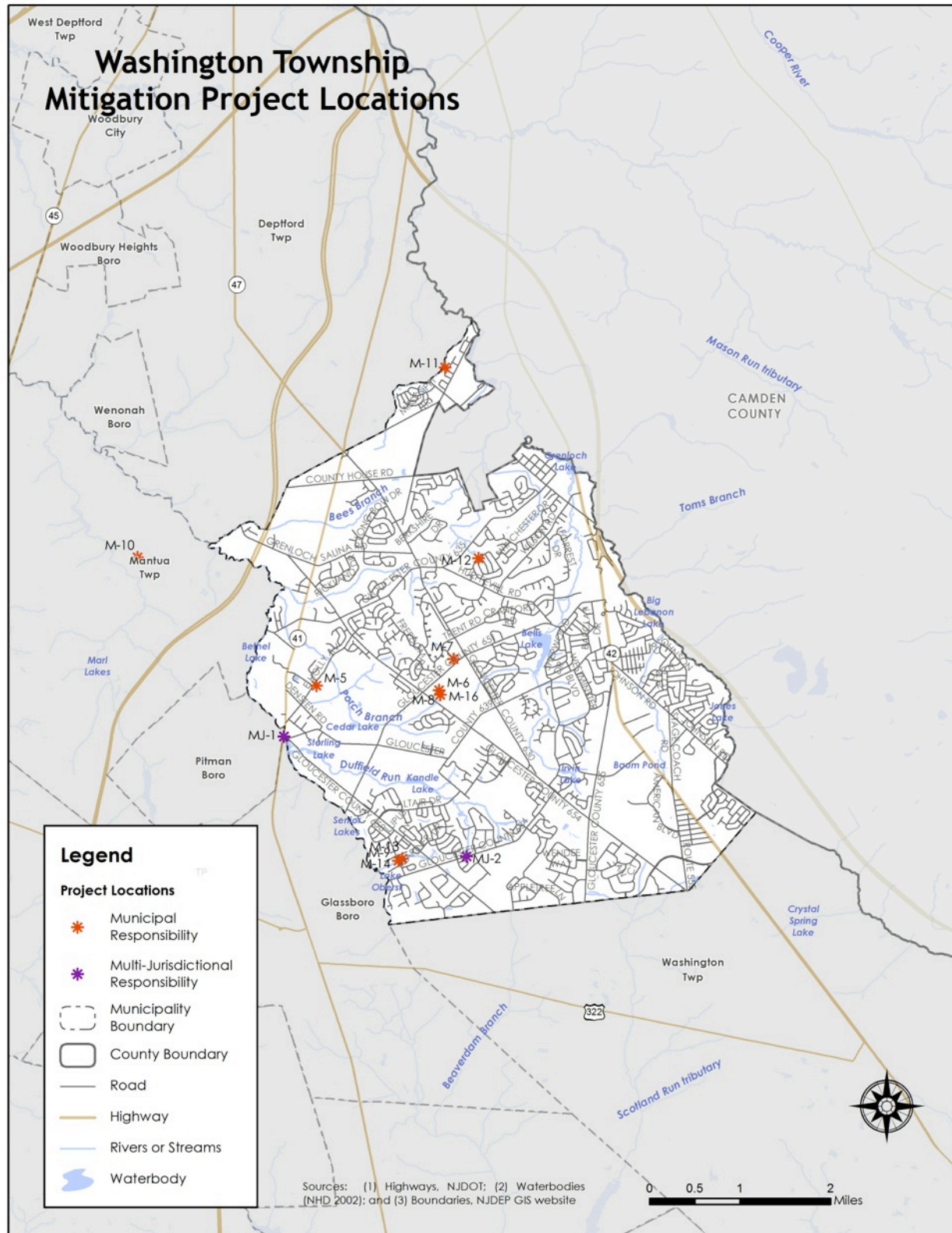
Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.19-4.

Table GC.19-13: Washington Township (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Alleviate flooding at County Route 658 (Pitman Downer Road) and New Jersey Route 47.	Flood	Goal #4	Both	Municipal OEM, Gloucester County OEM, Gloucester County DPW, NJDOT	Moderate
MJ-2	Alleviate flooding at County Route 634 (Fish Pond Road).	Flood	Goal #4	Both	Municipal OEM, Municipal DWP, Glassboro Borough DPW, Gloucester County OEM	Moderate

Part 4: Mitigation Measures

Figure GC.19-4: Washington Township Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan and Vulnerability Analysis (2012)
- Floodplain Management Ordinance⁸
- Master Plan (2004)
- Zoning Map⁹
- Development Regulations¹⁰
- Capital Improvement Budget (2014)¹¹

⁸ <http://ecode360.com/7666849#7666108>

⁹ http://twp.washington.nj.us/filestorage/698/774/0818-Zoning_Map.pdf

¹⁰ <http://ecode360.com/7666054#7665587>

¹¹ <http://twp.washington.nj.us/filestorage/73/524/budget.pdf>

Attachment A: Public Review Comments

The following comments were received during the public review of the Washington Township Municipal Appendix:

Table GC.19.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Washington Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.20
Wenonah Borough, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.20-i
Part 1 Overview	GC.20-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.20-1
1.2: Wenonah Borough (Gloucester County) Municipal Appendix	GC.20-1
Part 2 Participation	GC.20-2
2.1: Municipal Working Group Participation	GC.20-2
2.2: Public Participation	GC.20-4
Part 3 Hazard Identification and Risk Assessment	GC.20-5
3.1: Municipal Profile	GC.20-5
3.2: Hazard Priorities	GC.20-9
3.3: Hazard Mapping	GC.20-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.20-11
Part 4 Mitigation Measures	GC.20-16
4.1: Mitigation Goals and Strategy	GC.20-16
4.2: SDVR HMP Mitigation Measures	GC.20-17
4.3: Municipal Mitigation Measures – Identification	GC.20-18
4.4: Municipal Mitigation Measures – Implementation	GC.20-19
4.5: Multi-Jurisdictional Mitigation Measures	GC.20-21
4.6: Plan Review and Integration	GC.20-23

Table of Contents

List of Figures

Figure GC.20-1: Wenonah Borough (Gloucester County) Location Map	GC.20-5
Figure GC.20-2: Wenonah Borough Base Map	GC.20-6
Figure GC.20-3: Wenonah Borough Housing Units by Year Built	GC.20-8
Figure GC.20-4: Wenonah Borough Mitigation Project Locations	GC.20-22

List of Tables

Table GC.20-1: Wenonah Borough (Gloucester County) Working Group	GC.20-2
Table GC.20-2: Public Participation	GC.20-4
Table GC.20-3: Wenonah Borough Demographics	GC.20-7
Table GC.20-4: Wenonah Borough Demographic Rankings	GC.20-7
Table GC.20-5: Wenonah Borough Economics and Housing	GC.20-7
Table GC.20-6: Wenonah Borough Ranking (Economics and Housing)	GC.20-8
Table GC.20-7: Supporting Mapping and Exhibits	GC.20-10
Table GC.20-8: Wenonah Borough Critical Facilities Inventory	GC.20-12
Table GC.20-9: Wenonah Borough Critical Facilities Hazard Exposure	GC.20-14
Table GC.20-10: Status of Wenonah Borough SDVR HMP Mitigation Measures	GC.20-17
Table GC.20-11: Wenonah Borough Municipal Mitigation Measures Identification	GC.20-18
Table GC.20-12: Wenonah Borough Municipal Mitigation Measures Implementation	GC.20-20
Table GC.20-13: Wenonah Borough Multi-Jurisdictional Mitigation Measures	GC.20-21

Attachments

Attachment GC.20.A: Public Review Comments	GC.20.A-1
Attachment GC.20.B: Adoption Resolution	GC.20.B-1
Attachment GC.20.C: Approval Letter	GC.20.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Wenonah Borough (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Wenonah Borough in Gloucester County, New Jersey.

The Wenonah Borough Municipal Working Group recommended the Wenonah Borough (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Wenonah Borough Council adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.20-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.20-1: Wenonah Borough (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Working Group Meeting ³	Contribution ⁴
David	Shaver	Wenonah Borough of Wenonah OEM	OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Joseph	Buono	Wenonah Borough Fire Marshal	Deputy Emergency Management Coordinator / Fire Marshal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Thomas	Lombardo	Wenonah Borough Council	Mayor		<input checked="" type="checkbox"/>		
John R.	Dominy	Wenonah Borough Council	Council President		<input checked="" type="checkbox"/>		
Jack	Sheppard	Wenonah Borough Council	Councilman		<input checked="" type="checkbox"/>		
David	Kreck	Wenonah Borough Engineering	Borough Engineer / Floodplain Administrator / Wenonah Borough Environmental Commission Representative		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Provided municipal documents for review.

¹ Round 1 Work Session was held on July 31, 2014.

² Round 2 Work Session was held on October 30, 2014.

³ Municipal Working Group Meeting was held on December 18, 2014.

⁴ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.20-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Working Group Meeting ³	Contribution ⁴
Karen	Sweeney	Wenonah Borough Municipal Clerk / Admin	Municipal Offices		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Gary	Odenbrett	Wenonah Borough Shade Tree Commission	Chair			<input checked="" type="checkbox"/>	
Kenneth	Trovarelli	Wenonah Borough Public Works	Superintendent		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Seth	Basile	Wenonah Borough Police Department	Police Officer		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Drew	Sole	Wenonah Borough Fire Company	Fire Chief		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Richard	Black	Wenonah Borough Fire Department	Fire Captain		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Christopher	Black	Wenonah Borough Fire Department	Firefighter		<input checked="" type="checkbox"/>		
Trisha	Sheehan		Wenonah Borough Resident		<input checked="" type="checkbox"/>		

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁵

- Community / Faith-Based Organizations
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- Land Use / Economic Development Plan
- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Emergency Medical Services
- Business Associations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Major Employers and Businesses
- Healthcare Institutions

⁵ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.20-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.20-2: Public Participation

Date	Type of Involvement	Location
August 15, 2014	Link to Project Website (http://nj4hmp.com) established	Borough of Wenonah.com ⁶
November 25, 2014	Preliminary Municipal Appendix posted to website for public comment	Borough of Wenonah.com ⁶
December 18, 2014	Public hearing included on Wenonah Borough Committee agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Wenonah Borough Hall
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁷ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁸

⁶ <http://www.boroughofwenonah.com/index.php/2-uncategorised/175-mitigation-plan-for-four-nj-counties>

⁷ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁸ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

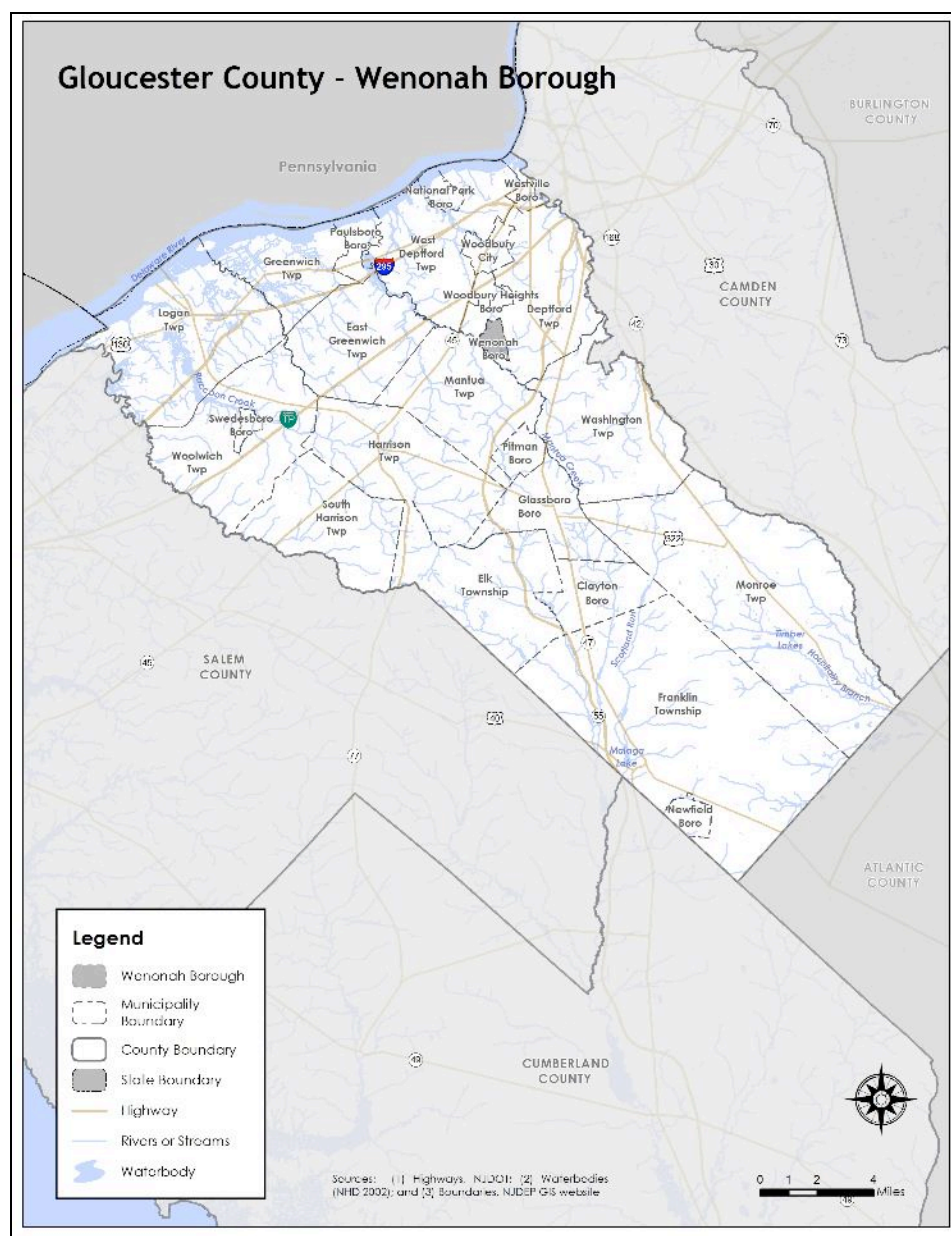
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Wenonah Borough is located in the northeastern part of Gloucester County (See Figure GC.20-1).

Figure GC.20-1: Wenonah Borough (Gloucester County) Location Map

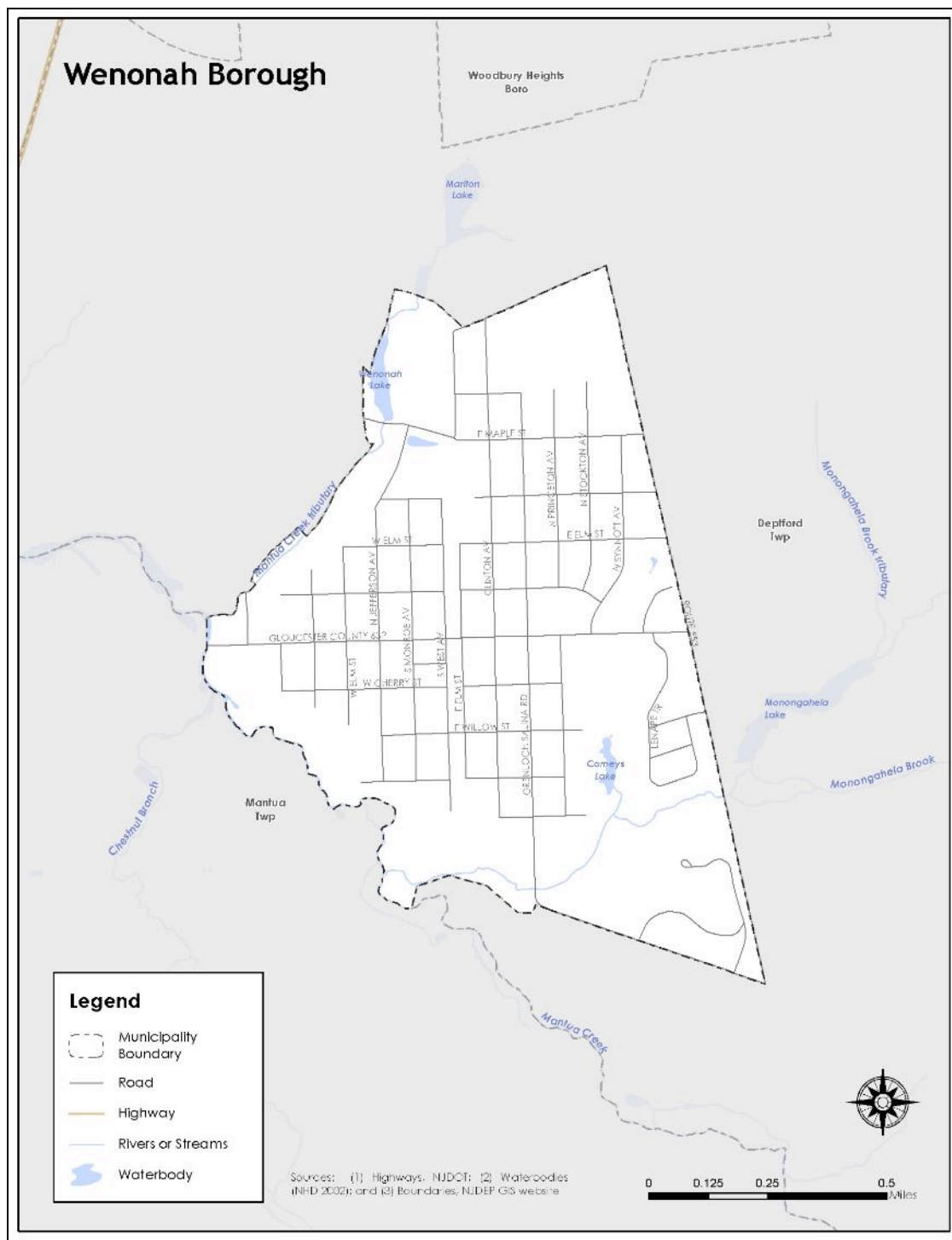


Part 3: Hazard Identification and Risk Assessment

Wenonah Borough is a historic rural town in Gloucester County.

Per Figure GC.20-2 the major water bodies include Wenonah Lake, Comey's Lake, Dilks Pond, Mantua Creek, and Monongahela Brook. The major transportation routes in Wenonah Borough are Gloucester County Routes 553 (Glassboro Road), and 632 (West Mantua Avenue). Locally, South Marion Avenue serves as a main route for evacuation. The land is predominantly flat.

Figure GC.20-2: Wenonah Borough Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.20-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.20-3: Wenonah Borough Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Wenonah Borough	Gloucester County	Region	New Jersey
2000 Population	2,317	254,673	974,328	8,414,350
2010 Population	2,278	288,288	1,024,926	8,791,894
Percent Change	-1.68%	13.2%	5.19%	4.49%
Population Density	2,342.8 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	0.97 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	25.1	24.4	24.1	23.5
% of Population 18 - 64	62.2	63.2	62.7	63
% of Population 65 and over	12.7	12.4	13.2	13.5

Table GC.20-4 illustrates how Wenonah Borough ranks in the county, the four county region, and New Jersey.

Table GC.20-4: Wenonah Borough Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	23	72	476
Land Area Rank	23	78	491
Population Density Rank	8	38	261
Population Change Rank	19	66	-

Table GC.20-5 includes information related to economic and housing statistics for Wenonah Borough, Gloucester County, the four county region, and New Jersey.

Table GC.20-5: Wenonah Borough Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Wenonah Borough	Gloucester County	Region	New Jersey
Date Incorporated	March 10, 1871	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$103,403	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	860	109,796	397,990	3,529,033
Occupied Housing Units	829	104,271	372,472	3,176,069
Vacant Housing Units	31	5,525	25,518	352,964
Owner Occupied Housing Units	749	83,525	266,593	2,126,279
Renter occupied Housing Units	80	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Wenonah Borough	Gloucester County	Region	New Jersey
Building Permits	2	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

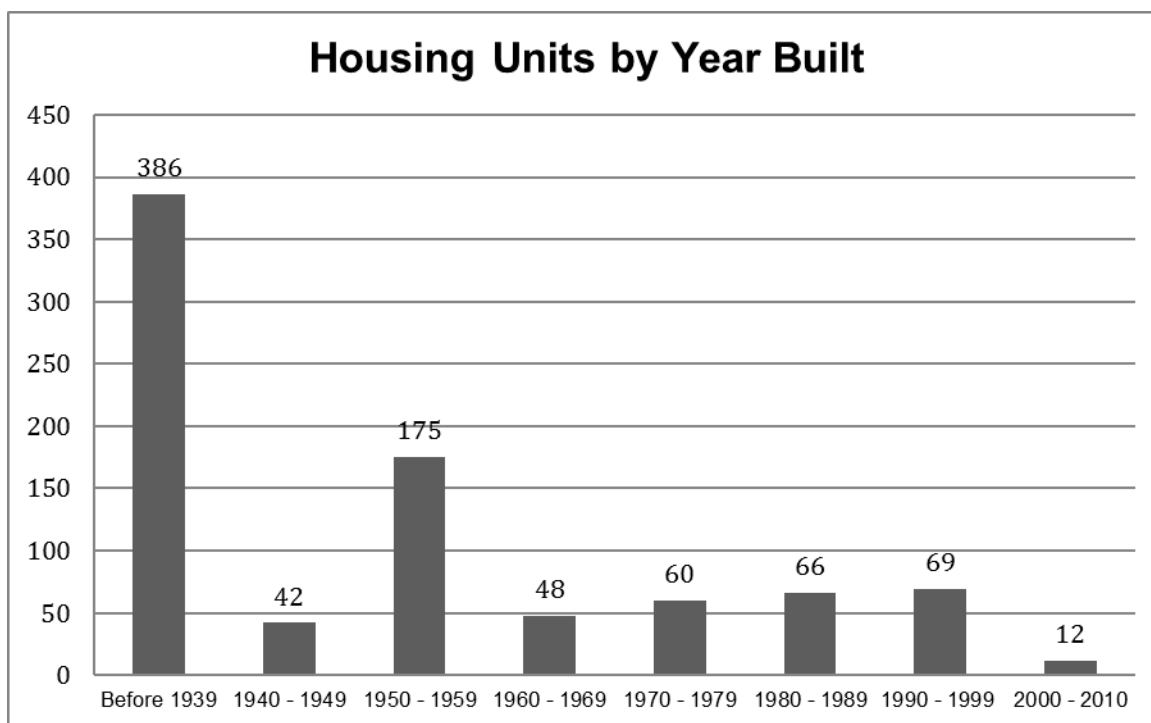
Table GC.20-6 illustrates how Wenonah Borough ranks in the county and the four county region.

Table GC.20-6: Wenonah Borough Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	3	5
Vacant Housing Rank	31	85
Renter Occupied Housing Rank	23	81
Building Permits Rank	17	61

Figure GC.20-3 illustrates development patterns in Wenonah Borough by examining housing units by year built. About 45% of homes in Wenonah Borough were built prior to 1939.

Figure GC.20-3: Wenonah Borough Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- None

Moderate Priority

- Dam Failure
- Flood
- High Wind

Low Priority

- Drought
- Earthquake
- Extreme Temperature: Cold & Hot
- Severe Weather – Summer
- Severe Weather – Winter
- Wildfire

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Levee Failure

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.20-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.20-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-3	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge)	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where inundation due to storm surge may occur
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.20-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.20-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.20-8: Wenonah Borough (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Borough Hall	Municipal	Administrative Offices	1 South West Avenue, Wenonah	CF-3	Y	Y		
CF-2	Emergency Operations Center	EOC	Co-located Facilities	14 South West Avenue, Wenonah	CF-4	N	Y		
CF-3	Police Station	Law Enforcement Facilities	Stations	1 South West Avenue, Wenonah	CF-1	N	Y	Includes a holding cell	
CF-4	Wenonah Fire Department	FireStation	Stations	14 South West Avenue, Wenonah	CF-2	N	Y		
CF-5	Public Works	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	1 West Maple Street, Wenonah		N	N	No fueling station exists at this location	
CF-6	Well #1	Utilities – Water	Wellheads	2 East Buttonwood Street, Wenonah	CF-8	N/A	Y ²		
CF-7	Well #2	Utilities – Water	Wellheads	2 West Maple Street, Wenonah		N/A	Y ²		
CF-8	Water Tower	Utilities – Water	Water Towers	2 East Buttonwood Street, Wenonah	CF-6	N/A	N		
CF-9	Elm Street Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	Elm Street, Wenonah		N/A	Y ²		
CF-10	Mantua Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	Mantua Avenue, Wenonah		N/A	Y		
CF-11	South Marion Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	South Marion Avenue, Wenonah		N/A	Y ²		
CF-12	Lenape Trail Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	Lenape Trail, Wenonah		N/A	Y ²		
CF-13	North Jefferson Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	North Jefferson Avenue, Wenonah		N/A	Y ²		
CF-14	Wenonah Elementary School	Schools	Public Schools	200 North Clinton Avenue, Wenonah		Y	N		M-5

² Portable back-up generator hook-up at pump station.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-15	All God's Children Preschool – Wenonah United Methodist Church	Vulnerable Populations Facilities	Private Child Day Care	105 East Willow Street, Wenonah		N	N		
CF-16	Willowglen Academy Group Home	Vulnerable Populations Facilities	Private / Non-Profit Group Homes	508 North Clinton Avenue, Wenonah		N	N		
CF-17	Memorial Presbyterian Church	Emergency Staging Areas	Equipment Mobilization	202 East Mantua Avenue, Wenonah		N	N		
CF-18	Holy Nativity Lutheran Church	Emergency Staging Areas	Equipment Mobilization	3 Lenape Trail, Wenonah		N	N		
CF-19	Holy Trinity Episcopal Church	Emergency Staging Areas	Equipment Mobilization	11 North Monroe Avenue, Wenonah		N	N		
CF-20	Community Center	Other Municipal	Community Center	2 North East Avenue, Wenonah		N	N		

Part 3: Hazard Identification and Risk Assessment

Table GC.20-9: Wenonah Borough (Gloucester County) Critical Facilities Hazard Exposure³

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Borough Hall	N/A	N/A	N/A		N/A							N/A		
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A							N/A		
CF-3	Police Station	N/A	N/A	N/A		N/A							N/A		
CF-4	Wenonah Fire Department	N/A	N/A	N/A		N/A							N/A		
CF-5	Public Works	N/A	N/A	N/A		N/A							N/A		
CF-6	Well #1	N/A	N/A	N/A		N/A							N/A		
CF-7	Well #2	N/A	N/A	N/A		N/A							N/A		
CF-8	Water Tower	N/A	N/A	N/A		N/A							N/A		
CF-9	Elm Street Pump Station	N/A	N/A	N/A		N/A							N/A		
CF-10	Mantua Avenue Pump Station	N/A	N/A	N/A		N/A							N/A		
CF-11	South Marion Pump Station	N/A	N/A	N/A		N/A							N/A		
CF-12	Lenape Trail Pump Station	N/A	N/A	N/A		N/A							N/A		
CF-13	North Jefferson Avenue Pump Station	N/A	N/A	N/A		N/A							N/A		
CF-14	Wenonah Elementary School	N/A	N/A	N/A		N/A							N/A		
CF-15	All God's Children Preschool – Wenonah United Methodist Church	N/A	N/A	N/A		N/A							N/A		
CF-16	Willowglen Academy Group Home	N/A	N/A	N/A		N/A							N/A		

³ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-17	Memorial Presbyterian Church	N/A	N/A	N/A		N/A							N/A		
CF-18	Holy Nativity Lutheran Church	N/A	N/A	N/A		N/A							N/A		
CF-19	Holy Trinity Episcopal Church	N/A	N/A	N/A		N/A							N/A		
CF-20	Community Center	N/A	N/A	N/A		N/A							N/A		

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.20-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.20-10.

Table GC.20-10: Status of Wenonah Borough (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Wenonah 1: Risk assessment study of electrical/utility infrastructure in borough.	Not completed, not funded	Issue is not considered valid. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Wenonah 2: Threat recognition of railroad tracks carrying chlorine, ethanol, etc. near municipal building, EOC, data storage facility, and firehouse.	Not completed, not funded	Revised mitigation measure is included in updated Municipal Appendix.	M-9

Table GC.20-10 Notes:

- A. See Tables GC.20-11 and GC.20-12 for municipal (M-#) mitigation measures
- B. See Table GC.20-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.20-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Note: Wenonah Borough does not currently have RL or SRL properties per information provided by the New Jersey Department of Environmental Protection.

Table GC.20-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.20-4.

Table GC.20-11: Wenonah Borough (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.²	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #2	Existing

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-5	Install permanent backup emergency power generator at Wenonah Elementary School (CF-14).	All	Goal #4	Both
M-6	Engineering study to (1) evaluate condition of existing storm sewer system and (2) identify areas subject to frequent erosion in order to update stormwater management plan accordingly.	Flood	Goal #4	Existing
M-7	Remedial measures to stabilize stream banks and stormwater drainage easements.	Flood	Goal #4	Both
M-8	Maintenance plan update and continuing implementation of tree debris clearing of conservation areas bordering public / private properties and from public rights of way.	High Wind	Goal #4	Both
M-9	Threat recognition of railroad tracks carrying hazardous materials near Wenonah Borough critical facilities. ³	Risk / Threat Assessment	Goal #4	Both

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.20-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria⁴
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁵
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

³ **Note to Draft NJ4 HMP Reviewers:** Although natural hazards are the focus of the NJ4 HMP, these technological hazards are a continuing concern to the community and are documented in the Municipal Appendix to reflect the full range of hazards within Wenonah Borough.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁵ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

Table GC.20-12: Wenonah Borough (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Low	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> Work with County Working Group to identify resource needs and availability. Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	High	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Low	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.
M-5	Install permanent backup emergency power generator at Wenonah Elementary School (CF-14).	Municipal OEM, Wenonah Elementary School, and Borough Council	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Engineering study to (1) evaluate condition of existing storm sewer system and (2) identify areas subject to frequent erosion in order to update stormwater management plan accordingly.	Municipal OEM, Borough Council, and Borough Engineer	High	Public Property Flood Mitigation	< \$100K	Three to five years	Develop scope of work for engineering study and procure professional consulting services.
M-7	Remedial measures to stabilize stream banks and stormwater drainage easements.	Municipal OEM, Borough Council, Borough Engineer, and Environmental Commission	High	Public Property Flood Mitigation	< \$100K	Three to five years	Conduct project scoping.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-8	Maintenance plan update and continuing implementation of tree debris clearing of conservation areas bordering public / private properties and from public rights of way.	Municipal OEM, Public Works Department, and Environmental Commission	Moderate	Private / Public Property Mitigation	< \$100K	One to three years	Conduct project scoping.
M-9	Threat recognition of railroad tracks carrying hazardous materials near Wenonah Borough critical facilities.	Municipal OEM	High	Risk / Threat Assessment	< \$50K	Three to five years	Develop scope of work for risk / threat assessment and procure professional consulting services.

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.20-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.20-4.

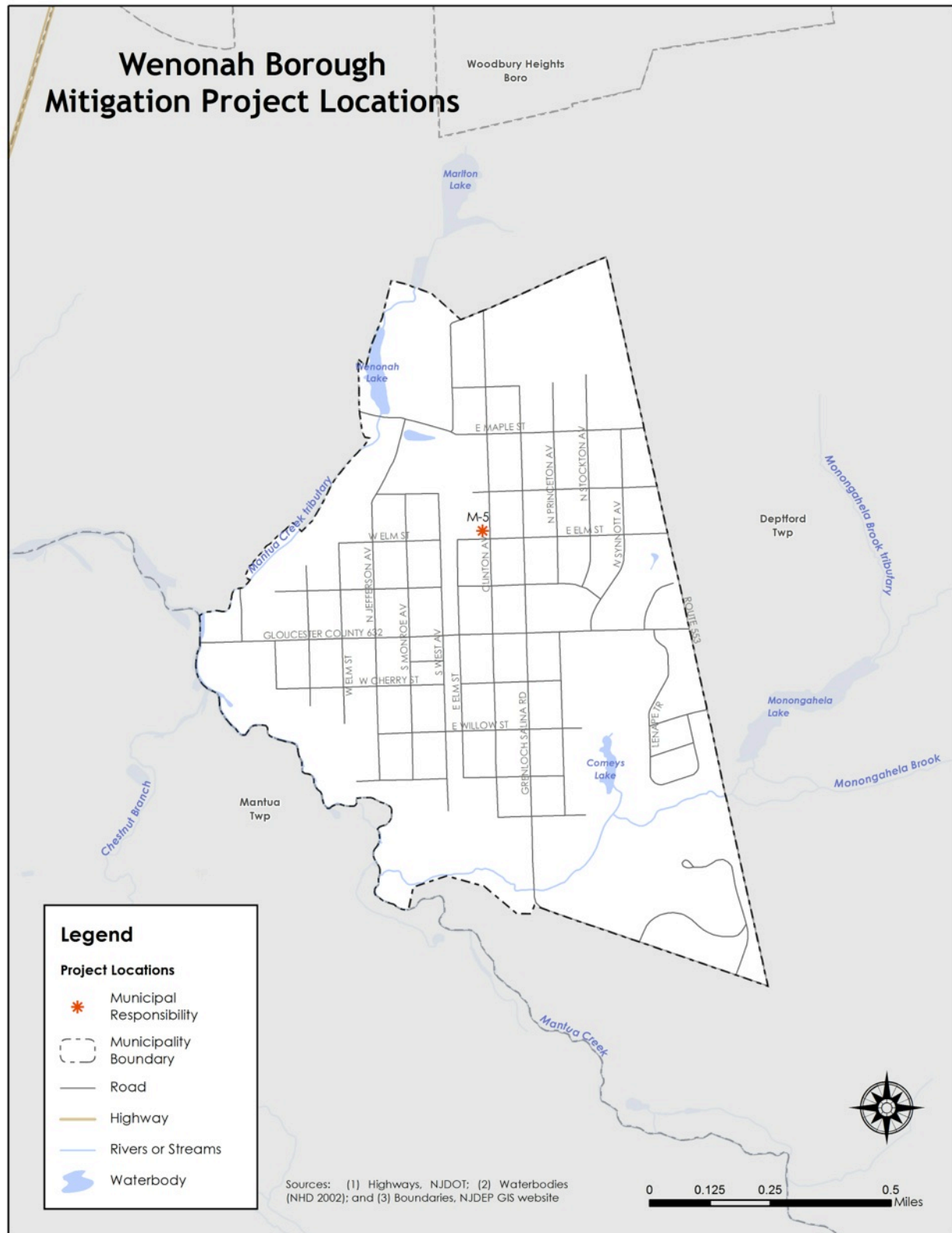
Table GC.20-13: Wenonah Borough (Gloucester County) Multi-Jurisdictional Mitigation Measures⁶

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1						

⁶ **Note to Draft NJ4 HMP Reviewers:** No multi-jurisdictional mitigation measures were identified during the Work Sessions with the municipality. If no multi-jurisdictional mitigation measure are identified before the Municipal Appendix is ready for adoption, Part 4.5 and Table GC.20-13 will be revised to note the situation but identify that multi-jurisdictional mitigation measures may be identified by the municipality as part of future updates.

Part 4: Mitigation Measures

Figure GC.20-4: Wenonah Borough Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan (2008)
- Land Use Ordinance (2003)
- Master Plan (1999)
- Master Plan Reexamination Report (2006)
- Stormwater Control Ordinance (2014)
- Stormwater Management Plan (2006)

Attachment A: Public Review Comments

The following comments were received during the public review of the Wenonah Borough Municipal Appendix:

Table GC.20.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of April 17, 2015, no public review comments were received for the Wenonah Borough Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.21
West Deptford Township, New Jersey

Draft

May 29, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.21-i
Part 1 Overview	GC.21-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.21-1
1.2: West Deptford Township (Gloucester County) Municipal Appendix	GC.21-1
Part 2 Participation	GC.21-2
2.1: Municipal Working Group Participation	GC.21-2
2.2: Public Participation	GC.21-4
Part 3 Hazard Identification and Risk Assessment	GC.21-5
3.1: Municipal Profile	GC.21-5
3.2: Hazard Priorities	GC.21-9
3.3: Hazard Mapping	GC.21-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.21-11
Part 4 Mitigation Measures	GC.21-19
4.1: Mitigation Goals and Strategy	GC.21-19
4.2: SDVR HMP Mitigation Measures	GC.21-20
4.3: Municipal Mitigation Measures – Identification	GC.21-21
4.4: Municipal Mitigation Measures – Implementation	GC.21-22
4.5: Plan Review and Integration	GC.21-25

Table of Contents

List of Figures

Figure GC.21-1: West Deptford Township (Gloucester County) Location Map	GC.21-5
Figure GC.21-2: West Deptford Township Base Map	GC.21-6
Figure GC.21-3: West Deptford Township Housing Units by Year Built	GC.21-8
Figure GC.21-4: West Deptford Township Mitigation Project Locations	GC.21-24

List of Tables

Table GC.21-1: West Deptford Township (Gloucester County) Working Group	GC.21-2
Table GC.21-2: Public Participation	GC.21-4
Table GC.21-3: West Deptford Township Demographics	GC.21-7
Table GC.21-4: West Deptford Township Demographic Rankings	GC.21-7
Table GC.21-5: West Deptford Township Economics and Housing	GC.21-7
Table GC.21-6: West Deptford Township Ranking (Economics and Housing)	GC.21-8
Table GC.21-7: Supporting Mapping and Exhibits	GC.21-10
Table GC.21-8: West Deptford Township Critical Facilities Inventory	GC.21-12
Table GC.21-9: West Deptford Township Critical Facilities Hazard Exposure	GC.21-16
Table GC.21-10: Status of West Deptford Township SDVR HMP Mitigation Measures	GC.21-20
Table GC.21-11: West Deptford Township Municipal Mitigation Measures Identification	GC.21-21
Table GC.21-12: West Deptford Township Municipal Mitigation Measures Implementation	GC.21-22

Attachments

Attachment GC.21.A: Public Review Comments	GC.21.A-1
Attachment GC.21.B: Adoption Resolution	GC.21.B-1
Attachment GC.21.C: Approval Letter	GC.21.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: West Deptford Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on West Deptford Township in Gloucester County, New Jersey.

The West Deptford Township Municipal Working Group recommended the West Deptford Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The West Deptford Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.9-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.21-1: West Deptford Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Joe	Gill	West Deptford Township OEM	Emergency Management Coordinator	<input checked="" type="checkbox"/>		Organized Working Group and Work Sessions.
Raymond	Chintall	West Deptford Township Administration	Mayor	<input checked="" type="checkbox"/>		
Brandon	Umba	West Deptford Township Administration	Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Provided municipal documents for review.
Sandi	Rost	West Deptford Township Zoning Office	Zoning Officer / Floodplain Administrator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Provided municipal documents for review.
Ronald	Snyder	Construction Office	Construction Official		<input checked="" type="checkbox"/>	
Joseph S.	Augustyn	Township Engineer	Township Planner / Land Use Board		<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on July 8, 2014.

² Round 2 Work Session was held on October 16, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.21-1.

Part 2: Participation

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Public Works
- Police
- Fire
- Community / Faith-Based Organizations
- Critical Infrastructure and Key Resources
- Major Employers and Businesses
- Healthcare Institutions
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Emergency Medical Services
- Business Associations
- Environmental Organizations
- Non-Governmental Organizations

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.21-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.21-2: Public Participation

Date	Type of Involvement	Location
July 15, 2014	Flyers posted	Municipal Building
August 15, 2014	Link to Project Website (http://nj4hmp.com) established	West Deptford ⁵
September 6, 2014	Flyers distributed	Distributed during West Deptford Day
December 17, 2014	Public notice regarding public hearing with West Deptford Township Committee	South Jersey Times
December 18, 2014	Public hearing included on West Deptford Township Committee agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	West Deptford Township Municipal Building
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁶ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁷

⁵ <http://www.westdeptford.com/>

⁶ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁷ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

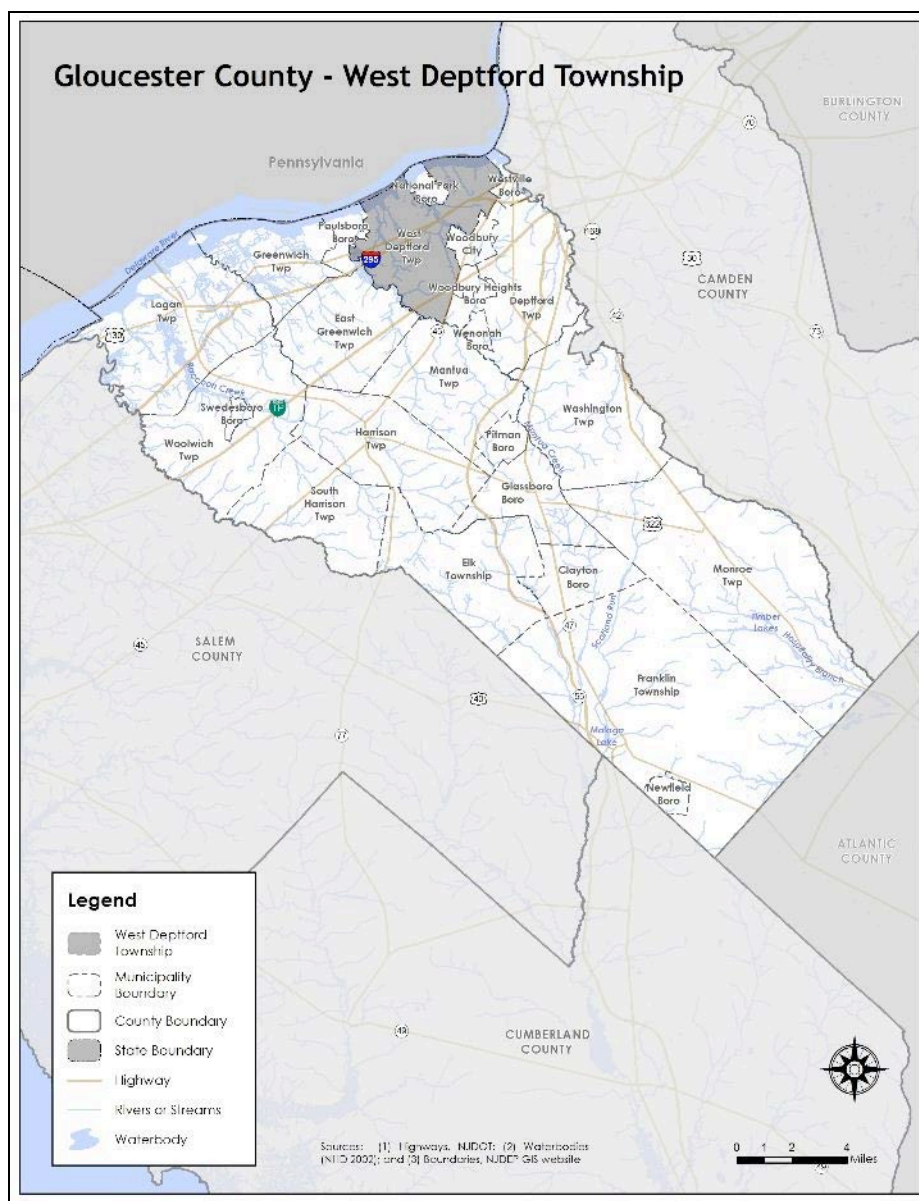
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

West Deptford Township is located in the northeastern corner of Gloucester County (See Figure GC.21-1).

Figure GC.21-1: West Deptford Township (Gloucester County) Location Map

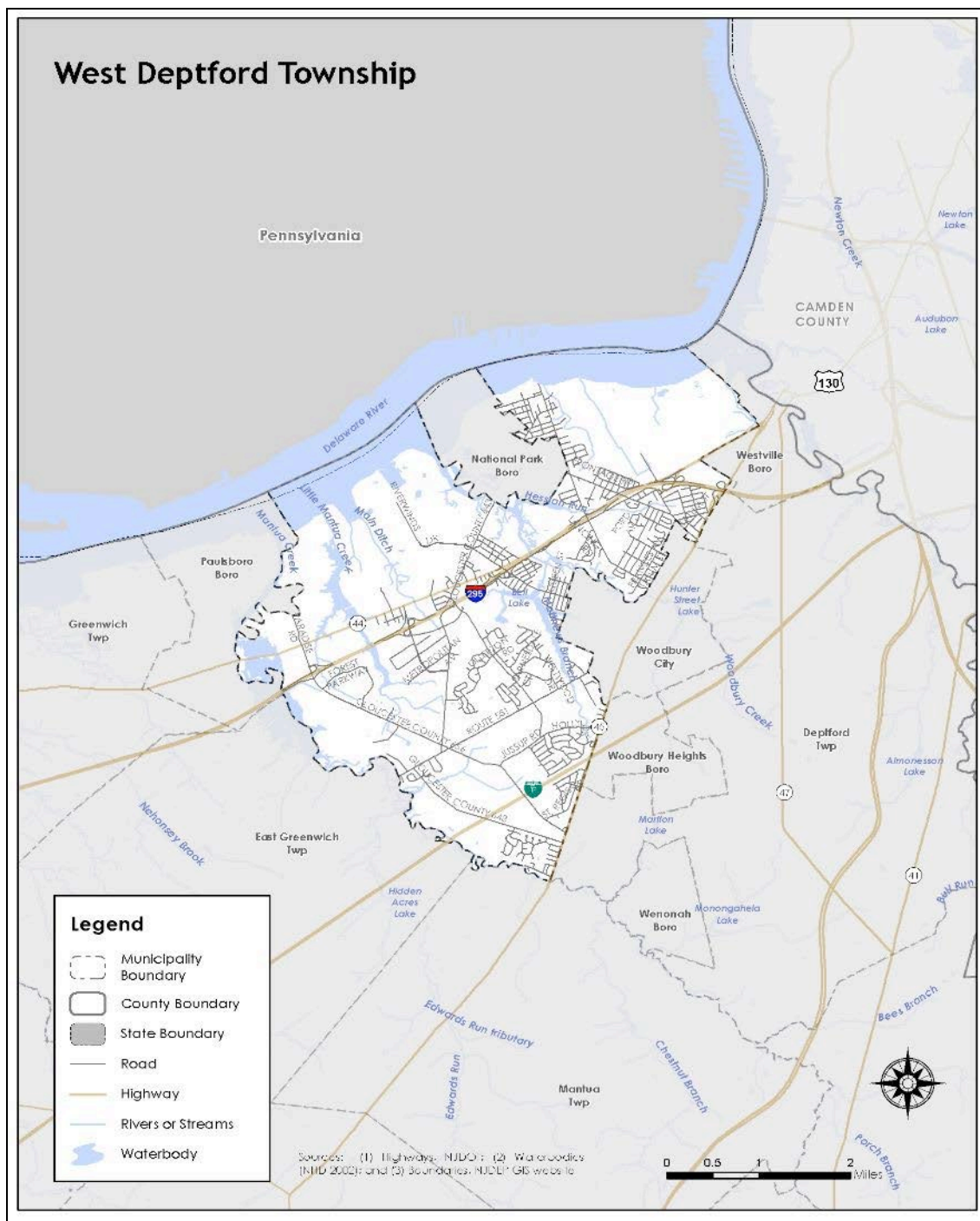


Part 3: Hazard Identification and Risk Assessment

West Deptford Township is an urban area based on the Delaware River. The Township is home to a variety of industries and leading companies. Unincorporated communities in the municipality include Colonial Manor, Greenfields Village, Red Bank, and Thorofare.

Per Figure GC.21-2, the major water courses include the Delaware River and Mantua Creek. Major transportation routes include Interstate 295 and the New Jersey Turnpike. The land is predominantly flat.

Figure GC.21-2: West Deptford Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.21-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.21-3: West Deptford Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	West Deptford Township	Gloucester County	Region	New Jersey
2000 Population	19,368	254,673	974,328	8,414,350
2010 Population	21,677	288,288	1,024,926	8,791,894
Percent Change	11.92%	13.2%	5.19%	4.49%
Population Density	1,406.6 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	15.41 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	21.6	24.4	24.1	23.5
% of Population 18 - 64	64.0	63.2	62.7	63
% of Population 65 and over	14.4	12.4	13.2	13.5

Table GC.21-4 illustrates how West Deptford Township ranks in the county, the four county region, and New Jersey.

Table GC.21-4: West Deptford Township Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	4	13	118
Land Area Rank	11	37	168
Population Density Rank	12	48	345
Population Change Rank	10	17	-

Table GC.21-5 includes information related to economic and housing statistics for West Deptford Township, Gloucester County, the four county region, and New Jersey.

Table GC.21-5: West Deptford Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	West Deptford Township	Gloucester County	Region	New Jersey
Date Incorporated	March 1, 1871	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$69,316	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	9,441	109,796	397,990	3,529,033
Occupied Housing Units	8,829	104,271	372,472	3,176,069
Vacant Housing Units	612	5,525	25,518	352,964
Owner Occupied Housing Units	6,387	83,525	266,593	2,126,279

Part 3: Hazard Identification and Risk Assessment

	West Deptford Township	Gloucester County	Region	New Jersey
Renter Occupied Housing Units	2,442	20,746	105,879	1,049,790
Building Permits	6	716	1,554	13,535
Largest Industry	Educational Services; health care and social assistance; mining, quarrying, and oil and gas extraction; and manufacturing	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

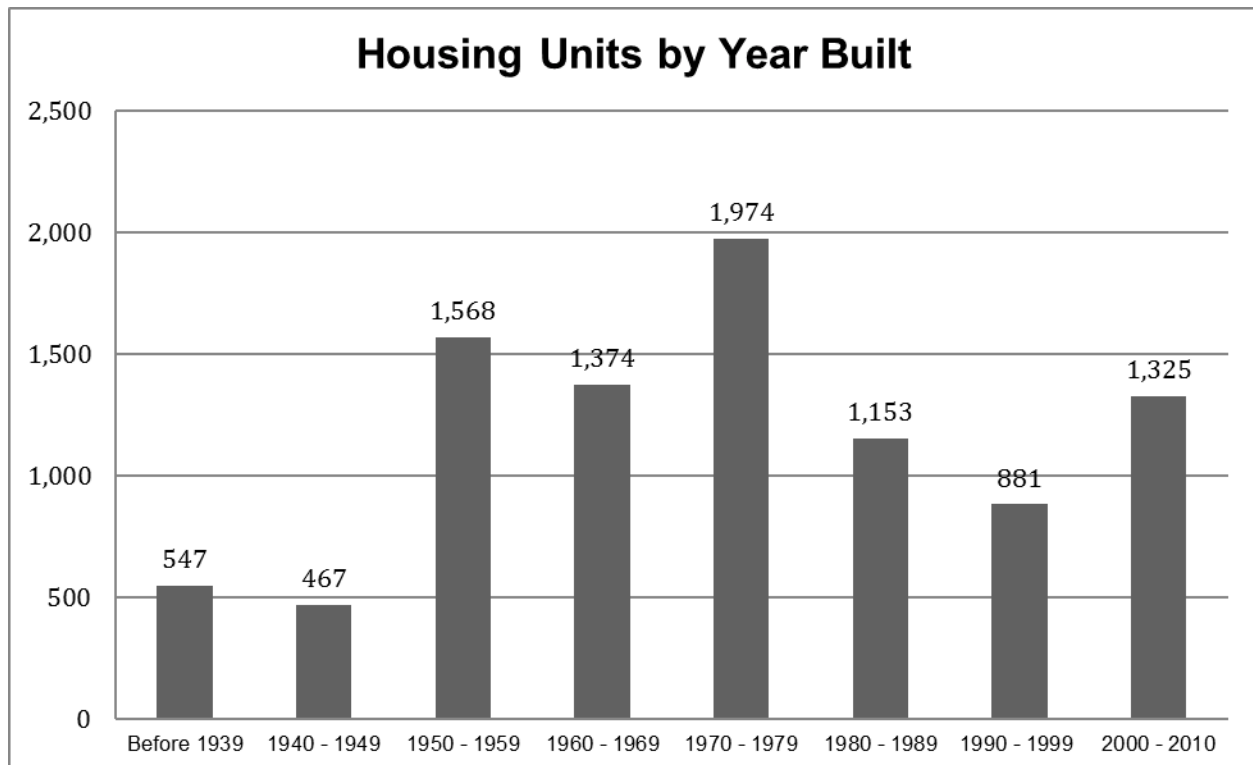
Table GC.21-6 illustrates how West Deptford Township ranks in the county and the four county region.

Table GC.21-6: West Deptford Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	12	30
Vacant Housing Rank	2	12
Renter Occupied Housing Rank	3	14
Building Permits	12	38

Figure GC.21-3 4 illustrates development patterns in West Deptford Township by examining housing units by year built. Nearly 21% of homes in West Deptford Township were built during the 1970s.

Figure GC.21-3: West Deptford Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Flood

Moderate Priority

- Severe Weather – Winter

Low Priority

- Coastal Erosion & Sea Level Rise
- Dam Failure
- Drought
- Earthquake
- Extreme Temperature: Cold & Hot
- High Wind
- Levee Failure
- Severe Weather – Summer
- Wildfire

One additional hazard was discussed but was not considered applicable to the municipality:

- Geologic Hazards

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.21-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.21-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge)	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where inundation due to storm surge may occur
Table RP.D-81	Levee Failure	Levee Inventory	Provide information about levee configuration
Figure RP.D-85	Levee Failure	Levee Locations	Identify locations of levees in and around the municipality
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.21-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.21-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.21-8: West Deptford Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Township Hall	Municipal	Administrative Offices	400 Crown Point Road, Thorofare		Y ²	Y ³		M-5 / M-10
CF-2	Emergency Operations Center	EOC	Co-located Facility	400 Crown Point Road, Thorofare	CF-1	Y	Y		
CF-3	Police Station	Law Enforcement Facilities	Stations	400 Crown Point Road, Thorofare	CF-1	Y	Y	Includes a holding cell	
CF-4	Greenfields Fire Association	FireStation	Stations	31 Budd Boulevard , Woodbury		Y	Y		
CF-5	Colonial Manor Fire Association	FireStation	Stations	611 Academy Avenue, Woodbury		Y	Y		M-6
CF-6	Thorofare Volunteer Fire Company	FireStation	Stations	61 Firehouse Lane, Thorofare		Y	Y		M-7
CF-7	Verga Fire Company	FireStation	Stations	1415 Crown Point Road, Westville		Y			
CF-8	Public Works	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	120 Grove Road, Thorofare		N	Y	Alternate EOC location	M-8
CF-9	Well #3	Utilities – Water	Wellheads	999 Jessup Road, West Deptford	CF-18	N/A	Y ⁴		
CF-10	Well #4	Utilities – Water	Wellheads	112 Parkville Station Road, West Deptford		N/A	Y ⁴		
CF-11	Well #5	Utilities – Water	Wellheads	962 Kings Highway, West Deptford		N/A	Y ⁴		
CF-12	Well #6	Utilities – Water	Wellheads	840 West Red Bank Avenue, Woodbury	CF-15	N/A	Y ⁴		

² Shelter of last resort.

³ Back-up generator provides partial building coverage for emergency lighting.

⁴ All West Deptford Township utility critical facilities have either direct back-up emergency power capabilities or the hook-up configuration for portable generators.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-13	Well #7	Utilities – Water	Wellheads	621 Academy Avenue, Westville		N/A	Y ⁴		
CF-14	Well #8	Utilities – Water	Wellheads	Parkville Station Road		N/A	Y ⁴		
CF-15	.5 MG Water Tank	Utilities – Water	Water Towers	840 West Red Bank Avenue, Woodbury		N/A	Y ⁴		
CF-16	2.0 MG Water Tank	Utilities – Water	Water Towers	261 Jessup Road West Deptford		N/A	Y ⁴		
CF-17	.5 MG Water Tank	Utilities – Water	Water Towers	690 Mantua Grove Road, West Deptford		N/A	Y ⁴		
CF-18	MG Water Tank	Utilities – Water	Water Towers	999 Jessup Road, West Deptford		N/A	Y ⁴		
CF-19	Sewer Pump Station #1	Utilities – Wastewater	Pump Stations / Lift Stations	167 Grove Avenue, West Deptford		N/A	Y ⁴		
CF-20	Sewer Pump Station #2	Utilities – Wastewater	Pump Stations / Lift Stations	1501 Red Bank Avenue, West Deptford		N/A	Y ⁴		
CF-21	Sewer Pump Station #3	Utilities – Wastewater	Pump Stations / Lift Stations	184 Philadelphia Avenue, West Deptford		N/A	Y ⁴		
CF-22	Sewer Pump Station #4	Utilities – Wastewater	Pump Stations / Lift Stations	1660 Crown Point Road, West Deptford		N/A	Y ⁴		
CF-23	Sewer Pump Station #5	Utilities – Wastewater	Pump Stations / Lift Stations	1 Ford Avenue, West Deptford		N/A	Y ⁴		
CF-24	Sewer Pump Station #6	Utilities – Wastewater	Pump Stations / Lift Stations	603 Prince Street, Woodbury		N/A	Y ⁴		
CF-25	Sewer Pump Station #7	Utilities – Wastewater	Pump Stations / Lift Stations	St. Regis Drive, Woodbury		N/A	Y ⁴		
CF-26	Sewer Pump Station #8	Utilities – Wastewater	Pump Stations / Lift Stations	46 West First Avenue, Runnemede		N/A	Y ⁴		
CF-27	Sewer Pump Station #9	Utilities – Wastewater	Pump Stations / Lift Stations	Locksley Lane, Woodbury		N/A	Y ⁴		
CF-28	Sewer Pump Station #10	Utilities – Wastewater	Pump Stations / Lift Stations	238 Crown Point Road, West Deptford		N/A	Y ⁴		

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-29	Sewer Pump Station #11	Utilities – Wastewater	Pump Stations / Lift Stations	1735 Route 295 / Crown Point Road, West Deptford		N/A	Y ⁴		
CF-30	Sewer Pump Station #12	Utilities – Wastewater	Pump Stations / Lift Stations	151 Parkville Road, West Deptford		N/A	Y ⁴		
CF-31	Sewer Pump Station #13	Utilities – Wastewater	Pump Stations / Lift Stations	1751 Imperial Way, Paulsboro		N/A	Y ⁴		
CF-32	Sewer Pump Station #14	Utilities – Wastewater	Pump Stations / Lift Stations	1449 Metropolitan Avenue, West Deptford		N/A	Y ⁴		
CF-33	Sewer Pump Station #15	Utilities – Wastewater	Pump Stations / Lift Stations	1204 Forest Parkway, Paulsboro		N/A	Y ⁴		
CF-34	Sewer Pump Station #16	Utilities – Wastewater	Pump Stations / Lift Stations	1316 Barnesdale Road, Woodbury		N/A	Y ⁴		
CF-35	Sewer Pump Station #17	Utilities – Wastewater	Pump Stations / Lift Stations	1228 Royal Lane, West Deptford		N/A	Y ⁴		
CF-36	Sewer Pump Station #18	Utilities – Wastewater	Pump Stations / Lift Stations	1123 Parliament Way, West Deptford		N/A	Y ⁴		
CF-37	Sewer Pump Station #19	Utilities – Wastewater	Pump Stations / Lift Stations	1621 Pennfield Drive, West Deptford		N/A	Y ⁴		
CF-38	Sewer Pump Station #20	Utilities – Wastewater	Pump Stations / Lift Stations	37 Phoenix Drive Plant, West Deptford		N/A	Y ⁴		
CF-39	Sewer Pump Station #21	Utilities – Wastewater	Pump Stations / Lift Stations	103 Jobstown Road, West Deptford		N/A	Y ⁴		
CF-40	Sewer Pump Station #22	Utilities – Wastewater	Pump Stations / Lift Stations	900 Riverwinds Drive, West Deptford		N/A	Y ⁴		
CF-41	Sewer Pump Station #23	Utilities – Wastewater	Pump Stations / Lift Stations	River Drive Road (Kings Crossing), West Deptford		N/A	Y ⁴		
CF-42	Sewer Pump Station #24	Utilities – Wastewater	Pump Stations / Lift Stations	791 Grove Road (Grande), West Deptford		N/A	Y ⁴		

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-43	Green-Fields Elementary School	Schools	Public Schools	15 Hill Lane, Woodbury		N	Y ⁵		
CF-44	Red Bank Elementary School	Schools	Public Schools	192 Philadelphia Avenue, Thorofare		Y	Y ⁵		
CF-45	Oakview Elementary School	Schools	Public Schools	350 Dubois Avenue, Woodbury		Y	Y ⁵		
CF-46	West Deptford Middle School	Schools	Public Schools	675 Grove Road, West Deptford		N	Y ⁵		
CF-47	West Deptford High School	Schools	Public Schools	1600 Old Crown Point Road, Westville		Y	Y		
CF-48	Children Montessori School	Schools	Private Schools	730 Barlow Avenue, Woodbury		N	Y ⁵		
CF-49	ManorCare Health Services – West Deptford	Health Care Facilities	Private Rehabilitation Centers	550 Jessup Road, West Deptford		N ⁶	Y		
CF-50	Community Center	Other Municipal	Community Center	1000 Riverwinds Drive, West Deptford		Y ²	Y		
CF-51	West Deptford Public Library	Emergency Staging Areas	Equipment Mobilization	420 Crown Point Road, West Deptford		Y	Y		

⁵ All West Deptford Township schools have back-up emergency power generators that are capable of powering sections and critical equipment during power outages.

⁶ Shelter in place.

Part 3: Hazard Identification and Risk Assessment

Table GC.21-9: West Deptford Township (Gloucester County) Critical Facilities Hazard Exposure⁷

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Township Hall	N/A	N/A	N/A											
CF-2	Emergency Operations Center	N/A	N/A	N/A											
CF-3	Police Station	N/A	N/A	N/A											
CF-4	Greenfields Fire Association	N/A	N/A	N/A											
CF-5	Colonial Manor Fire Association	N/A	N/A	N/A											
CF-6	Thorofare Volunteer Fire Company	N/A	N/A	N/A											
CF-7	Verga Fire Company	N/A	N/A	N/A											
CF-8	Public Works	N/A	N/A	N/A											
CF-9	Well #3	N/A	N/A	N/A											
CF-10	Well #4	N/A	N/A	N/A											
CF-11	Well #5	N/A	N/A	N/A											
CF-12	Well #6	N/A	N/A	N/A											
CF-13	Well #7	N/A	N/A	N/A											
CF-14	Well #8	N/A	N/A	N/A											
CF-15	.5 MG Water Tank	N/A	N/A	N/A											
CF-16	2.0 MG Water Tank	N/A	N/A	N/A											
CF-17	.5 MG Water Tank	N/A	N/A	N/A											
CF-18	MG Water Tank	N/A	N/A	N/A											
CF-19	Sewer Pump Station #1	N/A	N/A	N/A											
CF-20	Sewer Pump Station #2	N/A	N/A	N/A											
CF-21	Sewer Pump Station #3	N/A	N/A	N/A											

⁷ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-22	Sewer Pump Station #4	N/A	N/A	N/A											
CF-23	Sewer Pump Station #5	N/A	N/A	N/A											
CF-24	Sewer Pump Station #6	N/A	N/A	N/A											
CF-25	Sewer Pump Station #7	N/A	N/A	N/A											
CF-26	Sewer Pump Station #8	N/A	N/A	N/A											
CF-27	Sewer Pump Station #9	N/A	N/A	N/A											
CF-28	Sewer Pump Station #10	N/A	N/A	N/A											
CF-29	Sewer Pump Station #11	N/A	N/A	N/A											
CF-30	Sewer Pump Station #12	N/A	N/A	N/A											
CF-31	Sewer Pump Station #13	N/A	N/A	N/A											
CF-32	Sewer Pump Station #14	N/A	N/A	N/A											
CF-33	Sewer Pump Station #15	N/A	N/A	N/A											
CF-34	Sewer Pump Station #16	N/A	N/A	N/A											
CF-35	Sewer Pump Station #17	N/A	N/A	N/A											
CF-36	Sewer Pump Station #18	N/A	N/A	N/A											
CF-37	Sewer Pump Station #19	N/A	N/A	N/A											
CF-38	Sewer Pump Station #20	N/A	N/A	N/A											
CF-39	Sewer Pump Station #21	N/A	N/A	N/A											

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-40	Sewer Pump Station #22	N/A	N/A	N/A											
CF-41	Sewer Pump Station #23	N/A	N/A	N/A											
CF-42	Sewer Pump Station #24	N/A	N/A	N/A											
CF-43	Green-Fields Elementary School	N/A	N/A	N/A											
CF-44	Red Bank Elementary School	N/A	N/A	N/A											
CF-45	Oakview Elementary School	N/A	N/A	N/A											
CF1-46	West Deptford Middle School	N/A	N/A	N/A											
CF-47	West Deptford High School	N/A	N/A	N/A											
CF-48	Children Montessori School	N/A	N/A	N/A											
CF-49	ManorCare Health Services – West Deptford	N/A	N/A	N/A											
CF-50	Community Center	N/A	N/A	N/A											
CF-51	West Deptford Public Library	N/A	N/A	N/A											

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures, in particular for Repetitive and Severe Repetitive Flood Loss Properties
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.21-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.21-10.

Table GC.21-10: Status of West Deptford Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
West Deptford 1: Elevation of private trailers and improvements to berm around Willow Wood Trailer Park located off of Crown Point Road.	Completed	Issue was resolved through funds provided by private company managing Willow Wood Trailer Park. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
West Deptford 2: Elevation and easements on West 1st Avenue between Mantua and West Deptford municipalities.	Completed	Issue was resolved through capital improvement funds and special bonds. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A

Table GC.21-10 Notes:

- A. See Tables GC.21-11 and GC.21-12 for municipal (M-#) mitigation measures
- B. See Table GC.21-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.21-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Table GC.21-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.21-4.

Table GC.21-11: West Deptford Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.²	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #2	Existing
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both

¹ See Section 3: Hazard Identification and Risk Assessment and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-5	Upgrade permanent back-up emergency power generator at Municipal Hall on 400 Crown Point Road (CF-1).	All	Goal #4	Both
M-6	Upgrade permanent back-up emergency power generator at Colonial Manor Fire Association (CF-5).	All	Goal #4	Both
M-7	Upgrade permanent back-up emergency power generator at Thorofare Fire Association (CF-6).	All	Goal #4	Both
M-8	Upgrade permanent back-up emergency power generator at Public Works facility (CF-8).	All	Goal #4	Both
M-9	Address identified Repetitive Flood Loss / Severe Repetitive Flood Loss Properties.	Flood	Goal #4	Both
M-10	Harden / retrofit Municipal Hall located on 400 Crown Point Road, to include upgrading doors & roof (CF-1).	High Wind	Goal #4	Both

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.21-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria³
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁴
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.21-12: West Deptford Township (Gloucester County) Municipal Mitigation Measures Implementation

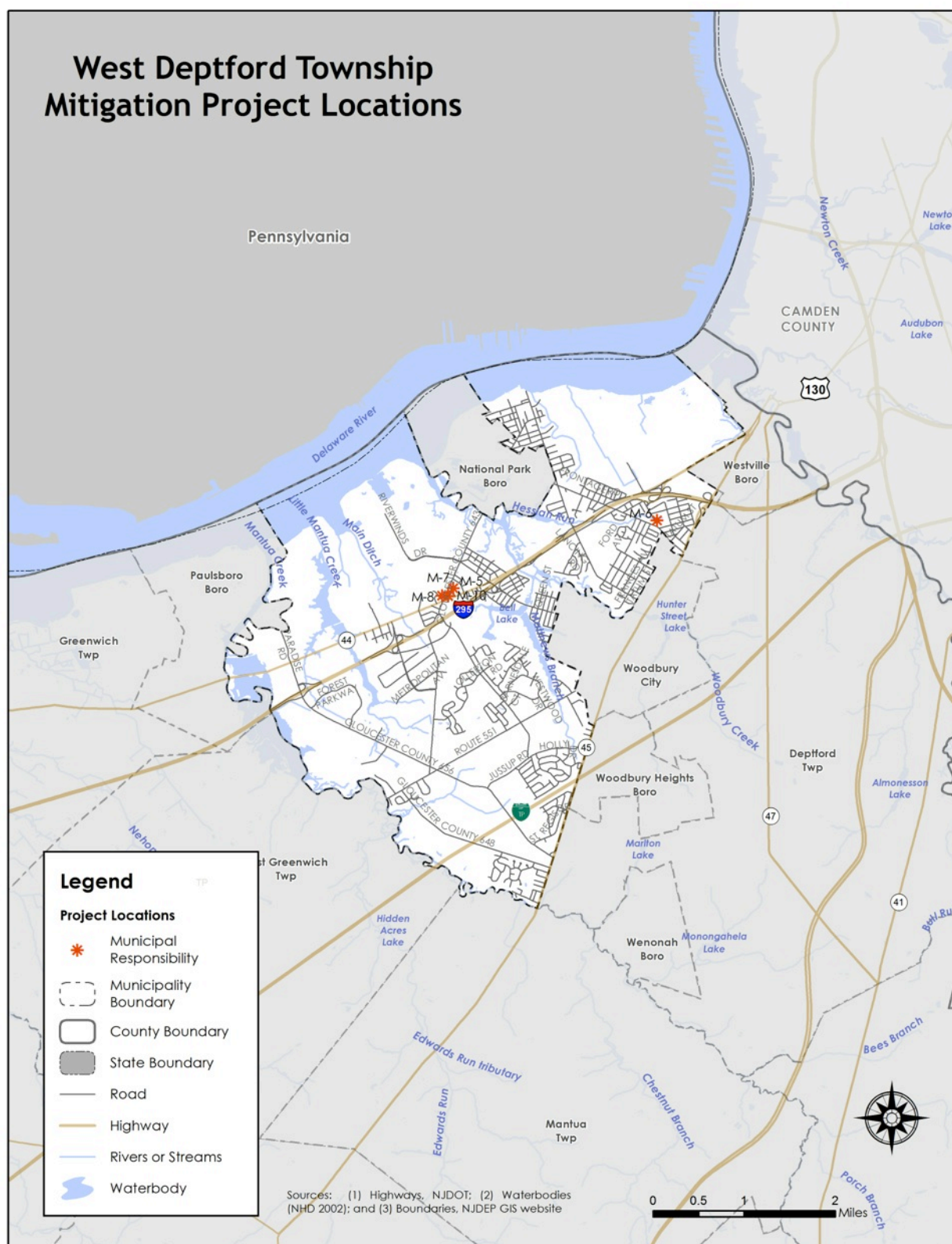
#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Low	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).

³ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	High	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.
M-5	Upgrade permanent back-up emergency power generator at Municipal Hall on 400 Crown Point Road (CF-1).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Upgrade permanent back-up emergency power generator at Colonial Manor Fire Association (CF-5).	Municipal OEM, Public Works Department, and Fire Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-7	Upgrade permanent back-up emergency power generator at Thorofare Fire Association (CF-6).	Municipal OEM, Public Works Department, and Fire Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-8	Upgrade permanent back-up emergency power generator at Public Works facility (CF-8).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-9	Address identified Repetitive Flood Loss / Severe Repetitive Flood Loss Properties.	Floodplain Administrator	High	Private Property Flood Mitigation	Staff time	On going	Identify mitigation options include eligible activities per FEMA HMA programs.
M-10	Harden / retrofit Municipal Hall located on 400 Crown Point Road, to include upgrading doors & roof (CF-1).	Municipal OEM and Public Works Department	High	Building Retrofit	\$100K - \$500K	One to three years	Conduct project scoping.



Part 4: Mitigation Measures

Part 4.5: Plan Review and Integration

Part 4.5 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan (2008)
- Master Plan (2009)
- Land Use Development Ordinance⁹
- Floodplain Control Ordinance⁵
- Stormwater Control Ordinance
- Stormwater Control Procedures

⁵ <http://clerkshq.com/default.ashx?clientsite=WestDeptford-nj>

Attachment A: Public Review Comments

The following comments were received during the public review of the West Deptford Township Municipal Appendix:

Table GC.21.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of May 29, 2015, no public review comments were received for the West Deptford Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.22
Westville Borough, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.22-i
Part 1 Overview	GC.22-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.22-1
1.2: Westville Borough (Gloucester County) Municipal Appendix	GC.22-1
Part 2 Participation	GC.22-2
2.1: Municipal Working Group Participation	GC.22-2
2.2: Public Participation	GC.22-4
Part 3 Hazard Identification and Risk Assessment	GC.22-5
3.1: Municipal Profile	GC.22-5
3.2: Hazard Priorities	GC.22-9
3.3: Hazard Mapping	GC.22-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.22-11
Part 4 Mitigation Measures	GC.22-14
4.1: Mitigation Goals and Strategy	GC.22-14
4.2: SDVR HMP Mitigation Measures	GC.22-15
4.3: Municipal Mitigation Measures – Identification	GC.22-16
4.4: Municipal Mitigation Measures – Implementation	GC.22-17
4.5: Multi-Jurisdictional Mitigation Measures	GC.22-19
4.6: Plan Review and Integration	GC.22-21

Table of Contents

List of Figures

Figure GC.22-1: Westville Borough (Gloucester County) Location Map	GC.22-5
Figure GC.22-2: Westville Borough Base Map	GC.22-6
Figure GC.22-3: Westville Borough Housing Units by Year Built	GC.22-8
Figure GC.22-4: Westville Borough Mitigation Project Locations	GC.22-20

List of Tables

Table GC.22-1: Westville Borough (Gloucester County) Working Group	GC.22-2
Table GC.22-2: Public Participation	GC.22-4
Table GC.22-3: Westville Borough Demographics	GC.22-7
Table GC.22-4: Westville Borough Demographic Rankings	GC.22-7
Table GC.22-5: Westville Borough Economics and Housing	GC.22-7
Table GC.22-6: Westville Borough Ranking (Economics and Housing)	GC.22-8
Table GC.22-7: Supporting Mapping and Exhibits	GC.22-10
Table GC.22-8: Westville Borough Critical Facilities Inventory	GC.22-12
Table GC.22-9: Westville Borough Critical Facilities Hazard Exposure	GC.22-13
Table GC.22-10: Status of Westville Borough SDVR HMP Mitigation Measures	GC.22-15
Table GC.22-11: Westville Borough Municipal Mitigation Measures Identification	GC.22-16
Table GC.22-12: Westville Borough Municipal Mitigation Measures Implementation	GC.22-17
Table GC.22-13: Westville Borough Multi-Jurisdictional Mitigation Measures	GC.22-19

Attachments

Attachment GC.22.A: Public Review Comments	GC.22.A-1
Attachment GC.22.B: Adoption Resolution	GC.22.B-1
Attachment GC.22.C: Approval Letter	GC.22.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Westville Borough (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Westville Borough in Gloucester County, New Jersey.

The Westville Borough Municipal Working Group recommended the Westville Borough (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Westville Borough Council adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.22-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.22-1: Westville Borough (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Bill	Bittner	Westville Borough Office of Emergency Management	OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Christine	Helder	Westville Borough Administration Department	Municipal Clerk	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Provided municipal documents for review.
Robert	Kunkle	Westville Borough Construction Department	Construction Office / Floodplain Administrator	<input checked="" type="checkbox"/>		
Jonathan	Bryson	Westville Borough Engineering Department	Borough Engineer	<input checked="" type="checkbox"/>		
William	Whinna	Westville Borough Police Department	Chief of Police	<input checked="" type="checkbox"/>		
Tyrone	Reeves	Straight-Line Church	Pastor	<input checked="" type="checkbox"/>		
Omega	Reeves	Straight-Line Church	Executive Administrator	<input checked="" type="checkbox"/>		
Michael	Cerrato		Westville Borough Resident	<input checked="" type="checkbox"/>		

¹ Round 1 Work Session was held on June 26, 2014.

² Round 2 Work Session was held on September 11, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.22-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Richard	Koestu		Westville Borough Resident	☑		
Christine	Oerlemans		Westville Borough Resident	☑	☑	
Rosalie	Fanelli		Westville Borough Resident		☑	
Vince	Fanelli		Westville Borough Resident		☑	
Dorothy	Jenkins		Westville Borough Resident		☑	
Donald E.	Oerlemans		Westville Borough Resident		☑	
Florence	Ralls		Westville Borough Resident		☑	
Ronald	Ralls		Westville Borough Resident		☑	
John	Smith		Westville Borough Resident		☑	

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Elected Officials
- Land Use / Economic Development Planner
- Fire
- Emergency Medical Services
- Business Associations
- Major Employers and Businesses
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Healthcare Institutions

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.22-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.22-2: Public Participation

Date	Type of Involvement	Location
August 6, 2014	Link to Project Website (http://nj4hmp.com) established	Westville, NJ website ⁵
August 6, 2014	Flyers posted	Westville Borough Post Office, Library, & Bank
December 18, 2014	Preliminary Municipal Appendix posted to website for public comment	Westville, NJ website ⁵
February 9, 2015	Public hearing providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Westville Borough Council Chambers
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁶ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁷

⁵ <http://www.westville-nj.com/home/>

⁶ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁷ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

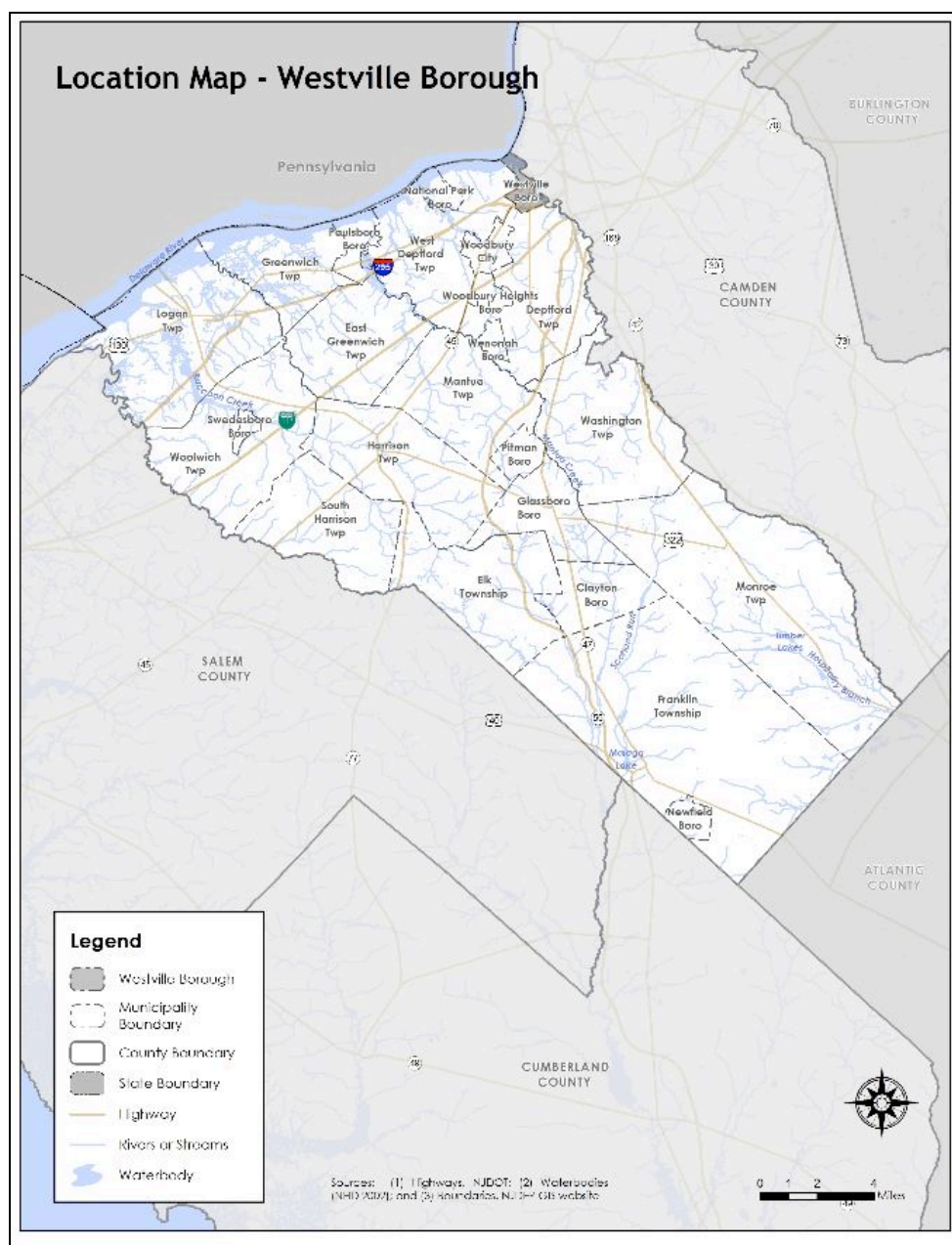
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Westville Borough is located in the northeastern corner of Gloucester County (See Figure GC.22-1).

Figure GC.22-1: Westville Borough (Gloucester County) Location Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.22-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.22-3: Westville Borough Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Westville Borough	Gloucester County	Region	New Jersey
2000 Population	4,500	254,673	974,328	8,414,350
2010 Population	4,288	288,288	1,024,926	8,791,894
Percent Change	-4.71%	13.2%	5.19%	4.49%
Population Density	4,187.0 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	1.02 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	20.4	24.4	24.1	23.5
% of Population 18 - 64	68.0	63.2	62.7	63
% of Population 65 and over	11.6	12.4	13.2	13.5

Table GC.22-4 illustrates how Westville Borough ranks in the county, the four county region, and New Jersey.

Table GC.22-4: Westville Borough Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	17	55	399
Land Area Rank	21	74	485
Population Density Rank	2	18	143
Population Change Rank	23	80	-

Table GC.22-5 includes information related to economic and housing statistics for Westville Borough, Gloucester County, the four county region, and New Jersey.

Table GC.22-5: Westville Borough Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Westville Borough	Gloucester County	Region	New Jersey
Date Incorporated	April 28, 1914	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$49,854	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	1,912	109,796	397,990	3,529,033
Occupied Housing Units	1,755	104,271	372,472	3,176,069
Vacant Housing Units	157	5,525	25,518	352,964
Owner Occupied Housing Units	1,137	83,525	266,593	2,126,279
Renter Occupied Housing Units	618	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Westville Borough	Gloucester County	Region	New Jersey
Building Permits	0	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

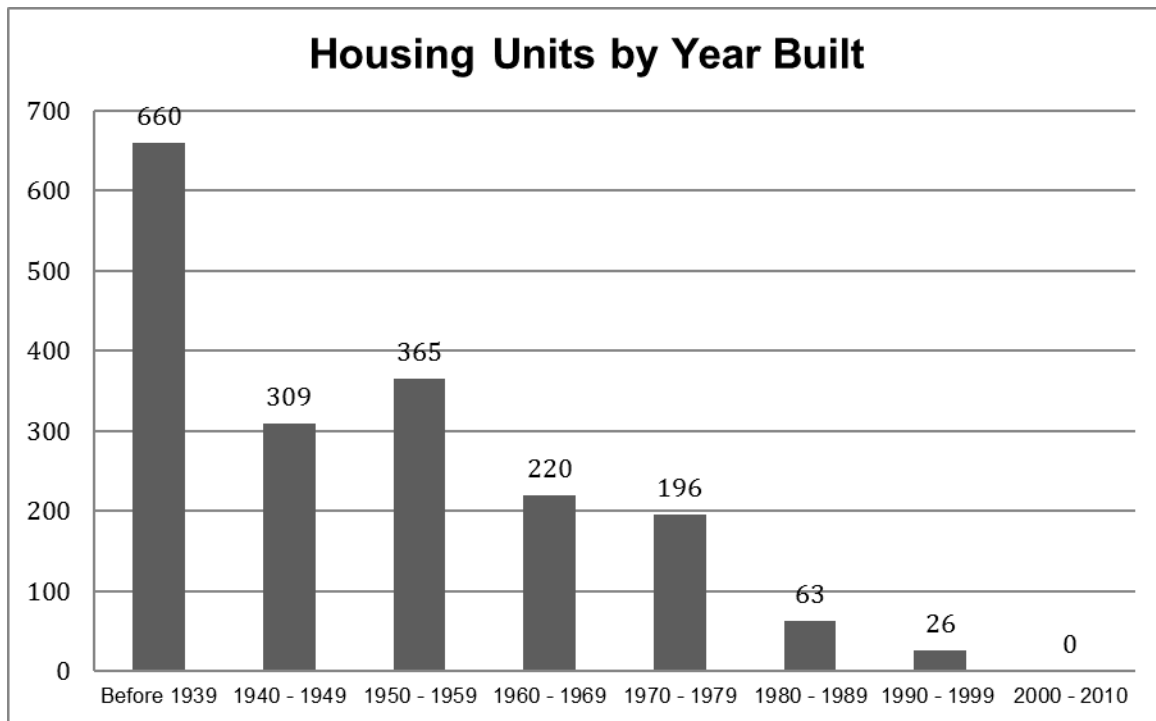
Table GC.22-6 illustrates how Westville Borough ranks in the county and the four county region.

Table GC.22-6: Westville Borough Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	23	75
Vacant Housing Rank	12	42
Renter Occupied Housing Rank	10	37
Building Permits Rank	23	86

Figure GC.22-3 4 illustrates development patterns in Westville Borough by examining housing units by year built. About 35% of homes in Westville Borough were built prior to 1939.

Figure GC.22-3: Westville Borough Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Coastal Erosion & Sea Level Rise
- Flood
- Severe Weather – Summer

Moderate Priority

- Earthquake
- Extreme Temperature: Cold & Hot
- High Wind
- Severe Weather – Winter

Low Priority

- Dam Failure
- Drought
- Levee Failure
- Wildfire

One additional hazard was discussed but was not considered applicable to the municipality:

- Geologic Hazards

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.22-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.22-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge)	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where inundation due to storm surge may occur
Table RP.D-81	Levee Failure	Levee Inventory	Provide information about levee configuration
Figure RP.D-85	Levee Failure	Levee Locations	Identify locations of levees in and around the municipality
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.22-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.22-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.22-8: Westville Borough (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Borough Hall	Municipal	Administrative	165 Broadway, Westville	CF-2	N	Y		
CF-2	Emergency Operations Center	EOC	Co-located Facilities	165 Broadway, Westville	CF-1	N	Y		
CF-3	Westville Police Department	Law Enforcement Facilities	Stations	167 Broadway, Westville	CF-5	N	Y		
CF-4	Westville Fire Department	FireStation	Stations	23 West Olive Street, Westville		Y	Y		
CF-5	Public Works	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	114 Crown Point Road, Westville	CF-3	N	Y		
CF-6	Parkview Elementary School	Schools	Public Schools	101 Birch Avenue, Westville		N	N		M-4
CF-7	St. Anne's Parish Parking Lot	Emergency Staging Areas	Parking Lot	Highland Avenue and Route 45		N ²	N/A		
CF-8	Parking Lot	Emergency Staging Areas	Parking Lot	114 Crown Point Road, Westville		N ²	N/A		

² Westville Borough residents utilize parking lots during flood events to protect private property.

Part 3: Hazard Identification and Risk Assessment

Table GC.22-9: Westville Borough (Gloucester County) Critical Facilities Hazard Exposure³

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Borough Hall	N/A	N/A	N/A											
CF-2	Emergency Operations Center	N/A	N/A	N/A											
CF-3	Westville Police Department	N/A	N/A	N/A											
CF-4	Westville Fire Department	N/A	N/A	N/A											
CF-5	Public Works	N/A	N/A	N/A											
CF-6	Parkview Elementary School	N/A	N/A	N/A											
CF-7	St. Anne's Parish Parking Lot	N/A	N/A	N/A											
CF-8	Parking Lot	N/A	N/A	N/A											

³ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures, in particular for Repetitive Flood Loss properties.
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.22-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.22-10.

Note: Westville Borough did not participate in the SDVR Hazard Mitigation Plan. Therefore, there are no mitigations measures that were previously identified for the municipality.

Table GC.22-10: Status of Westville Borough (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
N/A	N/A	N/A	N/A

Table GC.22-10 Notes:

- A. See Tables GC.22-11 and GC.22-12 for municipal (M-#) mitigation measures
- B. See Table GC.22-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.22-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Table GC.22-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.22-4.

Table GC.22-11: Westville Borough (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.²	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-4	Install permanent backup emergency power generator at Parkview Elementary School (CF-6).	All	Goal #4	Both

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-5	Conduct study to determine flood and erosion remedial related mitigation measures along Woodbine Avenue and Lake Martha.	Flood	Goal #4	Both
M-6	Elevate / acquire homes along Big Timber Creek, particularly around Route 47 bridge.	Flood	Goal #4	Existing
M-7	Elevate / acquire homes on Edge Water Avenue	Flood	Goal #4	Existing
M-8	Address any additional identified Repetitive Flood Loss Properties.	Flood	Goal #4	Existing

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.22-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria³
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁴
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.22-12: Westville Borough (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Moderate	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.

³ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-3	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.
M-4	Install permanent backup emergency power generator at Parkview Elementary School (CF-6).	Municipal OEM and School Board	Moderate	Back-up Power Generator	< \$100K	One to three years	Conduct project scoping.
M-5	Conduct study to determine flood and erosion remedial related mitigation measures along Woodbine Avenue and Lake Martha.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	< \$50K	One to three years	Develop scope of work for engineering study and procure professional consulting services.
M-6	Elevate / acquire homes along Big Timber Creek, particularly around Route 47 bridge.	Floodplain Administrator	Low	Private Property Flood Mitigation	\$100K - \$1M	Three to five years	Prior to initiating landowner contacts, identify flood insurance implications including eligible activities per FEMA HMPA programs.
M-7	Elevate / acquire homes on Edge Water Avenue	Floodplain Administrator	Low	Private Property Flood Mitigation	\$100K - \$1M	Three to five years	Prior to initiating landowner contacts, identify flood insurance implications and mitigation options including eligible activities per FEMA HMPA programs.
M-8	Address identified Repetitive Flood Loss Properties to include areas such as Big Timber Creek and Edge Water Avenue.	Floodplain Administrator	Moderate	Private Property Flood Mitigation	Staff time commitment	One year	Prior to initiating landowner contacts, identify flood insurance implications and mitigation options including eligible activities per FEMA HMPA programs.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.22-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

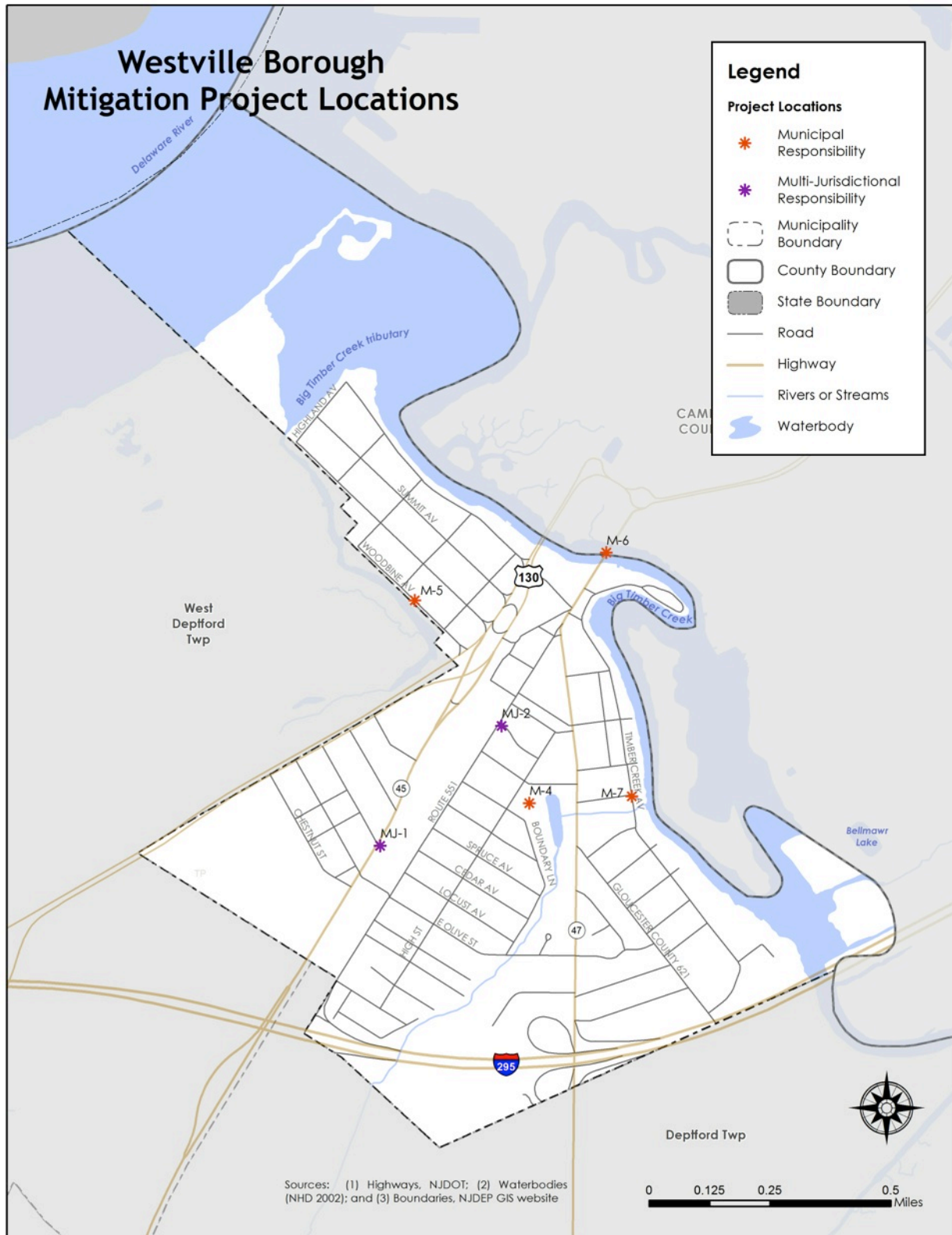
Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.22-4.

Table GC.22-13: Westville Borough (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
M-1	Improve drainage at New Jersey Route 45 and railroad.	Flood	Goal #4	Both	Municipal OEM, NJDOT	High
MJ-2	Improve drainage on Willow Drive between High Street and County Route 551 (Broadway).	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW	Moderate
MJ-3	Maintain duckbill valves along County Route 551 (Broadway).	Flood	Goal #4	Existing	Municipal OEM, NJ DOT	High

Part 4: Mitigation Measures

Figure GC.22-4: Westville Borough Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan – Base Plan (2010)⁵
- Flood Damage Prevention Ordinance⁶
- Master Plan Reexamination and Recommendations (2008)
- Land Use and Development Ordinance⁷
- Stormwater Control Ordinance⁸
- Stormwater Management Plan (2006)⁹
- Zoning Map¹⁰
- Zoning Ordinance

⁵ <http://westville-nj.com/borough-government/departments/emergency-management/>

⁶ <http://ecode360.com/14175357#14175357>

⁷ <http://ecode360.com/14175633#14175633>

⁸ <http://ecode360.com/14177307#14177307>

⁹ <http://westville-nj.com/useful-links/stormwater-management/>

¹⁰ <http://www.westville-nj.com/assets/forms/Downloadable-Forms/westvillezoningmap11x172009.pdf>

Attachment A: Public Review Comments

The following comments were received during the public review of the Westville Borough Municipal Appendix:

Table GC.22.A-1: Public Review Comments

Comment Date and Time	Comment	Response
February 9, 2015 (Westville Borough Council Meeting)	Resident recommended using Blue Acres grant funds to purchase repetitive flood loss properties.	NJDEP Blue Acres Grant Program is included in the options identified for funding acquisition projects for the NJ4 HMP (Annex F).

Note: As of April 17, 2015, no other public review comments were received for the Westville Borough Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.23
Woodbury City, New Jersey

May 29, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.23-i
Part 1 Overview	GC.23-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.23-1
1.2: Woodbury City (Gloucester County) Municipal Appendix	GC.23-1
Part 2 Participation	GC.23-2
2.1: Municipal Working Group Participation	GC.23-2
2.2: Public Participation	GC.23-4
Part 3 Hazard Identification and Risk Assessment	GC.23-5
3.1: Municipal Profile	GC.23-5
3.2: Hazard Priorities	GC.23-9
3.3: Hazard Mapping	GC.23-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.23-11
Part 4 Mitigation Measures	GC.23-16
4.1: Mitigation Goals and Strategy	GC.23-16
4.2: SDVR HMP Mitigation Measures	GC.23-17
4.3: Municipal Mitigation Measures – Identification	GC.23-18
4.4: Municipal Mitigation Measures – Implementation	GC.23-20
4.5: Multi-Jurisdictional Mitigation Measures	GC.23-23
4.6: Plan Review and Integration	GC.23-25

Table of Contents

List of Figures

Figure GC.23-1: Woodbury City (Gloucester County) Location Map	GC.23-5
Figure GC.23-2: Woodbury City Base Map	GC.23-6
Figure GC.23-3: Woodbury City Housing Units by Year Built	GC.23-8
Figure GC.23-4: Woodbury City Mitigation Project Locations	GC.23-24

List of Tables

Table GC.23-1: Woodbury City (Gloucester County) Working Group	GC.23-2
Table GC.23-2: Public Participation	GC.23-4
Table GC.23-3: Woodbury City Demographics	GC.23-7
Table GC.23-4: Woodbury City Demographic Rankings	GC.23-7
Table GC.23-5: Woodbury City Economics and Housing	GC.23-7
Table GC.23-6: Woodbury City Ranking (Economics and Housing)	GC.23-8
Table GC.23-7: Supporting Mapping and Exhibits	GC.23-10
Table GC.23-8: Woodbury City Critical Facilities Inventory	GC.23-12
Table GC.23-9: Woodbury City Critical Facilities Hazard Exposure	GC.23-14
Table GC.23-10: Status of Woodbury City SDVR HMP Mitigation Measures	GC.23-17
Table GC.23-11: Woodbury City Municipal Mitigation Measures Identification	GC.23-18
Table GC.23-12: Woodbury City Municipal Mitigation Measures Implementation	GC.23-20
Table GC.23-13: Woodbury City Multi-Jurisdictional Mitigation Measures	GC.23-23

Attachments

Attachment GC.23.A: Public Review Comments	GC.23.A-1
Attachment GC.23.B: Adoption Resolution	GC.23.B-1
Attachment GC.23.C: Approval Letter	GC.23.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Woodbury City (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Woodbury City in Gloucester County, New Jersey.

The Woodbury City Municipal Working Group recommended the Woodbury City (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Woodbury City Council adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.23-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.23-1: Woodbury City (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Joseph	Buono	Woodbury City OEM / Construction	Woodbury City Deputy OEM Coordinator / Fire Marshal	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
David	Swanson	Woodbury City Government / Emergency Management	Councilman / Deputy Office of Emergency Management		<input checked="" type="checkbox"/>	
Michael	Throkas	Woodbury City Government	Administrator		<input checked="" type="checkbox"/>	
Robert	Law	Woodbury City Finance	CFO / Deputy Administrator		<input checked="" type="checkbox"/>	
Randi	Woerner	Woodbury City Economic Development	Economic Development Director		<input checked="" type="checkbox"/>	
Paul	Brier	Engineering	Floodplain Administrator		<input checked="" type="checkbox"/>	
Robert	Kunkle	Woodbury City Construction Office	Construction Official		<input checked="" type="checkbox"/>	
John P.	Leech	Woodbury City Construction / Housing	Zoning Official / Housing Inspector		<input checked="" type="checkbox"/>	
Richard	Leidy	Woodbury City Public Works	Public Works Manager		<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on July 30, 2014.

² Round 2 Work Session was held on October 9, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.23-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Michael	McCauhey	Woodbury Public Works	Public Works Operations Manager		<input checked="" type="checkbox"/>	
Reed A.	Merinuk	Woodbury City Police Department	Police Chief		<input checked="" type="checkbox"/>	
Thomas	Ryan	Woodbury City Police Department	Police Captain		<input checked="" type="checkbox"/>	
Jeff	Pitzo	Woodbury City Police Department	Police Lieutenant		<input checked="" type="checkbox"/>	
Randall	Gartner	Woodbury City Fire Department	Fire Chief		<input checked="" type="checkbox"/>	
Jim	Bacia	Inspira Medical Center, Woodbury	Director, EMS, Preparedness, Security		<input checked="" type="checkbox"/>	
Kara	Huber	Woodbury City School District	School Business Administrator / Board Secretary		<input checked="" type="checkbox"/>	
Jean	Wipf	Woodbury City Public Library	Library Director		<input checked="" type="checkbox"/>	

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Business Associations
- Community / Faith-Based Organizations
- Non-Governmental Organizations

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- Transportation Department Directors / Supervisors
- Environmental Organization
- Critical Infrastructure and Key Resources

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.23-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.23-2: Public Participation

Date	Type of Involvement	Location
August 8, 2014	Flyers posted	Woodbury City Fire Station
September 9, 2014	Link to Project Website (http://nj4hmp.com) established	Woodbury, NJ webpage ⁵
November 25, 2014	Preliminary Municipal Appendix posted to website for public comment	Woodbury, NJ webpage ⁵
December 19, 2014	Preliminary Municipal Appendix posted to website for public comment	Woodbury, NJ webpage ⁵
May 12, 2015	Information item included on [City Council] agenda identifying opportunities for public participation	Woodbury City Hall
May 19, 2015	Public hearing included on Woodbury City Council agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Woodbury City Hall
May 22, 2015	Press release regarding hazard mitigation and plan development issued	South Jersey Times, Courier Post
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁶ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁷

⁵ <http://www.woodbury.nj.us/>

⁶ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁷ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

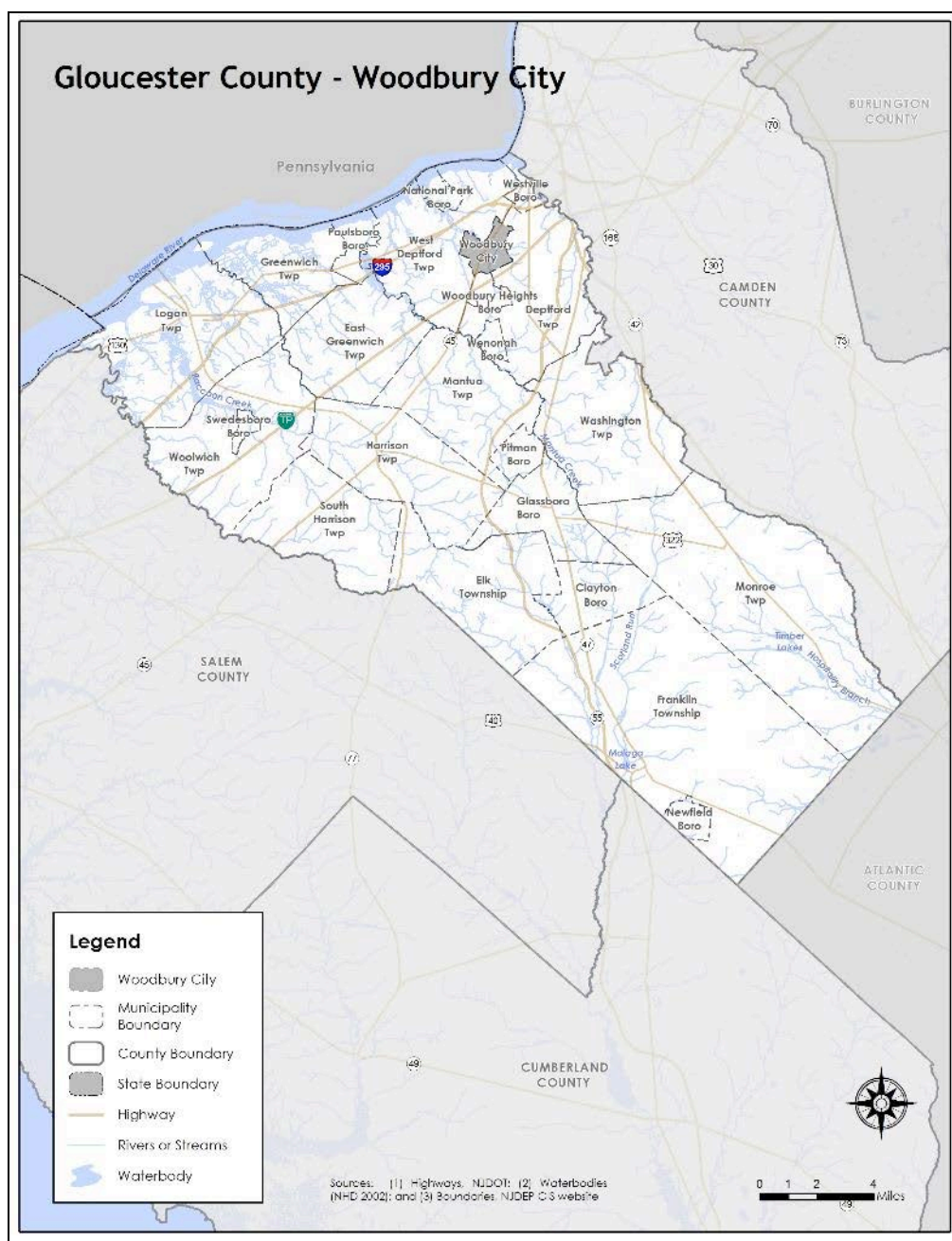
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Woodbury City is located in the northeastern part of Gloucester County (See Figure GC.23-1).

Figure GC.23-1: Woodbury City (Gloucester County) Location Map

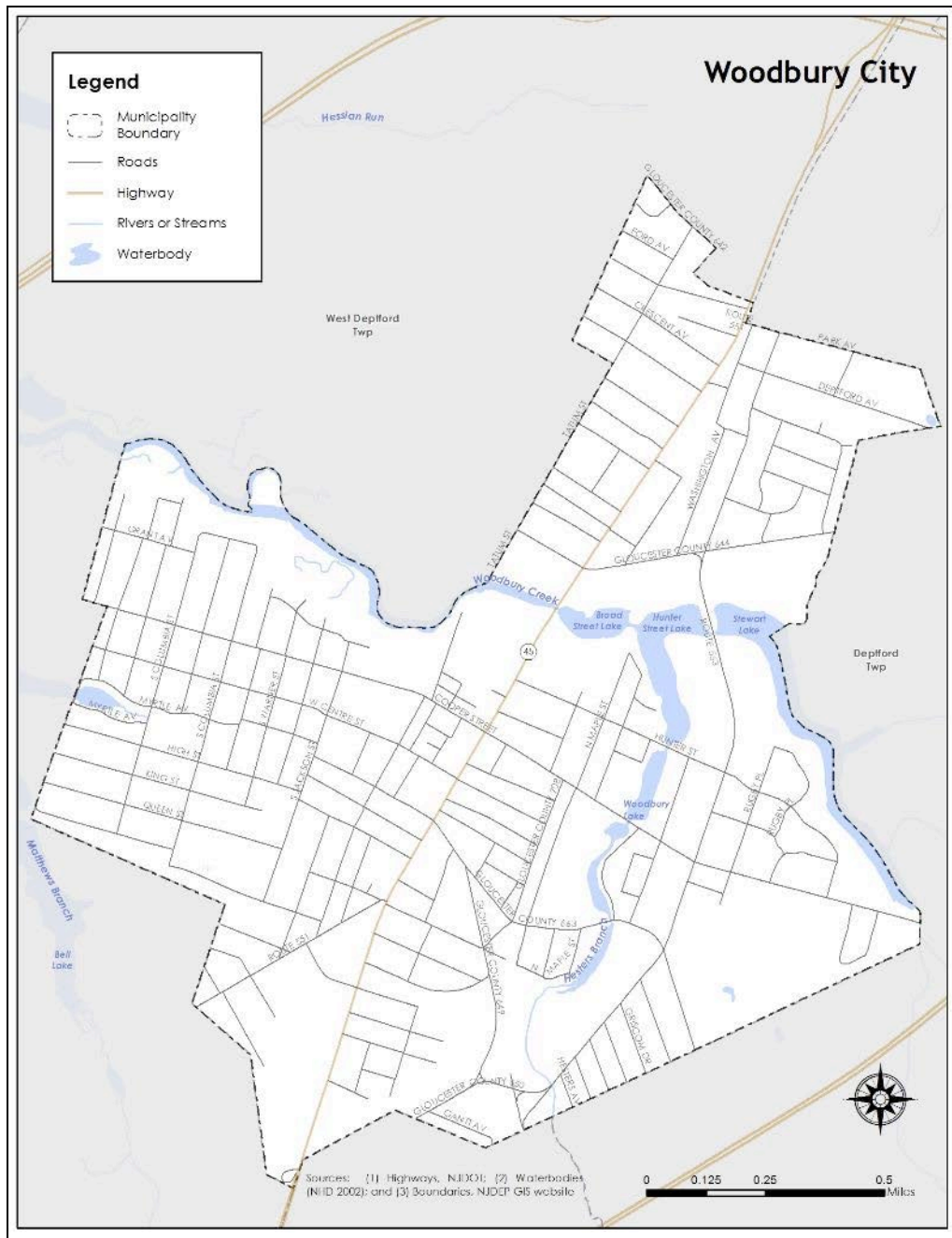


Part 3: Hazard Identification and Risk Assessment

Woodbury City is a growing community with a history dating back to shortly before the Revolutionary War. With a population of close to 8,000 people and as the Gloucester County seat, Woodbury City continues to develop commercial and retail areas. In order to support the City's workforce, plans are in place for the development of a light rail system to complement an already existing bus hub. A commercial railroad also runs through the City.

Per Figure GC.23-2, the major water courses include Woodbury Creek and Hesters Branch. Major transportation routes include State Highway 45 and Gloucester County Route 644. The land is predominantly flat.

Figure GC.23-2: Woodbury City Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.23-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.23-3: Woodbury City Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Woodbury City	Gloucester County	Region	New Jersey
2000 Population	10,307	254,673	974,328	8,414,350
2010 Population	10,174	288,288	1,024,926	8,791,894
Percent Change	-1.29%	13.2%	5.19%	4.49%
Population Density	5,061.7 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	2.01 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	23.5	24.4	24.1	23.5
% of Population 18 - 64	62.5	63.2	62.7	63
% of Population 65 and over	14.0	12.4	13.2	13.5

Table GC.23-4 illustrates how Woodbury City ranks in the county, the four county region, and New Jersey.

Table GC.23-4: Woodbury City Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	10	28	241
Land Area Rank	18	59	392
Population Density Rank	1	11	110
Population Change Rank	18	61	-

Table GC.23-5 includes information related to economic and housing statistics for Woodbury City, Gloucester County, the four county region, and New Jersey.

Table GC.23-5: Woodbury City Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Woodbury City	Gloucester County	Region	New Jersey
Date Incorporated	January 2, 1871	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$58,629	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	4,456	109,796	397,990	3,529,033
Occupied Housing Units	4,088	104,271	372,472	3,176,069
Vacant Housing Units	368	5,525	25,518	352,964
Owner Occupied Housing Units	2,379	83,525	266,593	2,126,279
Renter occupied Housing Units	1,709	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Woodbury City	Gloucester County	Region	New Jersey
Building Permits	0	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

A major employer in the municipality is Underwood Memorial Hospital.

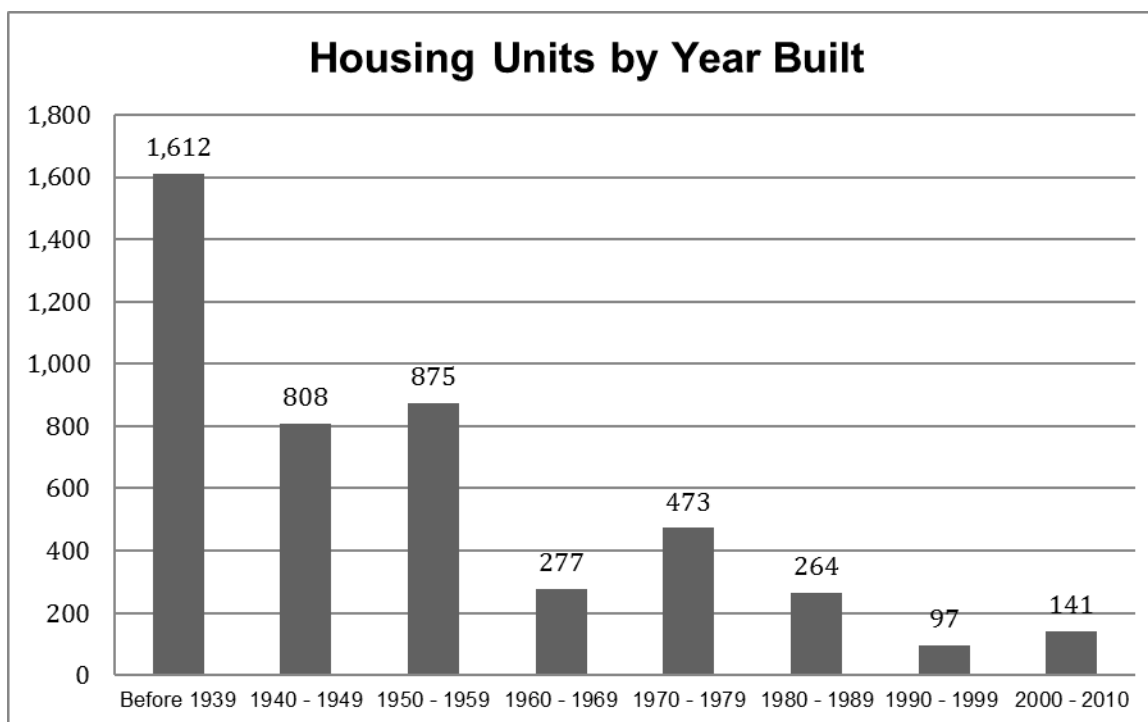
Table GC.23-6 illustrates how Woodbury City ranks in the county and the four county region.

Table GC.23-6: Woodbury City Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	21	57
Vacant Housing Rank	6	21
Renter Occupied Housing Rank	6	13
Building Permits	24	87

Figure GC.23-3 illustrates development patterns in Woodbury City by examining housing units by year built. About 36% of homes in Woodbury City were built prior to 1939.

Figure GC.23-3: Woodbury City Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- High Wind

Moderate Priority

- Extreme Temperature: Cold & Hot
- Flood
- Severe Weather – Summer
- Severe Weather – Winter

Low Priority

- Dam Failure
- Drought
- Earthquake
- Levee Failure

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Wildfire

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3: Hazard Identification and Risk Assessment

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.23-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.23-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge)	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where inundation due to storm surge may occur
Table RP.D-81	Levee Failure	Levee Inventory	Provide information about levee configuration
Figure RP.D-85	Levee Failure	Levee Locations	Identify locations of levees in and around the municipality

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.23-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.23-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Winds
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.23-8: Woodbury City (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	City Hall	Municipal	Administrative Offices	33 Delaware Street, Woodbury	CF-2	N	Y		M-5 / M-17
CF-2	Emergency Operations Center	EOC	Co-located Facilities	33 Delaware Street, Woodbury	CF-1	N	Y		
CF-3	Woodbury Police Station	Law Enforcement Facilities	Stations	200 North Broad Street, Woodbury		N	Y	Includes holding cell	
CF-4	Woodbury Police Station ²	Law Enforcement Facilities	Stations	220 South Broad Street, Woodbury		N	Y		
CF-6	Woodbury Fire Department	FireStation	Stations	29 Delaware Street, Woodbury		N	Y ³		M-6
CF-7	Inspira Hospital Paramedics	EMS	Private Stations	238 South Evergreen Avenue, Woodbury		N	N ⁴		
CF-8	Public Works	Public Works	Administrative Offices	630 South Evergreen Avenue, Woodbury		N	Y		
CF-9	Public Works Garage	Public Works	Maintenance / Work Areas	633 South Evergreen Avenue, Woodbury		N	N		M-7
CF-10	Water Treatment Plant	Utilities – Water	Treatment Plants	317 East Red Bank Avenue, Woodbury		N/A	Y		
CF-11	Pump Station	Utilities – Water	Pump Stations	Laurel Avenue & Hunter Street, Woodbury		N/A	Y		
CF-12	Well #1	Utilities – Water	Water Towers	1800 Glassboro Road, Woodbury	CF-13	N/A	N		M-8
CF-13	Well #2	Utilities – Water	Water Towers	1800 Glassboro Road, Woodbury	CF-12	N/A	N		M-9
CF-14	Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	Laurel Avenue & Hunter Street, Woodbury		N/A	N		M-10

² Construction is scheduled to commence January / February 2015.

³ Back-up generator provides partial building coverage for emergency lighting.

⁴ Facility has a portable back-up generator hook-up.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-15	Evergreen Avenue Elementary School	Schools	Public Schools	160 North Evergreen Avenue, Woodbury		Y ⁵	N		M-11
CF-16	Walnut Street Elementary School	Schools	Public Schools	60 Walnut Street, Woodbury		Y	N		M-12
CF-17	West End Memorial Elementary School	Schools	Public Schools	215 Queen Street, Woodbury		Y	N		M-13
CF-18	Woodbury Junior-Senior High School	Schools	Public Schools	25 North Broad Street, Woodbury		Y	Y		
CF-19	Durand Academy and Community Services, Inc.	Schools	Private Schools	230 North Evergreen Avenue, Woodbury		N	N		
CF-20	Tra-Cee Nursery School	Schools	Private Schools	77 Oak Street, Woodbury		N	N		
CF-21	YMCA	Emergency Staging Areas	Evacuation	235 East Red Bank Avenue, Woodbury		Y	Y		
CF-22	Holy Angels Parish	Emergency Staging Areas	Evacuation	64 Cooper Street, Woodbury		Y	N		M-14
CF-23	Inspira Medical Center - Woodbury	Health Care Facilities	Private Hospitals	509 North Broad Street, Woodbury		N ⁶	Y		
CF-24	Woodbury Mews Assisted Living	Vulnerable Populations Facilities	Private Assisted Living	124 Green Avenue, Woodbury		Y ⁶	Y		
CF-25	Woodbury Mews – Senior Living & Memory Center	Vulnerable Populations Facilities	Private Assisted Living	122 Green Avenue, Woodbury		Y ⁶	Y		

⁵ Shelter of last resort.

⁶ Shelter in place.

Part 3: Hazard Identification and Risk Assessment

Table GC.23-9: Woodbury City (Gloucester County) Critical Facilities Hazard Exposure⁷

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	City Hall	N/A	N/A	N/A		N/A								N/A	N/A
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A								N/A	N/A
CF-3	Woodbury Police Station	N/A	N/A	N/A		N/A								N/A	N/A
CF-4	Woodbury Police Station ⁸	N/A	N/A	N/A		N/A								N/A	N/A
CF-6	Woodbury Fire Department	N/A	N/A	N/A		N/A								N/A	N/A
CF-7	Inspira Hospital Paramedics	N/A	N/A	N/A		N/A								N/A	N/A
CF-8	Public Works	N/A	N/A	N/A		N/A								N/A	N/A
CF-9	Public Works Garage	N/A	N/A	N/A		N/A								N/A	N/A
CF-10	Water Treatment Plant	N/A	N/A	N/A		N/A								N/A	N/A
CF-11	Pump Station	N/A	N/A	N/A		N/A								N/A	N/A
CF-12	Well #1	N/A	N/A	N/A		N/A								N/A	N/A
CF-13	Well #2	N/A	N/A	N/A		N/A								N/A	N/A
CF-14	Pump Station	N/A	N/A	N/A		N/A								N/A	N/A
CF-15	Evergreen Avenue Elementary School	N/A	N/A	N/A		N/A								N/A	N/A
CF-16	Walnut Street Elementary School	N/A	N/A	N/A		N/A								N/A	N/A
CF-17	West End Memorial Elementary School	N/A	N/A	N/A		N/A								N/A	N/A
CF-18	Woodbury Junior-Senior High School	N/A	N/A	N/A		N/A								N/A	N/A

⁷ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

⁸ Construction is scheduled to commence January / February 2015.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-19	Durand Academy and Community Services, Inc.	N/A	N/A	N/A		N/A								N/A	N/A
CF-20	Tra-Cee Nursery School	N/A	N/A	N/A		N/A								N/A	N/A
CF-21	YMCA	N/A	N/A	N/A		N/A								N/A	N/A
CF-22	Holy Angels Parish	N/A	N/A	N/A		N/A								N/A	N/A
CF-23	Inspira Medical Center - Woodbury	N/A	N/A	N/A		N/A								N/A	N/A
CF-24	Woodbury Mews Assisted Living	N/A	N/A	N/A		N/A								N/A	N/A
CF-25	Woodbury Mews – Senior Living & Memory Center	N/A	N/A	N/A		N/A								N/A	N/A

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.23-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.23-10.

Table GC.23-10: Status of Woodbury City (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Woodbury 1: Engineering study to determine appropriate flood mitigation action for EOC/data storage (City Hall) located at 33 Delaware Street.	Not completed, not funded	Mitigation measure is include in updated Municipal Appendix.	M-17
Woodbury 2: Engineering study to determine appropriate flood mitigation action and envelope hardening of Colonial Park Senior Citizen Center located at 401 S. Evergreen Street.	Not completed, not funded	Multi-jurisdictional mitigation measure is include in updated Municipal Appendix.	MJ-3
Woodbury 3: Engineering study to determine appropriate flood mitigation action on the following streets: East Red Bank Avenue, S. Evergreen Avenue, S. Barbara Avenue, Packard Avenue between Logan and S. Columbia Street, Delaware Street, Drexel Street, Child Street, Gerard Street between Salem Avenue and Glover Street.	Not completed, not funded	Revised mitigation measure is include in updated Municipal Appendix.	M-20
Woodbury 4: Elevation of residences on Packard Avenue.	Not completed, not funded	Revised mitigation measure is include in updated Municipal Appendix.	M-18

Table GC.23-10 Notes:

- A. See Tables GC.23-11 and GC.23-12 for municipal (M-#) mitigation measures
- B. See Table GC.23-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.23-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Note: Woodbury City does not currently have RL or SRL properties per information provided by the New Jersey Department of Environmental Protection.

Table GC.23-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.23-4.

Table GC.23-11: Woodbury City (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.²	All	Goal #1	Both
M-2	Prioritize critical facilities and historic / cultural resources and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #2	Existing

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-5	Upgrade permanent back-up emergency power generator at City Hall (CF-1).	All	Goal #4	Both
M-6	Upgrade permanent back-up emergency power generator at Woodbury Fire Department (CF-6).	All	Goal #4	Both
M-7	Install permanent back-up emergency power generator at Public Works Fleet Maintenance (CF-9).	All	Goal #4	Both
M-8	Install permanent back-up emergency power generator at Well #1 (CF-12).	All	Goal #4	Both
M-9	Install permanent back-up emergency power generator at Well #2 (CF-13).	All	Goal #4	Both
M-10	Install permanent back-up emergency power generator at Pump Station (CF-14).	All	Goal #4	Both
M-11	Install permanent back-up emergency power generator at Evergreen Avenue Elementary School (CF-15).	All	Goal #4	Both
M-12	Install permanent back-up emergency power generator at Walnut Street Elementary School (CF-16).	All	Goal #4	Both
M-13	Install permanent back-up emergency power generator at West End Memorial Elementary School (CF-17).	All	Goal #4	Both
M-14	Install permanent back-up emergency power generator at Holy Angels Parish (shelter) (CF-22).	All	Goal #4	Both
M-15	Upgrade dam flood gates for Stewart Lake Dam.	Dam Failure	Goal #4	Both
M-16	Upgrade dam flood gates for Cooper Street Dam.	Dam Failure	Goal #4	Both
M-17	Engineering study to determine appropriate flood mitigation action for EOC / data storage at City Hall facility located at 33 Delaware Street (CF-1).	Flood	Goal #4	Both
M-18	Upgrade storm management system at Packard Avenue.	Flood	Goal #4	Both
M-19	Upgrade storm management system at Stewart Avenue.	Flood	Goal #4	Both
M-20	Engineering study to determine appropriate flood mitigation action on the following streets: East Red Bank Avenue, S. Evergreen Avenue, S. Barber Avenue, Packard Avenue between Logan and S. Columbia Street, Delaware Street, Drexel Street, Child Street, Gerard Street between Salem Avenue and Glover Street, Cooper Street at Almonesson Lake.	Flood	Goal #4	Existing

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.23-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria³
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁴
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.23-12: Woodbury City (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	High	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Low	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.

³ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Upgrade permanent back-up emergency power generator at City Hall (CF-1).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Upgrade permanent back-up emergency power generator at Woodbury Fire Department (CF-6).	Municipal OEM, Public Works Department, and Fire Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-7	Install permanent back-up emergency power generator at Public Works Fleet Maintenance (CF-9).	Municipal OEM and Public Works Department	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-8	Install permanent back-up emergency power generator at Well #1A (CF-12).	Municipal OEM and Public Works Department	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-9	Install permanent back-up emergency power generator at Well #2A (CF-13).	Municipal OEM and Public Works Department	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-10	Install permanent back-up emergency power generator at Pump Station (CF-14).	Municipal OEM and Public Works Department	Moderate	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-11	Install permanent back-up emergency power generator at Evergreen Avenue Elementary School (CF-24).	Municipal OEM Public Works Department, and School Board	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-12	Install permanent back-up emergency power generator at Walnut Street Elementary School (CF-25).	Municipal OEM Public Works Department, and School Board	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-13	Install permanent back-up emergency power generator at West End Memorial Elementary School (CF-26).	Municipal OEM Public Works Department, and School Board	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-14	Install permanent back-up emergency power generator at Holy Angels Parish (shelter) (CF-31).	Municipal OEM Public Works Department, and Holy Angels Parish	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-15	Upgrade dam flood gates for Woodbury Creek Park Dam.	Municipal OEM and Public Works Department	Low	Public Property Mitigation	\$100K - \$500K	Three to five years	Conduct project scoping.
M-16	Upgrade dam flood gates for Bell Lake Dam.	Municipal OEM and Public Works Department	Low	Public Property Mitigation	\$100K - \$500K	Three to five years	Conduct project scoping.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-17	Engineering study to determine appropriate flood mitigation action for EOC / data storage at City Hall facility located at 33 Delaware Street (CF-1).	Municipal OEM and Public Works Department	Moderate	Public Property Flood Mitigation	< \$50K	One to three years	Develop scope of work for engineering study and procure professional consulting services.
M-18	Upgrade storm management system at Packard Avenue.	Municipal OEM and Public Works Department	Low	Private Property Flood Mitigation	< \$100K	Three to five years	Conduct project scoping.
M-19	Upgrade storm management system at Stewart Avenue.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	< \$100K	One to three years	Conduct project scoping.
M-20	Engineering study to determine appropriate flood mitigation action on the following streets: East Red Bank Avenue, S. Evergreen Avenue, S. Barber Avenue, Packard Avenue between Logan and S. Columbia Street, Delaware Street, Drexel Street, Child Street, Gerard Street between Salem Avenue and Glover Street, Cooper Street at Almonesson Lake.	Municipal OEM and Public Works Department	Moderate	Private Property Flood Mitigation	< \$50K	One to three years	Develop scope of work for engineering study and procure professional consulting services.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.23-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

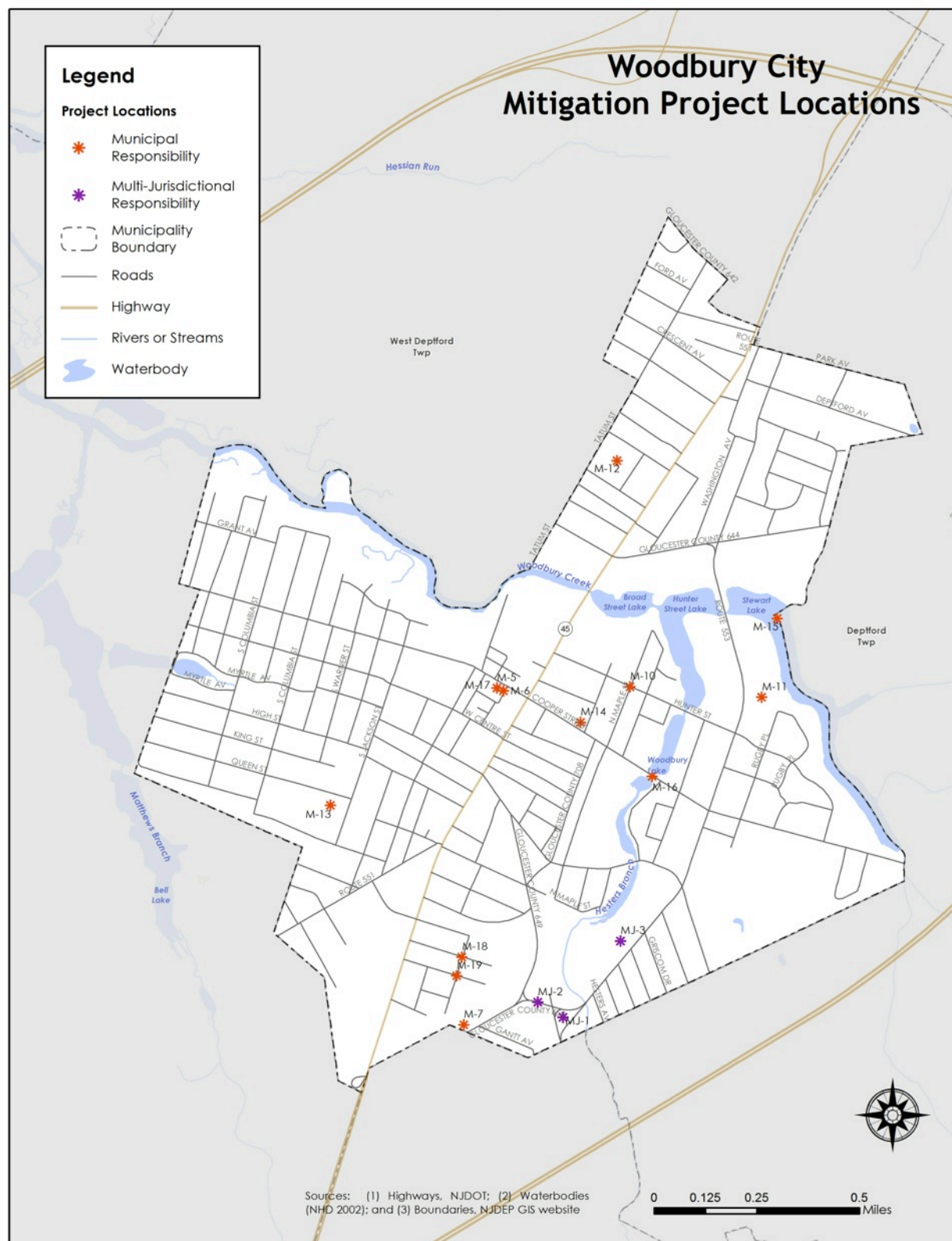
Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.23-4.

Table GC.23-13: Woodbury City (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Storm sewer system at Evergreen Circle and County Route 650.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	High
MJ-2	Improve storm water management system at Conrail railroad and South Evergreen Avenue.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW, Conrail	Low
MJ-3	Alleviate flooding and hardening of Colonial Park Senior Citizen Center.	Flood / High Wind / Severe Weather - Winter	Goal #4	Both	Municipal OEM, Gloucester County DPW	Low

Part 4: Mitigation Measures

Figure GC.23-4: Woodbury City Mitigation Project Locations



Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan – Base Plan (2014)
- Comprehensive Master Plan (2006)⁵
- Flood Damage Prevention⁶
- Stormwater Control Ordinance⁷
- Zoning Ordinance⁸
- Broad Street Business District Redevelopment Plan (2010)⁹
- Capital Improvement Budget (2014)¹⁰

⁵ <http://www.woodbury.nj.us/city-government/woodbury-master-plan/>

⁶ <http://ecode360.com/11413465#11413465>

⁷ <http://ecode360.com/11414523?highlight=stormwater#11414523>

⁸ <http://ecode360.com/11415944#11415944>

⁹ http://www.woodbury.nj.us/wp-content/uploads/2011/05/03-08-10_Redev_Exec_Summ.pdf

¹⁰ <http://www.woodbury.nj.us/city-government/municipal-information/municipal-budget/>

Attachment A: Public Review Comments

The following comments were received during the public review of the Woodbury City Municipal Appendix:

Table GC.23.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of May 29, 2015, no public review comments were received for the Woodbury City Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.24
Woodbury Heights Borough, New Jersey

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.24-i
Part 1 Overview	GC.24-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.24-1
1.2: Woodbury Heights Borough (Gloucester County) Municipal Appendix	GC.24-1
Part 2 Participation	GC.24-2
2.1: Municipal Working Group Participation	GC.24-2
2.2: Public Participation	GC.24-4
Part 3 Hazard Identification and Risk Assessment	GC.24-5
3.1: Municipal Profile	GC.24-5
3.2: Hazard Priorities	GC.24-9
3.3: Hazard Mapping	GC.24-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.24-11
Part 4 Mitigation Measures	GC.24-16
4.1: Mitigation Goals and Strategy	GC.24-16
4.2: SDVR HMP Mitigation Measures	GC.24-17
4.3: Municipal Mitigation Measures – Identification	GC.24-18
4.4: Municipal Mitigation Measures – Implementation	GC.24-20
4.5: Multi-Jurisdictional Mitigation Measures	GC.24-23
4.6: Plan Review and Integration	GC.24-25

Table of Contents

List of Figures

Figure GC.24-1: Woodbury Heights Borough (Gloucester County) Location Map	GC.24-5
Figure GC.24-2: Woodbury Heights Borough Base Map	GC.24-6
Figure GC.24-3: Woodbury Heights Borough Housing Units by Year Built	GC.24-8
Figure GC.24-4: Woodbury Heights Borough Mitigation Project Locations	GC.24-24

List of Tables

Table GC.24-1: Woodbury Heights Borough (Gloucester County) Working Group	GC.24-2
Table GC.24-2: Public Participation	GC.24-4
Table GC.24-3: Woodbury Heights Borough Demographics	GC.24-7
Table GC.24-4: Woodbury Heights Borough Demographic Rankings	GC.24-7
Table GC.24-5: Woodbury Heights Borough Economics and Housing	GC.24-7
Table GC.24-6: Woodbury Heights Borough Ranking (Economics and Housing)	GC.24-8
Table GC.24-7: Supporting Mapping and Exhibits	GC.24-10
Table GC.24-8: Woodbury Heights Borough Critical Facilities Inventory	GC.24-12
Table GC.24-9: Woodbury Heights Borough Critical Facilities Hazard Exposure	GC.24-14
Table GC.24-10: Status of Woodbury Heights Borough SDVR HMP Mitigation Measures	GC.24-17
Table GC.24-11: Woodbury Heights Borough Municipal Mitigation Measures Identification	GC.24-18
Table GC.24-12: Woodbury Heights Borough Municipal Mitigation Measures Implementation	GC.24-20
Table GC.24-13: Woodbury Heights Borough Multi-Jurisdictional Mitigation Measures	GC.24-23

Attachments

Attachment GC.24.A: Public Review Comments	GC.24.A-1
Attachment GC.24.B: Adoption Resolution	GC.24.B-1
Attachment GC.24.C: Approval Letter	GC.24.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Woodbury Heights Borough (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Woodbury Heights Borough in Gloucester County, New Jersey.

The Woodbury Heights Borough Municipal Working Group recommended the Woodbury Heights Borough (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Woodbury Heights Borough Council adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.24-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.24-1: Woodbury Heights Borough (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Contribution ³
Robbie	Conley	Woodbury Heights OEM / Planning Board	Emergency Management Coordinator / Planning Board Member	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Ronald	Tomasetti	Woodbury Heights OEM	Deputy OEM Coordinator		<input checked="" type="checkbox"/>	
Christian	Romano	Woodbury Heights Construction Office	Construction Official / Floodplain Administrator		<input checked="" type="checkbox"/>	
Mark	Bruermer	Woodbury Heights Engineering / Planning Board	Borough Engineer / Planning Board Member	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Richard	Middleton	Woodbury Heights Public Works	Public Works Manager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Gary R.	Krohn	Woodbury Heights Police Department	Investigator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Thomas	Radcliff Jr.	Woodbury Heights Fire Department	Fire Captain	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on October 8, 2014.

² Round 2 Work Session was held on October 29, 2014.

³ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.24-1.

Part 2: Participation

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁴

- Elected Officials
- Community / Faith-Based Organizations
- Environmental Organizations
- Healthcare Institutions
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Business Associations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Major Employers and Businesses

⁴ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.24-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.24-2: Public Participation

Date	Type of Involvement	Location
October 14, 2014	Link to Project Website (http://nj4hmp.com) established	Borough of Woodbury Heights ⁵
November, 2014	Flyers posted	Borough Hall Firehouse and select local businesses
November 24, 2014	Information item included on Woodbury Heights Borough Committee agenda identifying opportunities for public participation	Woodbury Heights Borough Hall
December 6, 2014	Public outreach	Borough Tree Lighting
December 17, 2014	Public hearing included on Woodbury Heights Borough Committee agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Woodbury Heights Borough Hall
December 19, 2014	Preliminary Municipal Appendix posted to website for public comment	Borough of Woodbury Heights ⁵
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁶ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁷

⁵ <http://www.bwhnj.com/>

⁶ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁷ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

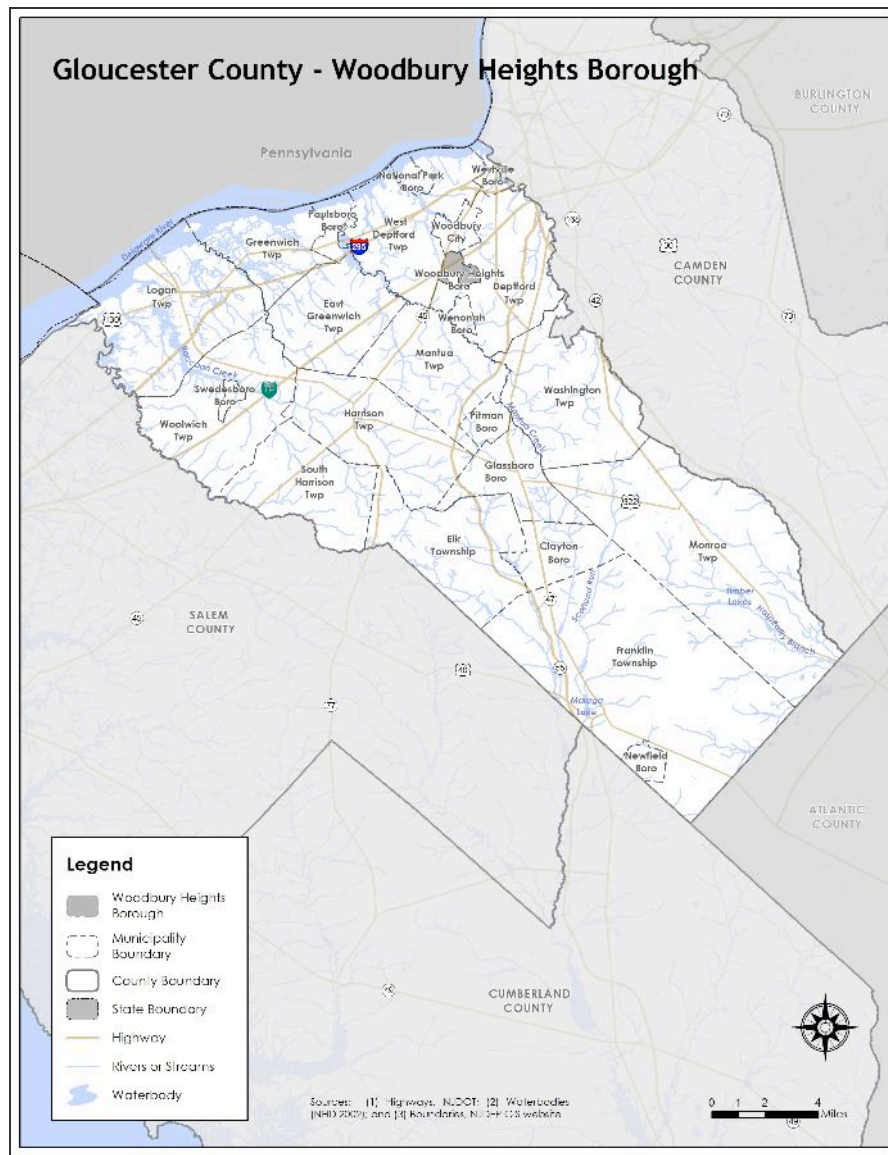
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Woodbury Heights Borough is located in the northeastern part of Gloucester County (See Figure GC.24-1).

Figure GC.24-1: Woodbury Heights Borough (Gloucester County) Location Map

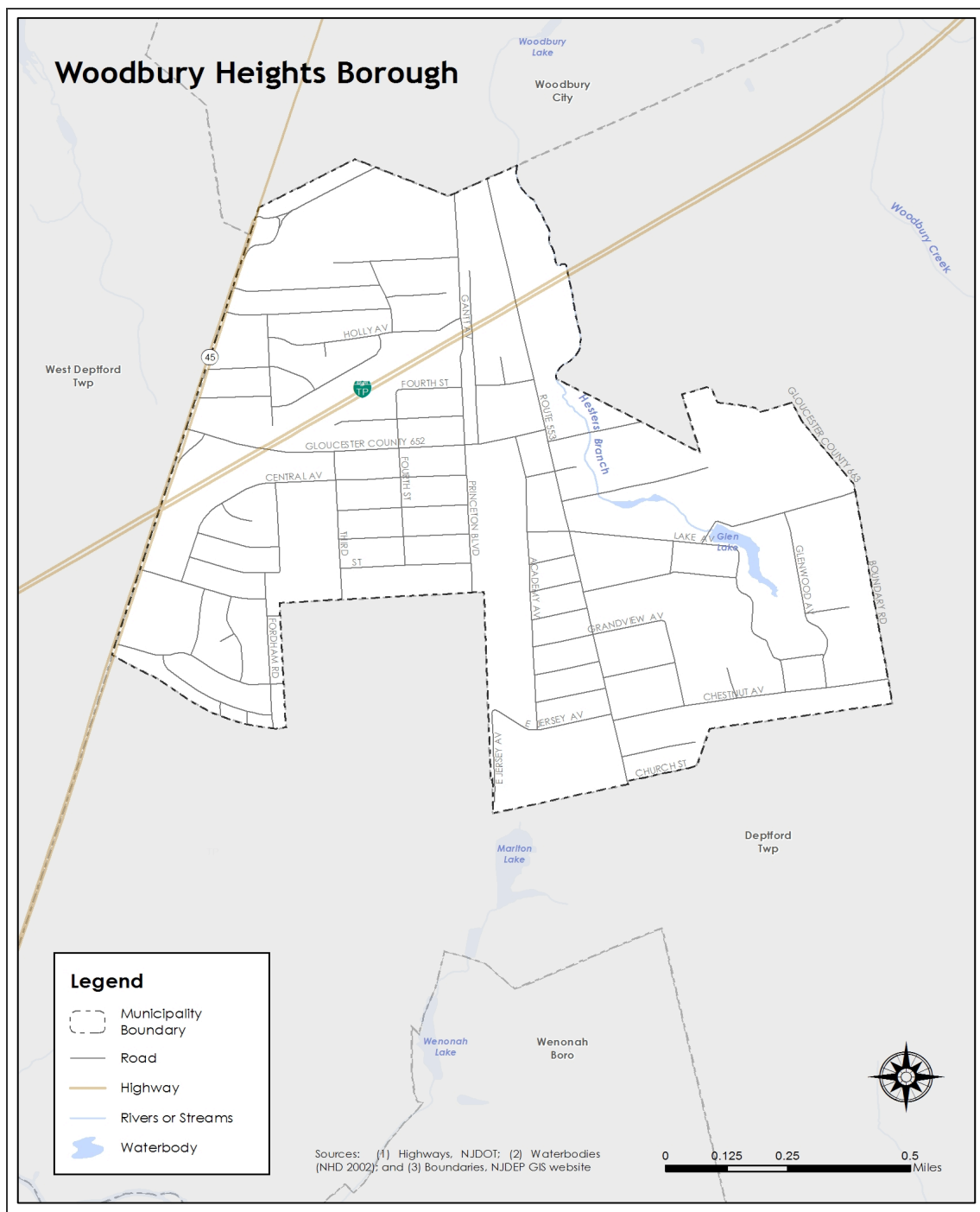


Part 3: Hazard Identification and Risk Assessment

Woodbury Heights Borough is a small rural community in Gloucester County.

Per Figure GC.24-2, the major water courses include Hesters Branch and Glen Lake. Major transportation routes include the New Jersey Turnpike and State Highway 45, Gloucester County Route 553, and municipal road Elm Avenue. Additionally, a Conrail commercial railroad line runs through the Borough. The land is predominantly flat.

Figure GC.24-2: Woodbury Heights Borough Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.24-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.24-3: Woodbury Heights Borough Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Woodbury Heights Borough	Gloucester County	Region	New Jersey
2000 Population	2,988	254,673	974,328	8,414,350
2010 Population	3,055	288,288	1,024,926	8,791,894
Percent Change	2.24%	13.2%	5.19%	4.49%
Population Density	2,499.4 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	1.22 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	22.6	24.4	24.1	23.5
% of Population 18 - 64	63.8	63.2	62.7	63
% of Population 65 and over	13.6	12.4	13.2	13.5

Table GC.24-4 illustrates how Woodbury Heights Borough ranks in the county, the four county region, and New Jersey.

Table GC.24-4: Woodbury Heights Borough Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	20	66	448
Land Area Rank	17	72	463
Population Density Rank	7	37	251
Population Change Rank	14	37	-

Table GC.24-5 includes information related to economic and housing statistics for Woodbury Heights Borough, Gloucester County, the four county region, and New Jersey.

Table GC.24-5: Woodbury Heights Borough Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Woodbury Heights Borough	Gloucester County	Region	New Jersey
Date Incorporated	April 27, 1915	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$82,411	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	1,125	109,796	397,990	3,529,033
Occupied Housing Units	1,081	104,271	372,472	3,176,069
Vacant Housing Units	44	5,525	25,518	352,964
Owner Occupied Housing Units	985	83,525	266,593	2,126,279

Part 3: Hazard Identification and Risk Assessment

	Woodbury Heights Borough	Gloucester County	Region	New Jersey
Renter Occupied Housing Units	96	20,746	105,879	1,049,790
Building Permits	0	716	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

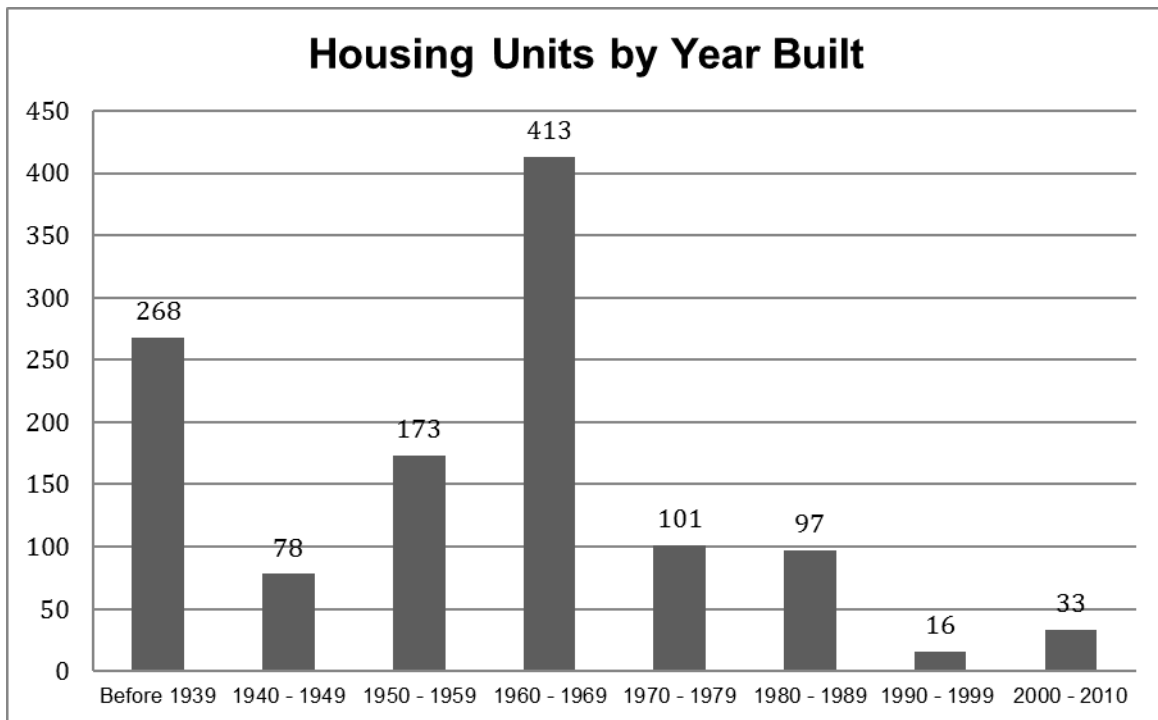
Table GC.24-6 illustrates how Woodbury Heights Borough ranks in the county and the four county region.

Table GC.24-6: Woodbury Heights Borough Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	7	13
Vacant Housing Rank	22	78
Renter Occupied Housing Rank	22	78
Building Permits	24	87

Figure GC.24-3 illustrates development patterns in Woodbury Heights Borough by examining housing units by year built. About 37% of homes in Woodbury Heights Borough were built during the 1960s.

Figure GC.24-3: Woodbury Heights Borough Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- None

Moderate Priority

- Flood
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Low Priority

- Dam Failure
- Drought
- Earthquake
- Extreme Temperature: Cold & Hot
- Wildfire

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Levee Failure

¹ See *Section 3: Hazard Identification and Risk Assessment*.

Part 3: Hazard Identification and Risk Assessment

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.24-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.24-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.24-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.24-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.24-8: Woodbury Heights Borough (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Borough Hall	Municipal	Administrative Offices	500 Elm Avenue, Woodbury Heights		N	N	Alternate EOC	M-5
CF-2	Emergency Operations Center	EOC	Co-located Facilities	534 Elm Avenue, Woodbury Heights	CF-4	N	N		
CF-3	Woodbury Heights Police Department	Law Enforcement Facilities	Stations	520 Elm Avenue, Woodbury Heights		N	Y	Includes a holding cell	M-22
CF-4	Woodbury Heights Improvement, Protective & Fire Association	FireStation / EMS	Stations	534 Elm Avenue, Woodbury Heights	CF-2	N	N		M-6
CF-5	Public Works	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	430 Glassboro Road, Woodbury Heights		N	Y ²		M-7 / M-21
CF-6	Wellhead	Utilities – Water	Wellhead	730 Helen Avenue, Woodbury Heights		N/A	Y		
CF-7	Water Tower	Utilities – Water	Water Towers	Grandview Avenue, Woodbury Heights		N/A	N		
CF-8	Candidus Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	736 Candidas Avenue, Woodbury Heights		N/A	Y ²		M-8
CF-9	Central Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	153 Central Avenue, Woodbury Heights		N/A	Y ²		M-9
CF-10	Chestnut Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	318 Chestnut Avenue, Woodbury Heights		N/A	Y ²		M-10
CF-11	Glenwood Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	295 Glenwood Avenue, Woodbury Heights		N/A	Y ²		
CF-12	Helen Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	717 Helen Avenue, Woodbury Heights		N/A	Y ²		M-11

² Portable back-up generator hook-up and portable back-up generator available to critical facility.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-13	Route 45 Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	834 Mantua Pike, Woodbury Heights		N/A	Y ²		M-12
CF-14	Woodland Avenue Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	1240 Gassboro Road, Woodbury Heights		N/A	Y ²		M-13
CF-15	Woodbury Heights Elementary School	Schools	Public Schools	100 Academy Avenue, Woodbury Heights		N	N		
CF-16	Gateway Regional High School	Schools	Public Schools	775 Tanyard Road, Woodbury Heights		Y ³	Y ⁴		M-14
CF-17	Saint Margaret School	Schools	Private Schools	773 Third Street, Woodbury Heights		N	N		
CF-18	Beech House ⁵	Vulnerable Populations Facilities	Assisted Living	300 Beech Avenue, Woodbury Heights		N	N		
CF-19	Lincoln House ⁵	Vulnerable Populations Facilities	Assisted Living	395 Lincoln Avenue, Woodbury Heights		N	N		
CF-20	Woodbury Heights Community Center	Municipal – Other	Community Center	741 Helen Avenue, Woodbury Heights		Y	N	Alternate EOC	M-15

³ Shelter of last resort.

⁴ Back-up generator provides partial building coverage for emergency lighting.

⁵ Shelter in place.

Part 3: Hazard Identification and Risk Assessment

Table GC.24-9: Woodbury Heights Borough (Gloucester County) Critical Facilities Hazard Exposure⁶

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Borough Hall	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-3	Woodbury Heights Police Department	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-4	Woodbury Heights Improvement, Protective & Fire Association	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-5	Public Works	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-6	Wellhead	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-7	Water Tower	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-8	Candidus Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-9	Central Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-10	Chestnut Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-11	Glenwood Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-12	Helen Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-13	Route 45 Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-14	Woodland Avenue Pump Station	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-15	Woodbury Heights Elementary School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-16	Gateway Regional High School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

⁶ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-17	Saint Margaret School	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-18	Beech House	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-19	Lincoln House	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		
CF-20	Woodbury Heights Community Center	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A	N/A		

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.24-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.24-10.

Table GC.24-10: Status of Woodbury Heights Borough (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Woodbury Heights 1: Install under-drains in Summit Section of Woodbury Heights (Alliance Street between Fordham Road and Central Avenue; sections of Auburn Street and Fordham Road) connecting to the storm sewer; new drainage would drop the groundwater level below the sanitary sewer system to avoid infiltration .	Work-in-progress, additional funding needed	Woodbury Heights Borough completed an infiltration study funded through the capital improvement budget. Woodbury Heights Borough Public Works Department has done some work in mitigating this issue, but the issue requires additional work. Therefore, mitigation measure is included in update Municipal Appendix.	M-17
Woodbury Heights 2: System redundancy and hazard threat recognition of water/sewage facility/pipes.	Not completed, not funded	Issue is not considered valid. Therefore, mitigation measure is not included in updated Municipal Appendix.	N/A
Woodbury Heights 3: System redundancy of water facility (town well) located on Helen Avenue (water tank is on Grand View Street).	Not completed, not funded	Mitigation measure is included in updated Municipal Appendix.	M-16
Woodbury Heights 4: Back-up generator for EOC (municipality building).	Not completed, not funded	Revised mitigation measure is included in updated Municipal Appendix.	M-5

Table GC.24-10 Notes:

- A. See Tables GC.24-11 and GC.24-12 for municipal (M-#) mitigation measures
- B. See Table GC.24-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.24-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Note: Woodbury Heights Borough does not currently have RL or SRL properties per information provided by the New Jersey Department of Environmental Protection.

Table GC.24-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.24-4.

Table GC.24-11: Woodbury Heights Borough (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.²	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Flood	Goal #2	Existing

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-5	Install permanent backup emergency power generator for Borough Hall / EOC (CF-1).	All	Goal #4	Both
M-6	Upgrade permanent backup emergency power generator for Fire Station / EMS (CF-4).	All	Goal #4	Both
M-7	Upgrade permanent backup emergency power generator for Public Works facility (CF-5).	All	Goal #4	Both
M-8	Install permanent backup emergency power generator for Candidus Avenue pump station (CF-8).	All	Goal #4	Both
M-9	Install permanent backup emergency power generator for Central Avenue pump station (CF-9).	All	Goal #4	Both
M-10	Install permanent backup emergency power generator for Chestnut Avenue pump station (CF-10).	All	Goal #4	Both
M-11	Install permanent backup emergency power generator for Helen Avenue pump station (CF-12).	All	Goal #4	Both
M-12	Install permanent backup emergency power generator for Route 45 pump station (CF-13).	All	Goal #4	Both
M-13	Install permanent backup emergency power generator for Woodland Avenue pump station (CF-14).	All	Goal #4	Both
M-14	Install permanent backup emergency power generator for Gateway Regional High School (CF-16).	All	Goal #4	Both
M-15	Install permanent backup emergency power generator for Community Center (CF-20).	All	Goal #4	Both
M-16	System redundancy of water facility (town well) located on Helen Avenue (water tank is on Grand View Street).	All	Goal #4	Both
M-17	Install under-drains in Summit Section of Woodbury Heights (Alliance Street between Fordham Road and Central Avenue; sections of Auburn Street and Fordham Road) connecting to the storm sewer; new drainage would drop the groundwater level below the sanitary sewer system to avoid infiltration .	Flood	Goal #4	Both
M-18	Upgrade stormwater collection capacity on Alliance Street.	Flood	Goal #4	Both
M-19	Upgrade storm collection system on Grandview Avenue through Fairview Avenue.	Flood	Goal #4	Both
M-20	Dredge Glen Lake to improved storm water collection.	Flood	Goal #4	Both
M-21	Floodproof / retrofit & harden Public Works Department Facility (CF-5).	Flood / High Wind	Goal #4	Both
M-22	Retrofit / harden Police Department building (CF-3).	High Wind	Goal #4	Both

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.24-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria³
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁴
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

Table GC.24-12: Woodbury Heights Borough (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM	Low	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Moderate	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	High	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.

³ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Install permanent backup emergency power generator for Borough Hall / EOC (CF-1).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-6	Upgrade permanent backup emergency power generator for Fire Station / EMS (CF-4).	Municipal OEM, Public Works Department, Fire Department / EMS	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-7	Upgrade permanent backup emergency power generator for Public Works facility (CF-5).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-8	Install permanent backup emergency power generator for Candidus Avenue pump station (CF-8).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-9	Install permanent backup emergency power generator for Central Avenue pump station (CF-9).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-10	Install permanent backup emergency power generator for Chestnut Avenue pump station (CF-10).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	Conduct project scoping.
M-11	Install permanent backup emergency power generator for Helen Avenue pump station (CF-12).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-12	Install permanent backup emergency power generator for Route 45 pump station (CF-13).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-13	Install permanent backup emergency power generator for Woodland Avenue pump station (CF-14).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-14	Install permanent backup emergency power generator for Gateway Regional School (CF-16).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-15	Install permanent backup emergency power generator for Community Center (CF-20).	Municipal OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-16	System redundancy of water facility (town well) located on Helen Avenue (water tank is on Grand View Street).	Municipal OEM and Public Works Department	Low	Public Property Mitigation	\$100K - \$500K	Three to five years	Conduct project scoping.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-17	Install under-drains in Summit Section of Woodbury Heights (Alliance Street between Fordham Road and Central Avenue; sections of Auburn Street and Fordham Road) connecting to the storm sewer; new drainage would drop the groundwater level below the sanitary sewer system to avoid infiltration .	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	\$500K - \$1M	Ongoing	Conduct project scoping.
M-18	Upgrade stormwater collection capacity on Alliance Street.	Municipal OEM and Public Works Department	High	Public Property Flood Mitigation	< \$500K	One to three years	Conduct project scoping.
M-19	Upgrade storm collection system on Grandview Avenue through Fairview Avenue.	Municipal OEM and Public Works Department	High	Private Property Flood Mitigation	< \$500K	One to three years	Conduct project scoping.
M-20	Dredge Glen Lake to improved storm water collection.	Municipal OEM and Public Works Department	Low	Public Property Flood Mitigation	< \$500K	Three to five years	Conduct project scoping.
M-21	Floodproof / retrofit & harden Public Works Department Facility (CF-5).	Municipal OEM and Public Works Department	High	Public Property Mitigation	\$500K - \$1M	Three to five years	Conduct project scoping.
M-22	Retrofit / harden Police Department building (CF-3).	Municipal OEM, Public Works Department, Fire Department	High	Building Retrofit	\$500K - \$1M	Three to five years	Conduct project scoping.

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.24-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.24-4.

Table GC.24-13: Woodbury Heights Borough (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Improve storm drainage system at County Route 553 (Glassboro Road).	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-2	Sanitary sewer line on County Route 553 (Glassboro Road).	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	High

Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan – Base Plan (2012)
- Flood Damage Prevention⁵
- Master Plan Reexamination Report (2008)
- Stormwater Management Plan (2006)
- Zoning Map (2007)

⁵ <http://www.bwhnj.com/borough-ordinance.html>

Attachment A: Public Review Comments

The following comments were received during the public review of the Woodbury Heights Borough Municipal Appendix:

Table GC.24.A-1: Public Review Comments

Comment Date and Time	Comment	Response
December 8, 2014 @ 4:24 pm	Suggestion of having an additional critical facility serve as an alternate EOC. Designated EOCs are in close proximity to Conrail crossing and could be impacted should a train derail or chemicals be released.	Woodbury Heights Borough identified the Community Center as an additional alternate EOC.

Note: As of April 17, 2015, no other public review comments were received for the Woodbury Heights Borough Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.25
Woolwich Township, New Jersey

Draft

May 29, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.25-i
Part 1 Overview	GC.25-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.25-1
1.2: Woolwich Township (Gloucester County) Municipal Appendix	GC.25-1
Part 2 Participation	GC.25-2
2.1: Municipal Working Group Participation	GC.25-2
2.2: Public Participation	GC.25-4
Part 3 Hazard Identification and Risk Assessment	GC.25-5
3.1: Municipal Profile	GC.25-5
3.2: Hazard Priorities	GC.25-9
3.3: Hazard Mapping	GC.25-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.25-11
Part 4 Mitigation Measures	GC.25-14
4.1: Mitigation Goals and Strategy	GC.25-14
4.2: SDVR HMP Mitigation Measures	GC.25-15
4.3: Municipal Mitigation Measures – Identification	GC.25-16
4.4: Municipal Mitigation Measures – Implementation	GC.25-17
4.5: Multi-Jurisdictional Mitigation Measures	GC.25-19
4.6: Plan Review and Integration	GC.25-22

Table of Contents

List of Figures

Figure GC.25-1: Woolwich Township (Gloucester County) Location Map	GC.25-5
Figure GC.25-2: Woolwich Township Base Map	GC.25-6
Figure GC.25-3: Woolwich Township Housing Units by Year Built	GC.25-8
Figure GC.25-4: Woolwich Township Mitigation Project Locations	GC.25-21

List of Tables

Table GC.25-1: Woolwich Township (Gloucester County) Working Group	GC.25-2
Table GC.25-2: Public Participation	GC.25-4
Table GC.25-3: Woolwich Township Demographics	GC.25-7
Table GC.25-4: Woolwich Township Demographic Rankings	GC.25-7
Table GC.25-5: Woolwich Township Economics and Housing	GC.25-7
Table GC.25-6: Woolwich Township Ranking (Economics and Housing)	GC.25-8
Table GC.25-7: Supporting Mapping and Exhibits	GC.25-10
Table GC.25-8: Woolwich Township Critical Facilities Inventory	GC.25-12
Table GC.25-9: Woolwich Township Critical Facilities Hazard Exposure	GC.25-13
Table GC.25-10: Status of Woolwich Township SDVR HMP Mitigation Measures	GC.25-15
Table GC.25-11: Woolwich Township Municipal Mitigation Measures Identification	GC.25-16
Table GC.25-12: Woolwich Township Municipal Mitigation Measures Implementation	GC.25-18
Table GC.25-13: Woolwich Township Multi-Jurisdictional Mitigation Measures	GC.25-19

Attachments

Attachment GC.25.A: Public Review Comments	GC.25.A-1
Attachment GC.25.B: Adoption Resolution	GC.25.B-1
Attachment GC.25.C: Approval Letter	GC.25.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating municipalities in Camden, Cumberland, Gloucester, and Salem Counties. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- County and Municipal Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The County and Municipal Appendices include specific information for these same three main focus areas for each of the participating municipalities. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality.

Part 1.2: Woolwich Township (Gloucester County) Municipal Appendix

This Municipal Appendix is focused on Woolwich Township in Gloucester County, New Jersey.

The Woolwich Township Municipal Working Group recommended the Woolwich Township (Gloucester County) Municipal Appendix for adoption on [date to be determined].

The Woolwich Township Committee adopted the Municipal Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Municipal Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Municipal Working Group Participation

Part 2.1 includes:

- *Municipal Working Group members including positions in the community, meetings and work sessions attended, and specific contributions to the Municipal Appendix*
- *Municipal positions and organizations that were invited but were not able to participate in the plan update process*
- *Municipal positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Municipal Working Groups but do not exist in the municipality*

Table GC.25-1 identifies the Municipal Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Municipal Working Groups are comprised of community representatives who worked to make sure mitigation measures included in the Municipal Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the community. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.25-1: Woolwich Township (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Working Group Meetings ³	Contribution ⁴
Richard	Jaramillo	Woolwich Township Police Department	Sergeant / OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Samuel	Maccarone, Jr.	Woolwich Township Administration	Woolwich Township Mayor		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Jane	DiBella	Woolwich Township Administration	Administrator / Clerk	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Compiled data and information regarding the Master Plan and documents.
Jim	Sabetta	Woolwich Township Construction Code	Construction Official / Floodplain Administrator		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Edward	Johnson	Gloucester County	Chief Fire Marshal		<input checked="" type="checkbox"/>		
Anthony	Bertino	Woolwich Township Public Works	Public Works Manager		<input checked="" type="checkbox"/>		
Russell	Marino	Woolwich Township Police Department / Zoning Office	Chief of Police / Zoning Official		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

¹ Round 1 Work Session was held on July 17, 2014.

² Round 2 Work Session was held on September 25, 2014.

³ Municipal Working Group Meeting was held on December 23, 2014.

⁴ Municipal Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.25-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Working Group Meetings ³	Contribution ⁴
Sheldon	Lewis	Woolwich Township Police Department	Lieutenant		<input checked="" type="checkbox"/>		
Jim	Lavender	Woolwich Township Kingsway Regional School District	Superintendent of Schools		<input checked="" type="checkbox"/>		
Leigh	Donato	Swedesboro-Woolwich School District	Principal, Walter Hill School, Swedesboro-Woolwich School District		<input checked="" type="checkbox"/>		

The following lists candidate positions and organizations within the community that were extended invitations but could not participate during the development of the Municipal Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁵

- Land Use / Economic Development Planner
- Engineering
- Business Associations
- Community / Faith-Based Organizations
- Major Employers
- Healthcare Institutions
- School Board

The following lists positions and organizations that are generally recommended for consideration as members of the Municipal Working Groups by FEMA but do not currently exist within the community. An invitation to participate will be extended if positions are created or filled and as organizations are formed.

- GIS / IT Specialist
- Transportation Department Directors / Supervisors
- Emergency Medical Services
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources

⁵ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the municipality to participate during the plan update process.

Table GC.25-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.25-2: Public Participation

Date	Type of Involvement	Location
August 7, 2014	Link to Project Website (http://nj4hmp.com) established	Township website ⁶
November 18, 2014	Flyers posted	Municipal Building public area bulletin board, electronic bulletin board in front of Municipal Building, Township website ⁷
December 22, 2014	Preliminary Municipal Appendix posted to website for public comment	Township website ⁷
January 15, 2015	Flyers posted	Municipal Building public area bulletin board, electronic bulletin board in front of Municipal Building, Township website ⁷
January 15, 2015	Press release regarding hazard mitigation and plan development issued	Newton Press
February 17, 2015	Public hearing included on Woolwich Township Committee agenda providing for open discussion, and public comment regarding the Preliminary Municipal Appendix	Woolwich Township Municipal Building
[date to be determined in 2015]	Public meeting for plan adoption	[location to be determined]

Public comments and input received for the Preliminary Municipal Appendix were considered by the Municipal Working Group and incorporated into the Draft Municipal Appendix where appropriate. Public comments received during the review of the Preliminary Municipal Appendix were included in Attachment A to the Municipal Appendix along with a brief explanation of how the comments were addressed in the Draft Municipal Appendix.

Public education and outreach is an on-going mitigation measure included in the Municipal Appendix.⁷ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁸

⁶ <http://www.woolwichtwp.org/>

⁷ See Mitigation Measure M-1 in Part 4 of the Municipal Appendix.

⁸ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

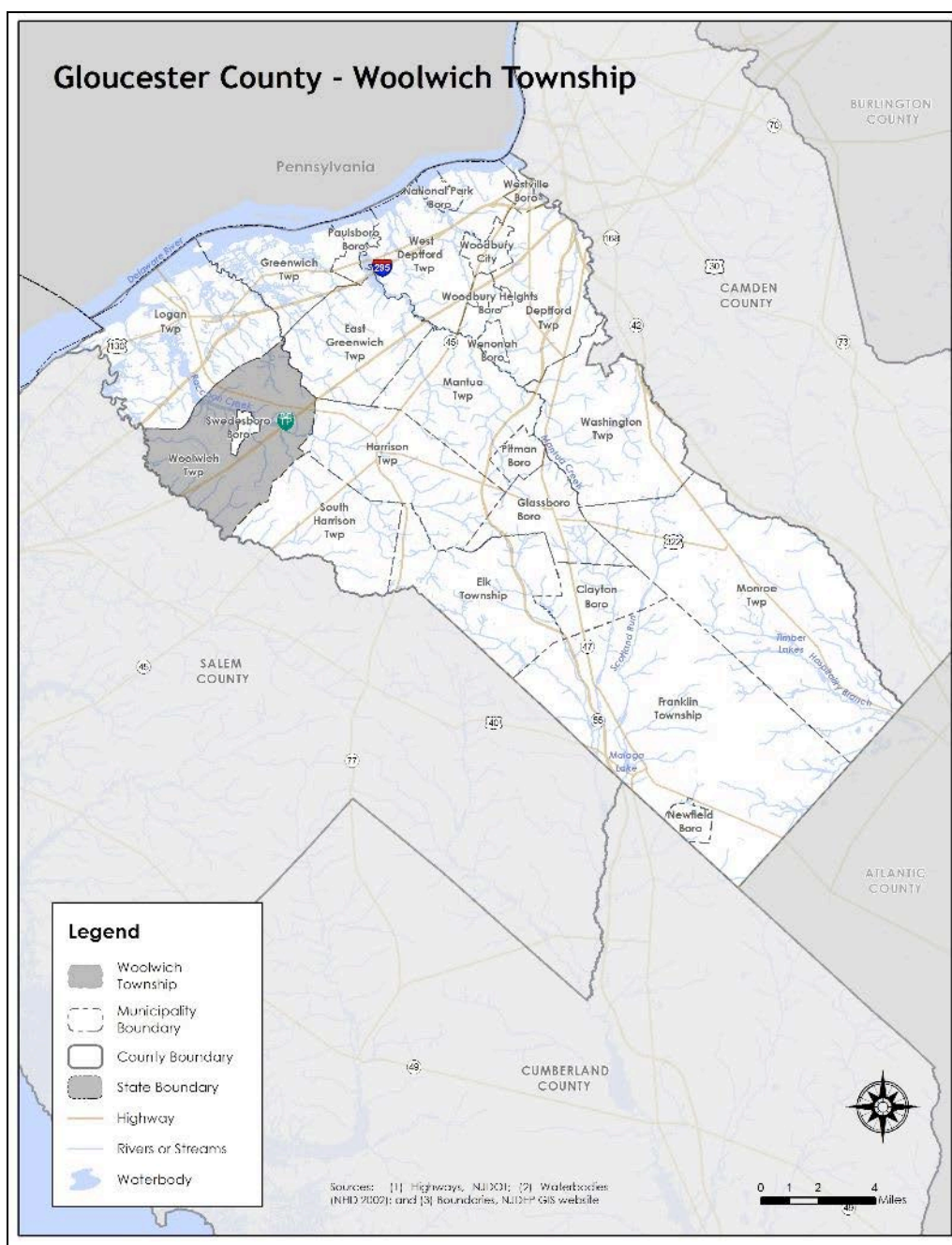
Part 3.1: Municipal Profile

Part 3.1 includes:

- *Selected data and information about the municipality that is generally relevant for emergency management planning and specifically for hazard mitigation*
- *A brief character sketch for the municipality that is only intended to portray a few of the most basic elements*

Woolwich Township is located in the western part of Gloucester County (See Figure GC.25-1).

Figure GC.25-1: Woolwich Township (Gloucester County) Location Map

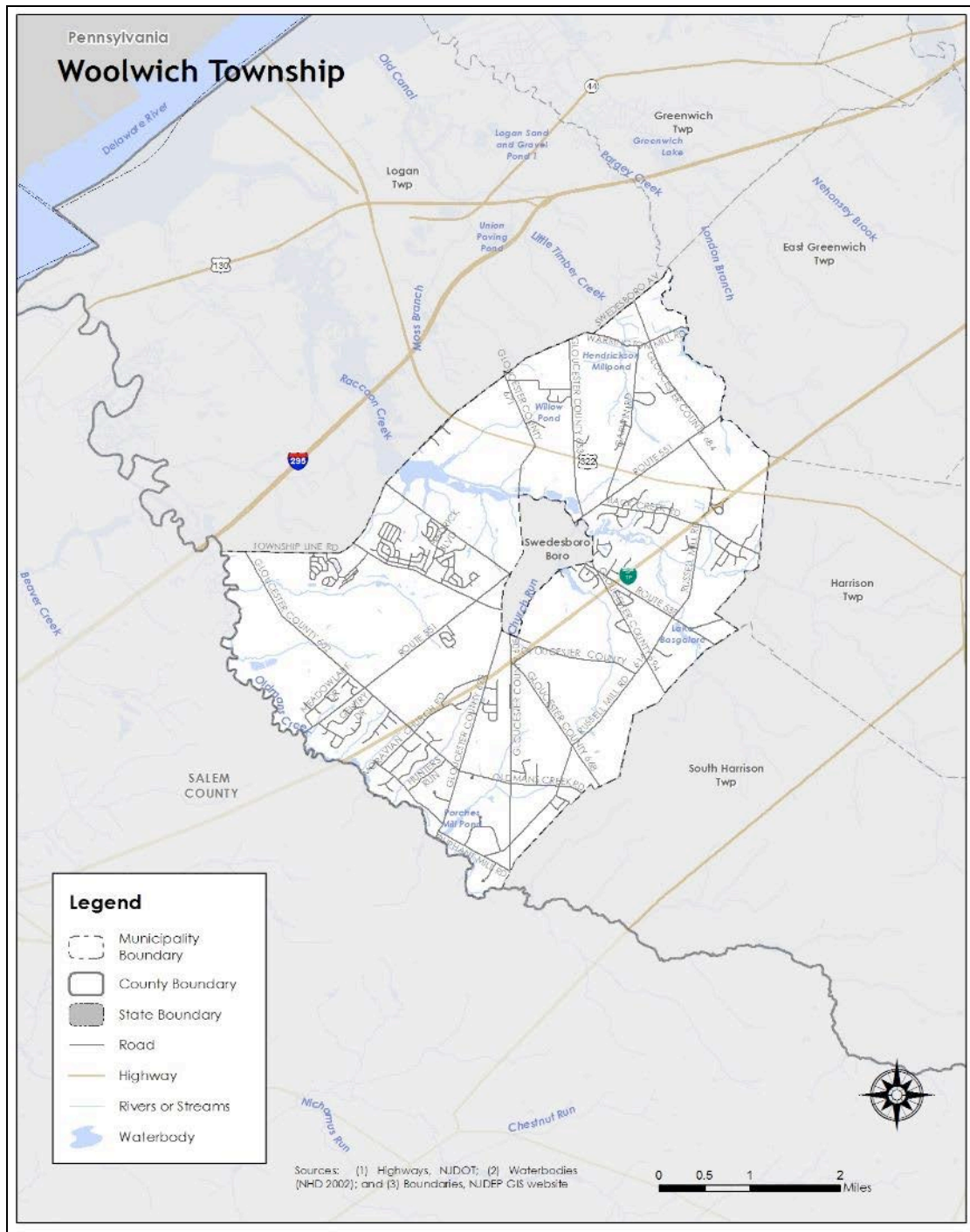


Part 3: Hazard Identification and Risk Assessment

Woolwich Township is a rural community in Gloucester County. Although the Township is within a short driving distance from city centers such as Philadelphia, Pennsylvania, it has designated farming and open space areas, giving it a “small town” appeal.

Per Figure GC.25-2, the major water courses include Raccoon Creek and Lake Basgalore. Major transportation routes include the New Jersey Turnpike and U.S. Highway 322. The land is predominantly flat.

Figure GC.25-2: Woolwich Township Base Map



Part 3: Hazard Identification and Risk Assessment

In addition, Table GC.25-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table GC.25-3: Woolwich Township Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Woolwich Township	Gloucester County	Region	New Jersey
2000 Population	3,032	254,673	974,328	8,414,350
2010 Population	10,200	288,288	1,024,926	8,791,894
Percent Change	236.41%	13.2%	5.19%	4.49%
Population Density	487.8 / sq. mile	895.3 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	20.91 sq. miles	322.00 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	33.5	24.4	24.1	23.5
% of Population 18 - 64	60.1	63.2	62.7	63
% of Population 65 and over	6.4	12.4	13.2	13.5

Table GC.25-4 illustrates how Woolwich Township ranks in the county, the four county region, and New Jersey.

Table GC.25-4: Woolwich Township Demographic Rankings

	Gloucester County (total of 24)	Region (total of 90)	New Jersey (total of 565)
Population Rank	9	27	240
Land Area Rank	5	26	129
Population Density Rank	20	62	443
Population Change Rank	1	1	-

Table GC.25-5 includes information related to economic and housing statistics for Woolwich Township, Gloucester County, the four county region, and New Jersey.

Table GC.25-5: Woolwich Township Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Woolwich Township	Gloucester County	Region	New Jersey
Date Incorporated	February 21, 1798	1686	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$109,360	\$72,664	\$60,933	\$69,811
Total Number of Housing Units	3,275	109,796	397,990	3,529,033
Occupied Housing Units	3,141	104,271	372,472	3,176,069
Vacant Housing Units	134	5,525	25,518	352,964
Owner Occupied Housing Units	2,834	83,525	266,593	2,126,279
Renter occupied Housing Units	307	20,746	105,879	1,049,790

Part 3: Hazard Identification and Risk Assessment

	Woolwich Township	Gloucester County	Region	New Jersey
Building Permits	63	716	1,554	13,535
Largest Industry	Educational Services; Agriculture, Forestry, Fishing and Hunting; Manufacturing	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

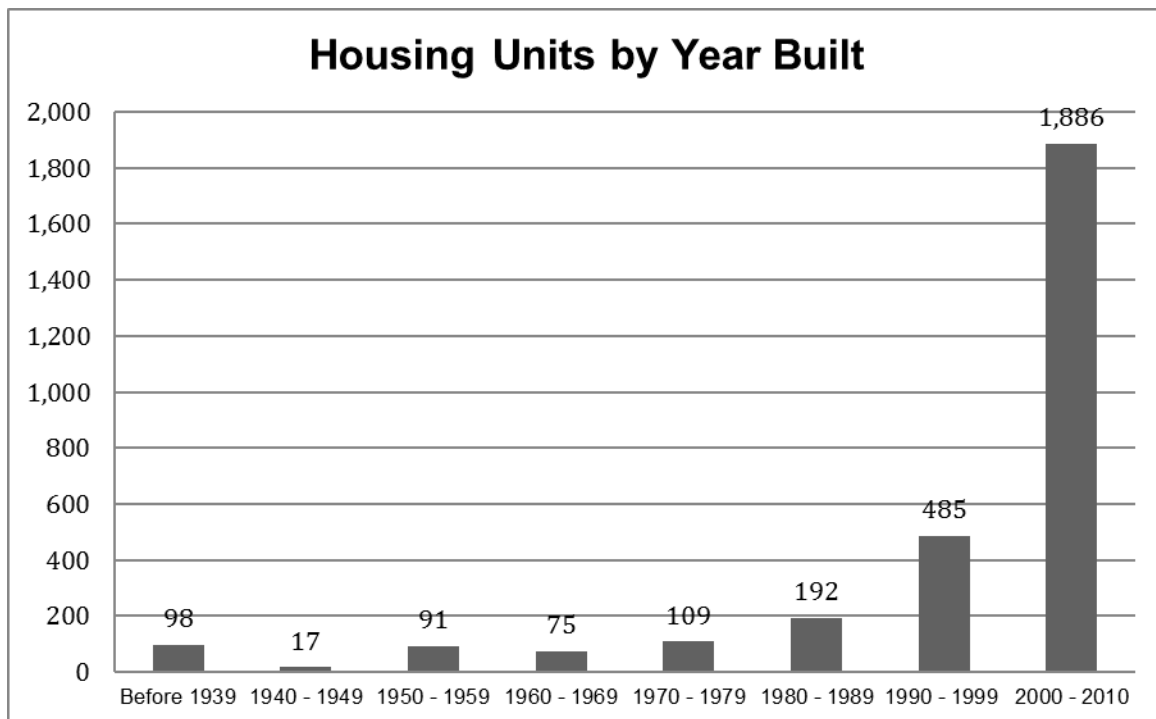
Table GC.25-6 illustrates how Woolwich Township ranks in the county and the four county region.

Table GC.25-6: Woolwich Township Ranking (Economics and Housing)

	Gloucester County (total of 24)	Region (total of 90)
Median Household Income Rank	1	3
Vacant Housing Rank	15	49
Renter Occupied Housing Rank	16	58
Building Permits Rank	4	7

Figure GC.25-3 illustrates development patterns in Woolwich Township by examining housing units by year built. More than half of the homes in Woolwich Township were built during 2000-2010.

Figure GC.25-3: Woolwich Township Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹ were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified. The Municipal Working Group rated the hazards as follows:

High Priority

- Dam Failure

Moderate Priority

- Drought
- Flood
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Low Priority

- Earthquake
- Extreme Temperature: Cold & Hot
- Wildfire

Three additional hazards were discussed but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Geologic Hazards
- Levee Failure

¹ See Section 3: Hazard Identification and Risk Assessment.

Part 3: Hazard Identification and Risk Assessment

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.25-7 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps and exhibits correspond to the hazards identified by the Municipal Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.25-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge)	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where inundation due to storm surge may occur
Figure RP.D-99	Wildfire	Wildland Fuel Hazard Risk	Identify areas subject to wildfire
Figure RP.D-106	Wildfire	Wildland Urban Interface (WUI)	Identify areas subject to wildfire

The following hazards are not referenced as these hazards occur uniformly across the municipality and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for municipal critical facilities*
- *Hazard exposure analysis results for municipal critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.25-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table GC.25-9 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.25-8: Woolwich Township (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Municipal Building	Municipal	Administrative Offices	120 Village Green Drive, Woolwich		Y	Y		
CF-2	Emergency Operations Center	EOC	Co-located Facilities	120 Village Green Drive, Woolwich	CF-1	Y	Y		
CF-3	Emergency Operations Center	EOC	Co-located Facilities	1517 Kings Highway, Swedesboro		Y	Y	Alternate EOC	
CF-4	Woolwich Township Police Department	Law Enforcement Facilities	Stations	120 Village Green Drive, Woolwich	CF-1	Y	Y		
CF-5	Fire Department Substation	FireStation / EMS	Stations	124 Woodstown Road, Woolwich		Y	Y		
CF-6	Woolwich Fire Company (25-1)	FireStation / EMS	Stations	1517 Kings Highway, Swedesboro		Y	Y		
CF-7	Public Works	Public Works	Administrative Offices	124 Woodstown Road, Woolwich	CF-5	Y	Y	Includes a substation	
CF-8	Public Works Garage	Public Works	Maintenance / Work Areas	56 Lock Avenue, Woolwich		N	N		
CF-9	Gov. Charles C. Stratton School	Schools	Public Schools	15 Fredrick Boulevard, Woolwich		Y	Y ²		M-5
CF-10	General Charles G. Harker School	Schools	Public Schools	1771 Oldmans Creek Road, Woolwich		Y	Y ²		M-6
CF-11	Kingsway Regional Middle School	Schools	Public Schools	213 Kings Highway, Woolwich		Y ³	Y ²		M-7
CF-12	Kingsway Regional High School	Schools	Public Schools	201 Kings Highway, Woolwich		Y ³	Y ²		M-8

² Back-up generator provides partial building coverage for emergency lighting.

³ Red Cross designated shelter.

Part 3: Hazard Identification and Risk Assessment

Table GC.25-9: Woolwich Township (Gloucester County) Critical Facilities Hazard Exposure⁴

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Municipal Building	N/A	N/A	N/A		N/A							N/A		
CF-2	Emergency Operations Center	N/A	N/A	N/A		N/A							N/A		
CF-3	Emergency Operations Center	N/A	N/A	N/A		N/A							N/A		
CF-4	Woolwich Township Police Department	N/A	N/A	N/A		N/A							N/A		
CF-5	Fire Department Substation	N/A	N/A	N/A		N/A							N/A		
CF-6	Woolwich Fire Company (25-1)	N/A	N/A	N/A		N/A							N/A		
CF-7	Public Works	N/A	N/A	N/A		N/A							N/A		
CF-8	Public Works Garage	N/A	N/A	N/A		N/A							N/A		
CF-9	Gov. Charles C. Stratton School	N/A	N/A	N/A		N/A							N/A		
CF-10	General Charles G. Harker School	N/A	N/A	N/A		N/A							N/A		
CF-11	Kingsway Regional Middle School	N/A	N/A	N/A		N/A							N/A		
CF-12	Kingsway Regional High School	N/A	N/A	N/A		N/A							N/A		

⁴ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Municipal Appendix. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Municipal Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the municipality's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Municipal Working Group for use in the Municipal Appendix. All mitigation measures in the Municipal Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** at municipal, county, and state levels to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as additional initial risk reduction efforts
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and better integration of related regulatory programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the municipality's mitigation program

The mitigation measures described in Parts 4.3 through 4.5 of the Municipal Appendix reflect this strategy.

Part 4: Mitigation Measures

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the municipality in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Municipal Appendix.

Table GC.25-10 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Municipal Appendix as indicated in the “Comments” column and the far right-hand column of Table GC.25-10.

Table GC.25-10: Status of Woolwich Township (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Woolwich 1: Engineering study to determine course of action for elevation / acquisition of home on Licciardello Drive.	Not completed, not funded	Revised mitigation measure is included in the updated Municipal Appendix.	M-10
Woolwich 2: Engineering study to determine course of action to improve floodwalls for High Hill Road and Moravian Road.	Not completed, not funded	Revised multi-jurisdictional measure is included in the updated Municipal Appendix.	MJ-1 / MJ-2
Woolwich 3: Critical facilities protection / hazard threat recognition of HazMat (Grasso Foods Inc. is the largest pepper packing plant in the country. Services all 50 states & designated tier one facility).	Not completed, not funded	Revised multi-jurisdictional measure is included in the updated Municipal Appendix.	MJ-5

Table GC.25-10 Notes:

- A. See Tables GC.25-11 and GC.25-12 for municipal (M-#) mitigation measures
- B. See Table GC.25-13 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Municipal Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the municipality.

Table GC.25-11 includes the list of mitigation measures that are considered the responsibility of the municipality. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Municipal Working Groups including measures to address known problems or areas of concern for critical facilities and vulnerable populations
- Address Repetitive Flood Loss (RL) and Severe Repetitive Flood Loss Properties (SRL)¹ if applicable

Note: Woolwich Township does not currently have RL or SRL properties per information provided by the New Jersey Department of Environmental Protection.

Table GC.25-11 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Note: Mitigation measures with discrete locations are shown in Figure GC.25-4.

Table GC.25-11: Woolwich Township (Gloucester County) Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or property level.²	All	Goal #1	Both
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	All	Goal #2	Existing

¹ See *Section 3: Hazard Identification and Risk Assessment* and related portions of Annex D of the NJ4 HMP Regional Hazard Mitigation Plan for a description of RL and SRL properties.

² For example, individual property owners can be informed about back-up power alternatives such as initial battery back-up for power disruptions.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-4	Conduct regular Municipal Working Group meetings consistent with the plan maintenance program and the Municipal Adoption Resolution.	All	Goal #3	Both
M-5	Upgrade back-up emergency power generator at Governor Charles C. Stratton School (CF-9).	All	Goal #4	Both
M-6	Upgrade back-up emergency power generator at General Charles G. Harker School (CF-10).	All	Goal #4	Both
M-7	Upgrade back-up emergency power generator at Kingsway Regional Middles School (CF-11).	All	Goal #4	Both
M-8	Upgrade back-up emergency power generator at Kingsway Regional High School (CF-12).	All	Goal #4	Both
M-9	Assessment of two private dams	Dam Failure	Goal #4	Existing
M-10	Elevation / acquisition of home on Liccardello Drive.	Flood	Goal #4	Both
M-11	Upgrade Dryden Driving Bridge at Russell Mill Road and Winding Way.	Flood	Goal #4	Both

Part 4.4: Municipal Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the municipal mitigation measures.

Table GC.25-12 includes information identified by the Municipal Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria³
- Project Type to help determine funding options and implementation mechanisms at the municipal level⁴
- Estimated Cost, including estimates provided by the Municipal Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the municipal level

³ See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Municipal Working Group.

⁴ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

Part 4: Mitigation Measures

Table GC.25-12: Woolwich Township (Gloucester County) Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Municipal OEM, Township Administration, Police Department	Low	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> Work with County Working Group to identify resource needs and availability. Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Municipal OEM and Facility Managers	Low	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.	Municipal OEM and Municipal Working Group	Low	Capabilities and Coordination	Staff time commitment	On-going	Identify recurrent drainage problem areas, establish priorities, and identify data collection procedures.
M-4	Conduct regular Municipal Working Group meetings.	Municipal OEM and Municipal Working Group	Low	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Municipal Working Group membership, reporting requirements, and meeting / work session schedule.
M-5	Upgrade back-up emergency power generator at Governor Charles C. Stratton School (CF-9).	Municipal OEM, Public Works Department, School Board	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-6	Upgrade back-up emergency power generator at General Charles G. Harker School (CF-10).	Municipal OEM, Public Works Department, School Board	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-7	Upgrade back-up emergency power generator at Kingsway Regional Middles School (CF-11).	Municipal OEM, Public Works Department, School Board	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-8	Upgrade back-up emergency power generator at Kingsway Regional High School (CF-12).	Municipal OEM, Public Works Department, School Board	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Conduct project scoping.
M-9	Assessment of two private dams	Municipal OEM, Public Works, Private Owners	Low	Private Property Dam Mitigation	< \$50K	Three to five years	Contact property owners and jointly develop scope of work for engineering study and determine responsibilities for procuring professional consulting services.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-10	Elevation / acquisition of home on Luccardello Drive.	Floodplain Administrator and Private Owners	High	Private Property Flood Mitigation	\$500K - \$1M	One to three years	Prior to initiating landowner contacts, identify flood insurance implications and mitigation options including eligible activities per FEMA HMA programs.
M-11	Upgrade Dryden Driving Bridge at Russell Mill Road and Winding Way.	Municipal OEM, Public Works Department	Moderate	Private Property Flood Mitigation	\$100K - \$500K	Three to five years	Conduct project scoping.

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Municipal Working Group Work Sessions, the Municipal Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.25-13.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Municipal Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working with the municipalities to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Note: Multi-jurisdictional mitigation measures with discrete locations are shown in Figure GC.25-4.

Table GC.25-13: Woolwich Township (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Alleviate flooding at County Route 662 (High Hill Road).	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW	Moderate
MJ-2	Floodwalls County Route 662 (High Hill Road) and Moravian Road.	Flood	Goal #4	Existing	Municipal OEM, Gloucester County DPW	Moderate
MJ-3	Alleviate flooding at County Route 605 (Woodstown Road) at Salem County border.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW, Salem County DPW	Moderate

Part 4: Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Responsible Party	Priority
MJ-4	Alleviate flooding at Kings Highway County Line Bridge.	Flood	Goal #4	Both	Municipal OEM, Gloucester County DPW, Salem County DPW	Moderate
MJ-5	Critical facilities protection / hazard threat recognition of HazMat (Grasso Foods Inc. is the largest pepper packing plant in the country. Services all 50 state & designated a Tier I facility). ⁵	Hazardous Materials	Goal #4	Existing	Municipal OEM, Grasso Foods Inc.	Moderate

⁵ Although natural hazards are the focus of the NJ4 HMP, these technological hazards are a continuing concern to the community and are documented in the Municipal Appendix to reflect the full range of hazards within Woolwich Township.

Part 4: Mitigation Measures

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the municipal level*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining municipal hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs at the municipal level

Specific documents obtained during the plan update process from the Municipal Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Emergency Operations Plan (2013)
- Master Plan (2008)
- Floodplain Ordinance (1994)
- Land Use Ordinance (2010)
- Stormwater Management Plan (2006)

Attachment A: Public Review Comments

The following comments were received during the public review of the Woolwich Township Municipal Appendix:

Table GC.25.A-1: Public Review Comments

Comment Date and Time	Comment	Response

Note: As of May 29, 2015, no public review comments were received for the Woolwich Township Municipal Appendix.



Mitigation Plan for Four New Jersey Counties
Gloucester County Appendices

Appendix GC.26
Rowan University

Draft

April 17, 2015

Notes to Draft NJ4 HMP Reviewers:

The April 17, 2015 Draft Appendices for the Mitigation Plan for Four New Jersey Counties NJ4 HMP contain highlighted passages and entries per the following:

- **Yellow highlighted items** are pending designation of the NJ4 HMP as “approvable pending adoption” and related plan approval and adoption proceedings.
- **Green highlighted items** are work-in-progress. Completion of these items will continue after the formal plan review period as part of plan implementation efforts and are not considered necessary to meet plan review requirements.

Table of Contents

Table of Contents	GC.26-i
Part 1 Overview	GC.26-1
1.1: Mitigation Plan for Four New Jersey Counties	GC.26-1
1.2: Rowan University (Gloucester County) Appendix	GC.26-1
Part 2 Participation	GC.26-2
2.1: Working Group Participation	GC.26-2
2.2: Public Participation	GC.26-4
Part 3 Hazard Identification and Risk Assessment	GC.26-5
3.1: Rowan University Profile	GC.26-5
3.2: Hazard Priorities	GC.26-9
3.3: Hazard Mapping	GC.26-10
3.4: Critical Facilities Inventory and Hazard Exposure Assessment	GC.26-11
Part 4 Mitigation Measures	GC.26-16
4.1: Mitigation Goals and Strategy	GC.26-16
4.2: SDVR HMP Mitigation Measures	GC.26-17
4.3: Mitigation Measures – Identification	GC.26-18
4.4: Mitigation Measures – Implementation	GC.26-19
4.5: Multi-Jurisdictional Mitigation Measures	GC.26-20
4.6: Plan Review and Integration	GC.26-22

Table of Contents

List of Figures

Figure GC.26-1: Rowan University (Gloucester County) Campus Locations	GC.26-6
Figure GC.26-2: Rowan University Resident Halls and Apartments	GC.26-7

List of Tables

Table GC.26-1: Rowan University (Gloucester County) Working Group	GC.26-2
Table GC.26-2: Public Participation	GC.26-4
Table GC.26-3: Rowan University Staff and Enrollment	GC.26-5
Table GC.26-4: Supporting Mapping and Exhibits	GC.26-10
Table GC.26-5: Rowan University Critical Facilities Inventory	GC.26-12
Table GC.26-6: Rowan University Critical Facilities Hazard Exposure	GC.26-14
Table GC.26-7: Status of Rowan University SDVR HMP Mitigation Measures	GC.26-17
Table GC.26-8: Rowan University Mitigation Measures Identification	GC.26-18
Table GC.26-9: Rowan University Mitigation Measures Implementation	GC.26-19
Table GC.26-10: Rowan University Multi-Jurisdictional Mitigation Measures	GC.26-20

Attachments

Attachment GC.26.A: Public Review Comments	GC.26.A-1
Attachment GC.26.B: Adoption Resolution	GC.26.B-1
Attachment GC.26.C: Approval Letter	GC.26.C-1

Part 1.1: Mitigation Plan for Four New Jersey Counties

The Mitigation Plan for Four New Jersey Counties (NJ4 HMP) incorporates input from approximately ninety (90) participating jurisdictions in Camden, Cumberland, Gloucester, and Salem Counties including counties, municipalities, and Rowan University. The NJ4 HMP is an update and expansion of the South Delaware Valley Region Multi-jurisdictional Hazard Mitigation Plans that were adopted by all four counties and approved by the Federal Emergency Management Agency in 2010 and 2011.

The NJ4 HMP has two main parts:

- Regional Hazard Mitigation Plan
- Jurisdictional Appendices

The Regional Hazard Mitigation Plan includes descriptions and information that is common to all participating NJ4 HMP jurisdictions organized according to the following three main focus areas:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Measures

The Regional Hazard Mitigation Plan also includes Annexes that contain detailed background information for these three focus areas and additional reference materials for the implementation of the NJ4 HMP.

The Jurisdictional Appendices include specific information for these same three main focus areas for each of the participating jurisdiction. Detailed tabulations are included in these Appendices for critical facilities, status of past mitigation activities, and proposed mitigation measures for each municipality and Rowan University.

Part 1.2: Rowan University (Gloucester County) Appendix

This Appendix is focused on Rowan University in Gloucester County, New Jersey.

The Rowan University Working Group recommended the Rowan University (Gloucester County) Appendix for adoption on [date to be determined].

The Rowan University Board of Trustees adopted the Appendix by resolution on [date to be determined].

Region II of the Federal Emergency Management Agency subsequently approved the Rowan University Appendix on [date to be determined].

Part 2: Participation

Part 2.1: Working Group Participation

Part 2.1 includes:

- Working Group members including positions in the University and/or surrounding communities, meetings and work sessions attended, and specific contributions to the Appendix
- Positions and organizations that were invited but were not able to participate in the plan update process
- Positions and organizations that have been recommended by the Federal Emergency Management Agency (FEMA) as candidates for participation on Working Groups but do not exist in the University

Table GC.26-1 identifies the Rowan University Working Group members. As explained in *Section 2: Planning Process* of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) Regional Hazard Mitigation Plan, the Working Groups are comprised of University and community representatives who worked to make sure mitigation measures included in the Appendix addressed the risks faced by University students, faculty, and staff and reflected the priorities of the University. The Working Group will also continue to stay involved during the implementation and maintenance of the NJ4 HMP.

Table GC.26-1: Rowan University (Gloucester County) Working Group

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Working Group Meeting ³	Contribution ⁴
Peter	Amico	Rowan University Department of Public Safety / Office of Emergency Management	Director	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Organized Working Group and Work Sessions.
Michael	Kantner	Rowan University Department of Public Safety / Office of Emergency Management	Assistant Vice President / Emergency Management Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Joe	Monahan	Rowan University Facilities Planning and Construction	Assistant Vice President	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
James	Lovegrove	Rowan University Facilities and Operations	Assistant Vice President of Facilities and Operations		<input checked="" type="checkbox"/>		
Arijit	De	Rowan University Facilities Planning and Operations	Senior Director, Campus Planning and Sustainability	<input checked="" type="checkbox"/>			
Ed	Thompson	Rowan University Facilities Planning	Director, Environmental and Landscape Planning	<input checked="" type="checkbox"/>			

¹ Round 1 Work Session was held on August 12, 2014.

² Round 2 Work Session was held on October 17, 2014.

³ A Working Group meeting was held on December 5, 2014 to review the Preliminary Rowan University Appendix.

⁴ Working Group members reviewed briefing materials in advance of Work Sessions, contributed during Work Sessions, and reviewed the preliminary Mitigation Plan for Four New Jersey Counties. Additional or unusual contributions are noted in the far right hand column of Table GC.26-1.

Part 2: Participation

First Name	Last Name	Department	Position	Round 1 Work Session ¹	Round 2 Work Session ²	Working Group Meeting ³	Contribution ⁴
Kyle	Gandy	Rowan University Facilities ⁵	Director of Energy Management / University Engineer	<input checked="" type="checkbox"/>			
Kevin	Muldoon	Rowan University Facilities Operations	Chief of Facilities	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Eileen	Morrow	Rowan University Loss Control Services, Risk Management and Insurance	Director	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Jack	Glass	Rowan University Environmental Health and Safety	Director		<input checked="" type="checkbox"/>		
Jack	Manning	Glassboro Borough Office of Emergency Management	Detective / OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

The following lists candidate positions, groups, and organizations within the University and surrounding community that were extended invitations but could not participate during the development of the Rowan University Appendix. These positions and organizations will continue to be extended invitations to participate during subsequent plan implementation and maintenance activities.⁶

- Rowan University Student Government
- Rowan University students
- Rowan University faculty and staff
- Glassboro Borough Engineer

The following lists positions and organizations that are generally recommended for consideration as members of municipal Working Groups by FEMA but do not generally apply to a university.

- Floodplain Administrator
- Building Code Official
- Major Employers and Businesses
- Healthcare Institutions

⁵ Mr. Gandy resigned from Rowan University prior to the Round 2 Working Session.

⁶ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 2: Participation

Part 2.2: Public Participation

Part 2.2 includes opportunities provided to the public and interested parties in the University and/or surrounding communities to participate during the plan update process.

Table GC.26-2 identifies the date, type, and location (where applicable) for opportunities provided to the public and interested parties to participate in the development of the plan update.

Table GC.26-2: Public Participation

Date	Type of Involvement	Location
August 15, 2014	Link to Project Website (http://nj4hmp.com) established	Rowan University Public Safety/Emergency Management webpage ⁷
October 7, 2014	Mass email sent to Rowan University Staff and Students re: on-going planning process	Rowan Daily Mail – Employees and Rowan Daily Mail - Students
November 19, 2014	Preliminary Rowan University Appendix posted to website for public comment	Rowan University Public Safety/Emergency Management webpage ⁶
November 28, 2014	Mass email sent to Rowan University Staff and Students re: availability of Preliminary Rowan University Appendix for review and comment	Rowan Daily Mail – Employees and Rowan Daily Mail - Students
December 1, 2014	Public hearing providing for open discussion, and public comment regarding the Preliminary Rowan University Appendix	Chamberlain Student Center, Room 128, Rowan University Glassboro Campus
[date to be determined]	Public meeting of Rowan University Board of Trustees for plan adoption	[location]

Comments and input received for the Preliminary Rowan University Appendix were considered by the Working Group and incorporated into the Draft Rowan University Appendix where appropriate. Comments received during the review of the Preliminary Rowan University Appendix are included in Attachment A along with how the comments were addressed in subsequent versions of the Rowan University Appendix. In addition, participation by the public and interested parties will continue to be encouraged during subsequent plan implementation and maintenance activities.⁸

⁷ <http://www.rowan.edu/safety/>

⁸ See *Section 4: Mitigation Measures* of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3.1: Rowan University Profile

Part 3.1 includes selected data and information about Rowan University.

The Rowan University Appendix covers Rowan University facilities at the following locations (See Figure GC.26-1):

- Main Campus in Glassboro Borough
- Rowan University at Camden - satellite Campus located at the corner of North Broadway and Cooper Street in Camden City
- Cooper Medical School of Rowan University - located in Camden City
- Rowan University School of Osteopathic Medicine - located in Stratford Borough
- South Jersey Technology Park - located in Mantua Township at the intersection of Routes 322 and 55, approximately one mile from the Main Campus

Main Campus

The main campus for Rowan University is located within Glassboro Borough. The University offers degree programs in approximately 40 categories including:

- Education
- Business / Marketing
- Communications / Journalism
- Psychology
- Homeland Security, Law Enforcement, Fire Fighting, and Protective Services

Table GC.26-3 includes selected staff and enrollment figures for the main campus.¹

Table GC.26-3: Rowan University Staff and Enrollment
(Source: Rowan University Office of Institutional Effectiveness 2014 Common Data)²

Undergraduate Enrollment (full and part-time)	12,022
Graduate Enrollment (full and part-time)	2,756
Instructional Faculty	1,312
Total Rowan University Students and Faculty	16,090

36% of students live in university owned, operated or affiliated housing. Figure GC.26-2 indicates the number of students residing in specific university housing facilities. The remaining students either commute from off-campus housing or attend classes on-line.

¹ Staff and enrollment figures from the Office of Institutional Effectiveness include the Rowan University Main Campus in Glassboro and the Rowan University at Camden

² <http://www.rowan.edu/president/ierp/cds/index.html>

Part 3: Hazard Identification and Risk Assessment

Figure GC.26-1: Rowan University (Gloucester County) Campus Locations

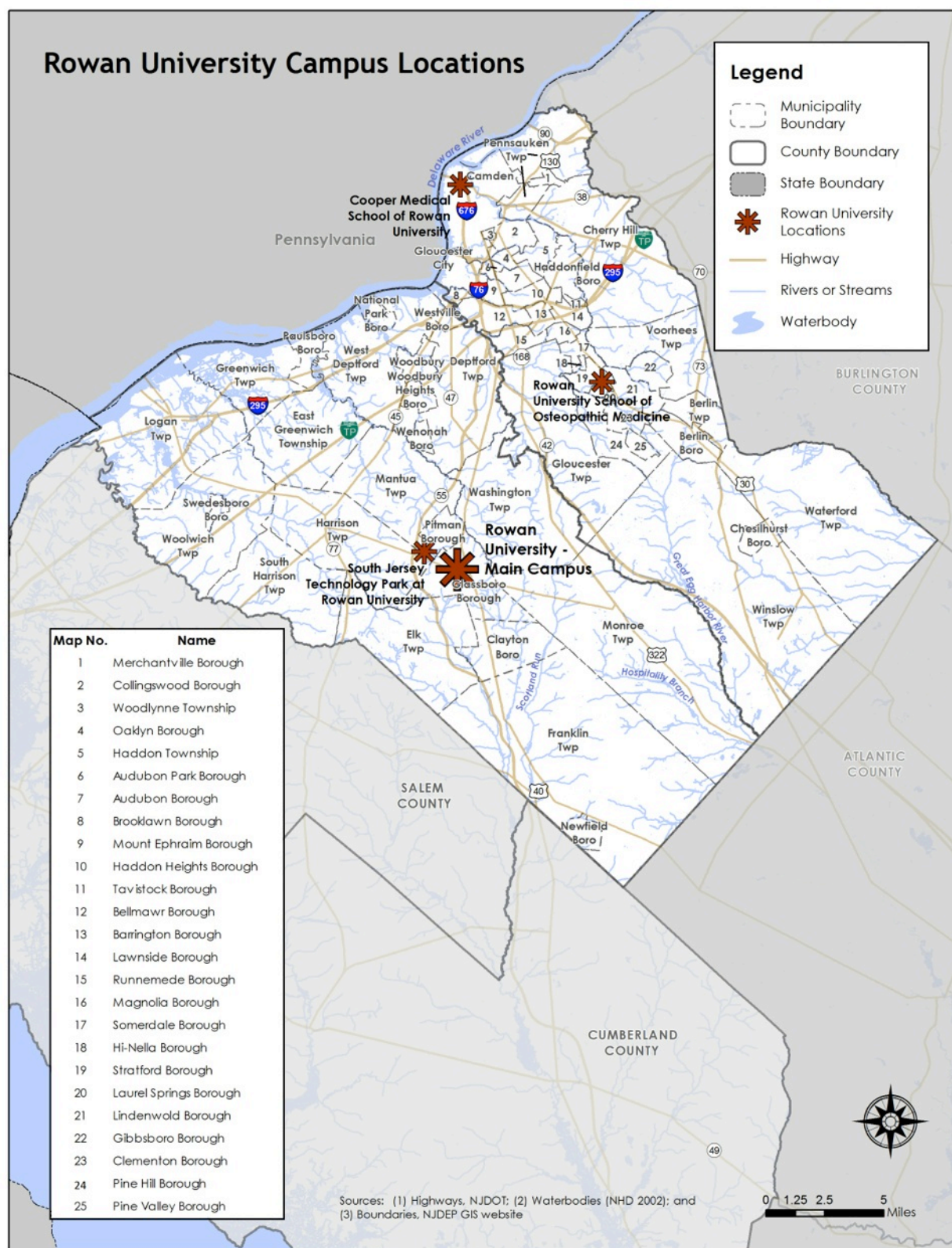
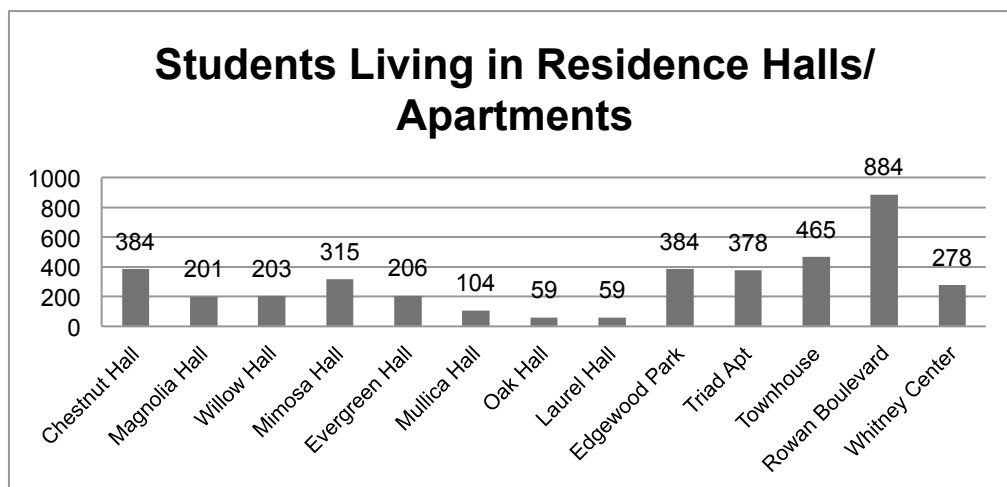


Figure GC.26-2: Rowan University's Resident Halls & Apartments
(Source: Rowan University Website, U.S. News and World Report)



Rowan University has embarked on a program of expansion that includes ongoing and programmed additions of several facilities to the Main Campus. The target enrollment figure that serves as the basis for Rowan University's expansion is 25,714 full and part-time undergraduate and graduate students by the year 2024.³

The current Rowan University Long-Range Master Facilities Plan,⁴ as amended in February 2013, identifies key projects that are anticipated for completion in the near future on the Main Campus:

- College of Engineering Addition / Building – 90,500 square foot addition located in the current Parking Lot M-1
- College of Business Building – 110,000 square foot new building located in the current Parking Lot A
- Parking – two adjacent lots, each with 700-car capacity located in current athletic practice fields near James Hall
- Village Housing – 1400 bed student housing, cafeteria, and Residential Life administrative offices located at Mullica Road and Main Street in the current Parking Lot X

Rowan University at Camden

Rowan University's Camden Campus is located in the University District of Camden in a five-story 54,000 square foot facility at Broadway and Cooper Street. It features 40 classrooms, a community room, student and faculty lounges and computer labs. The University shares the building with Camden County College in a collaborative education effort. In addition, students have full library privileges and recreation center use at Rutgers University/Camden.⁵

³ Joe Cardona, University Relations, Office of the President

⁴ <http://www.rowan.edu/open/masterplan/>

⁵ <http://www.rowan.edu/camden/about/index.cfm>

Cooper Medical School of Rowan University

Cooper Medical School of Rowan University (CMSRU) is a public medical school located in Camden City. In 2009, then Governor Jon Corzine issued an executive order that established a partnership between Rowan University and Cooper University resulting in the first new medical school established in New Jersey in over 35 years. Cooper Medical School is the only four-year MD-granting medical school in South Jersey.

CMSRU is housed in a 203,000 square foot, six story building that was opened in summer 2012 and has admitted its first two classes. Current enrollment is 114 but is anticipated to reach a full enrollment of 416 after two more classes are admitted⁶. It is the first new medical school established in New Jersey in over 35 years and the only four-year MD-granting medical school in South Jersey.

Rowan University School of Osteopathic Medicine

Rowan University School of Osteopathic Medicine (RowanSOM) has 178 full-time faculty, 40 part-time faculty, and over 484 volunteer faculty to provide instructional services to over 600 enrolled students⁷ as well as 400+ interns, residents and fellows⁸

The New Jersey State Legislature established RowanSOM in 2012 with the passage of the New Jersey Medical and Health Sciences Education Restructuring Act that merged the Stratford New Jersey campus of the University of Medicine and Dentistry of New Jersey with Rowan University. The US News & World Report has recently ranked it as one of the top 20 medical schools for geriatric care.⁹

South Jersey Technology Park

Located a little more than a mile from Rowan University's main campus, the Tech Park site is adjacent to Route 55 and Route 322 in Mantua Township. Sites that are adjacent to the central campus, particularly the development areas located along Route 55, will accommodate research related facilities for mature technology companies or for government agencies that seek large free-standing sites for build-to-suit facilities with good visibility from Route 55, as well as proximity to the central campus of the Tech Park. When completed, the Tech Park will feature approximately 1.5 million square feet of mixed academic and corporate facilities.¹⁰

The South Jersey Technology Park is owned by an independent 501(c) organization. However, Rowan University is also an anchor tenant in the Park.

⁶ <https://services.aamc.org/30/msar/schoolDetails/568/about>

⁷ <http://grad-schools.usnews.rankingsandreviews.com/best-graduate-schools/top-medical-schools/rowan-university-04138>

⁸ <http://www.rowan.edu/som/about/>

⁹ http://www.rowan.edu/som/news_events/news/home_bestschools.pdf

¹⁰ <http://sjtechpark.org/the-master-plan/>

Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Rowan University Working Group.

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the twelve (12) natural hazards identified in the NJ4 HMP¹¹ were discussed during the Working Group Work Sessions and the relative priority of these hazards was identified. The Working Group rated the hazards as follows:

High Priority

- Flood
- High Wind

Moderate Priority

- Coastal Erosion & Sea Level Rise¹²
- Earthquake

Low Priority

- Dam Failure
- Extreme Temperature: Hot & Cold
- Severe Weather – Summer
- Severe Weather – Winter

Four additional hazards were considered but were not considered applicable to the university:

- Drought
- Geologic Hazards
- Levee Failure
- Wildfire

¹¹ See *Section 3: Hazard Identification and Risk Assessment*.

¹² Cooper Medical School of Rowan University

Part 3.3: Hazard Mapping

Part 3.3 includes cross references to hazard inventory and risk assessment mapping included in the NJ4 HMP Regional Hazard Mitigation Plan.

Table GC.26-4 provides information regarding hazard inventory mapping included in *Annex D: Hazard Profiles and Risk Assessments* of the NJ4 HMP that support the Hazard Identification and Risk Assessment (HIRA) for the Rowan University Appendix. The indicated maps and exhibits correspond to the hazards identified by the Rowan University Working Group in Part 3.2. The information represented by these maps was used in the Critical Facilities Hazard Exposure Assessment described in Part 3.4.

Table GC.26-4: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.D-11	Dam Failure	Dam Locations and Hazard Classification	Identify areas in proximity to rated dams
Figure RP.D-46	Flood	FEMA Flood Hazard Zones Preliminary FIRM (PFIRM)	Identify areas subject to periodic flooding (work-in-progress for revisions to effective FIRM)
Figure RP.D-54	Flood (Storm Surge) ¹⁷	Coastal Flood Loss Atlas – SLOSH Model Maximum of Maximum	Identify areas where inundation due to storm surge may occur

The following hazards are not referenced as these hazards occur uniformly across the region and have the same potential impact on all properties and assets:

- Drought
- Earthquake
- Extreme Temperatures – Cold and Hot
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

- *Inventory information for University critical facilities*
- *Hazard exposure analysis results for University critical facilities*

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table GC.26-5 contains updated inventory information for Rowan University critical facilities including cross-references to related mitigation measures identified in Part 4 of the Rowan University Appendix.

Table GC.26-6 contains results of overlaying critical facility locations with hazard mapping identified in Part 3.3. The results indicate critical facilities that are potentially exposed to specific hazards. This information is displayed in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan and will be used in critical site and facility assessments to be conducted as part of Mitigation Measure M-2 (see Part 4 of the Rowan University Appendix).

Hazards that apply to all critical facilities in the NJ4 region and will automatically be included in the proposed critical site and facility assessment process include:

- Earthquake
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Hazards that do not relate to the proposed critical site and facility assessment process include:

- Drought
- Extreme Temperatures – Cold and Hot

As a result, these six (6) hazards are not included in the critical facility exposure assessment in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan.

Part 3: Hazard Identification and Risk Assessment

Table GC.26-5: Rowan University (Gloucester County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Main Campus Primary Emergency Operations Center	EOC	Co-located Facility	Bole Annex, Glassboro		N/A	Y ¹³		
CF-2	Main Campus Secondary Emergency Operations Center	EOC	Co-located Facility	Memorial Hall, Room 194, Glassboro		N/A	Y ¹⁴		
CF-3	Cooper School of Medicine Emergency Operations Center	EOC	Co-located Facility	CMSRU, 401 S. Broadway, Room 194, Camden		N/A	Y ¹⁵		
CF-4	School of Osteopathic Medicine Emergency Operations Center	EOC	Co-located Facility	Rowan SOM Academic Center, Dean's Large Conference Room, Stratford		N/A	Y ¹⁵		
CF-5	Main Campus Gymnasium and Recreation Center	Campus Facilities	Recreation Centers	Gymnasium and Recreation Center, Glassboro		Y ¹⁶	Y ¹⁷		
CF-6	Main Campus Data Center	Campus Facilities	Administrative Facilities – Data Center	Library, Glassboro		N/A	Y ¹⁵		
CF-7	Main Campus Data Center	Campus Facilities	Administrative Facilities - Data Center	Memorial Hall, Glassboro	CF-2				
CF-8	Main Campus Research Centers (Vivarium)	Campus Facilities	Research Facilities	Glassboro		N/A	Y ¹⁵		

¹³ Back-up emergency power provided by generator and Rowan University Co-Generation Plant.

¹⁴ Back-up emergency power provided by Rowan University Co-Generation Plant

¹⁵ Existing generator provides back-up emergency power for life safety (e.g., emergency lighting).

¹⁶ Work-in-progress for Agreement with NJ OHS&P to use the Recreation Center and Gymnasium as a Regional Shelter with a maximum capacity = 500 with up to 25 AFN individuals.

¹⁷ Gymnasium is critical function for sheltering supported by back-up emergency power generator for life safety and is supported by co-generation plant as well as generator that can be provided by Gloucester County Office of Emergency Management / Recreation Center is supported by back-up emergency power generator

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-9	Main Campus – Steam Plant	Campus Facilities	Power and Heat Co-Generation	Glassboro		N/A	Y ¹⁸		
CF-10	Various Facilities	Campus Facilities	Classrooms and Offices	Glassboro			Y ¹⁹		
CF-11	Academic Center at Camden	Campus Facilities	Classrooms and Offices	129 North Broadway, Camden		N/A	N		
CF-12	Cooper School of Medicine	Campus Facilities	Classrooms and Offices	401 South Broadway Avenue, Camden		N/A	Y ²⁰		
CF-13	School of Osteopathic Medicine University Educational Center	Campus Facilities	Classrooms and Offices	40 East Laurel Road, Stratford		N	N		
CF-14	School of Osteopathic Medicine University Academic Center	Campus Facilities	Classrooms and Offices	1 Medical Center, Stratford		N	Y ²¹		
CF-15	School of Osteopathic Medicine University Science Center	Campus Facilities	Classrooms and Offices	1 Medical Center, Stratford		N	Y ²²		
CF-16	School of Osteopathic Medicine University Doctor's Pavilion	Campus Facilities	Classrooms and Offices	40 East Laurel Road, Stratford		N	Y ²³		

¹⁸ Critical function produces power and heat and cooling for most of Main Campus. Black start capability emanates from this building. Black start capability capacity equal to 60% of university demand. Facilities & Operations can prioritize the specific buildings.

¹⁹ Back-up emergency power for James Hall, Parking Garage, Robinson, Rowan Hall, Student Center, Savitz, Science Hall, Tech Park Triad, and Willow provided by Rowan University Co-Generation Plant

²⁰ Two (2) existing generators are capable of supporting emergency lighting, air handling and essential equipment such as fire pumps.

²¹ Existing generator capable of running emergency lighting.

²² Two (2) existing generators capable of running emergency lighting and boiler.

²³ Existing generator capable of running emergency lighting and boiler.

Part 3: Hazard Identification and Risk Assessment

Table GC.26-6: Rowan University (Gloucester County) Critical Facilities Hazard Exposure²⁴

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Main Campus Primary Emergency Operations Center	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-2	Main Campus Secondary Emergency Operations Center	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-3	Cooper School of Medicine Emergency Operations Center	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-4	School of Osteopathic Medicine Emergency Operations Center	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-5	Main Campus Gymnasium and Recreation Center	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-6	Main Campus Data Center	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-7	Main Campus Data Center	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-8	Main Campus Research Centers (Vivarium)	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-9	Main Campus – Steam Plant	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-10	Various Facilities	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-11	Academic Center at Camden				N/A								N/A	N/A	N/A

²⁴ **Note to Draft NJ4 HMP Reviewers:** Results for the Critical Facility Hazard Exposure Analysis for all hazards will be included in the Final Rowan University Appendix. These results will not alter the existing mitigation measures in Part 4 of this Appendix but will be the basis for the site and facility assessments to be undertaken by the University under Mitigation Measure M-2.

Part 3: Hazard Identification and Risk Assessment

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.2%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-12	Cooper School of Medicine				N/A								N/A	N/A	N/A
CF-13	School of Osteopathic Medicine University Educational Center	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-14	School of Osteopathic Medicine University Academic Center	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-15	School of Osteopathic Medicine University Science Center	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-16	School of Osteopathic Medicine University Doctor's Pavilion	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A	N/A	N/A	N/A	N/A

Part 4: Mitigation Measures

Part 4.1: Mitigation Goals and Strategy

Part 4.1 includes:

- *Goal statements reviewed and approved by the Rowan University Working Group based on goals included in the Southern Delaware Valley Region (New Jersey) Multi-Jurisdictional Hazard Mitigation Plans (SDVR HMPs) approved by FEMA in 2010 and 2011 for Camden, Cumberland, Gloucester, and Salem Counties*
- *Overarching strategy for the university's mitigation program*

Goals were originally established by the Southern Delaware Valley Region Hazard Mitigation Steering Committee and validated by the four County Hazard Mitigation Working Groups in response to risk and capability assessment results.

As part of the plan update process, these goals were reviewed and edited by the Working Group for use in the Rowan University Appendix. All mitigation measures in the Appendix are related to at least one of these four goal statements.

- **Goal 1: Improve education and outreach efforts** regarding potential risk of natural hazards and appropriate mitigation measures that can be used to reduce risk (including programs, activities, and projects)
- **Goal 2: Improve data collection, use, and sharing** to reduce the risk of natural hazards
- **Goal 3: Improve capabilities and coordination** to plan and implement hazard mitigation measures
- **Goal 4: Plan and implement projects** to mitigate identified natural hazards, known problems, and areas of concern

Based on these goals, the results of the NJ4 HMP Regional Hazard Mitigation Plan HIRA, and experience of participants in the plan update process, the Rowan University Working Group identified an overarching strategy for mitigation:

- Seek long-term, comprehensive, and balanced protection from flood threats for university assets including addressing stormwater runoff from neighboring communities and developments
- Continue to address short-term needs to resolve flooding and drainage problems that threaten existing and planned assets such as recently completed \$500,000 project to resolve stormwater management improvements in the vicinity of Linden and Memorial Halls
- Focus on projects to address known problems or areas of concern for critical facilities and vulnerable populations as initial risk reduction efforts
- Identify additional areas of concern for critical facilities and vulnerable populations for future plan updates
- Provide opportunities for the university community to access available information about risk reduction and mitigation measures
- Institutionalize hazard mitigation into university activities and programs through regular interactions of the Rowan University Working Group and better integration of related programs and planning initiatives
- Stay informed regarding changing conditions and related improvements in hazard and risk data due to future natural hazard events and increasing understanding of the effects of climate change and use the information as part of periodic evaluations of and refinements or additions to the university's mitigation program

Part 4: Mitigation Measures

The mitigation measures described in Parts 4.3 through 4.5 of the Rowan University Appendix reflect this strategy.

Part 4.2: SDVR HMP Mitigation Measures

Part 4.2 includes the status of mitigation measures identified for the university in the SDVR HMP.

Known problems and areas of concern were the basis for mitigation measures identified in the SDVR HMP. In cases where these problems and concerns still existed at the time of the plan update, the related SDVR HMP mitigation measures were candidates for inclusion in the Rowan University Appendix.

Table GC.26-7 identifies the status of mitigation measures included in the SDVR HMP. These entries were based on information provided by the Rowan University Working Group. In some cases, the SDVR HMP mitigation measures were carried over as part of the Rowan University Appendix as indicated in the "Comments" column and the far right-hand column of Table GC.26-7.

Table GC.26-7: Status of Rowan University (Gloucester County) SDVR HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # (Notes A & B)
Rowan University 1: Floodproofing, improved conveyance, and drainage of shelter in Recreation Center.	On-going.	Floodproofing measures were installed but did not completely resolve flooding problems. Options will be identified as part of Rowan University Stormwater Management Landscape Master Plan. Revised mitigation measure included in updated Rowan University Appendix.	MJ-2
Rowan University 2: Construct bulkhead, improve retention, and conveyance of Chestnut Branch Creek.	On-going.	Revised mitigation measure included in updated Rowan University Appendix.	MJ-4
Rowan University 3: Improve drainage of Triad Apartments and Bunce Academic Building.	On-going.	Drainage improvements completed but did not completely resolve flooding problems. Runoff from neighboring developed areas is the main source of the excess stormwater. Rowan University is working the Glassboro Borough to resolve. Revised mitigation measure included in updated Rowan University Appendix.	MJ-1
Rowan University 4: Initiatives to evaluate lock down processes, evacuation procedures, emergency communications, and other Homeland Security initiatives relating to campuses.	Completed.	These initiatives were incorporated into the 2013 update of the Rowan University Emergency Operations Plan.	

Table GC.26-7 Notes:

- A. See Tables GC.26-8 and GC.26-9 for Rowan University (M-#) mitigation measures
- B. See Table GC.26-10 for multi-jurisdictional (MJ-#) mitigation measures

Part 4: Mitigation Measures

Part 4.3: Mitigation Measures – Identification

Part 4.3 includes brief descriptions of mitigation measures that are considered the sole responsibility of the university.

Table GC.26-8 includes the list of mitigation measures that are considered the responsibility of the university. These mitigation measures:

- Reflect the goals and strategy identified in Part 4.1
- Include projects carried over from SDVR HMPs as detailed in Part 4.2
- Include new projects, programs or activities identified by the Rowan University Working Group including measures to address known problems or areas of concern for critical facilities and vulnerable populations

Table GC.26-8 includes:

- Brief description of the mitigation action, program or project
- Hazard(s) addressed by the measure
- Relevant goal(s) addressed by the measure
- Whether the measure pertains to existing or new structures or both

Table GC.26-8: Rowan University (Gloucester County) Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	Identify and pursue outreach and education opportunities to inform students, staff, and faculty regarding: <ul style="list-style-type: none">• Current hazards and risks• Changing conditions and actions that may reduce / increase risk• Best practices for hazard mitigation at the individual or facility level.	All	Goal #1	Both
M-2	As part of established Facilities Conditions Audits, prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	All	Goal #2	Existing
M-3	Conduct regular Working Group meetings consistent with the plan maintenance program and the Adoption Resolution.	All	Goal #3	Both
M-4	Install campus-wide surveillance camera system	All	Goal #4	Both
M-5	Alleviate ground water infiltration in steam distribution system manholes.	Flooding	Goal #4	Existing
M-6	Alleviate flooding at College of Osteopathic Medicine parking lot.	Flooding	Goal #4	Existing
M-7	Install Fuel Containment at Fueling Station for Campus Vehicles	Flooding ¹	Goal #4	Existing

¹ Mitigation Measure identified as a result of December 1, 2014 Public Meeting to address potential contamination of waterways if the fueling station area were flooded.

Part 4: Mitigation Measures

Part 4.4: Mitigation Measures – Implementation

Part 4.4 includes a tabulation of relevant aspects related to the implementation of the university's mitigation measures.

Table GC.26-9 includes information identified by the Rowan University Working Group:

- Part(ies) responsible for following up with implementation of the measure
- Priority for implementation considering a range of criteria²
- Project Type to help determine funding options and implementation mechanisms at the university³
- Estimated Cost, including estimates provided by the Working Group or approximate ranges for projects that are in early stages of development
- Target Date, indicating desired completion dates assuming availability of funding
- Next step(s) anticipated to implement the identified mitigation measures at the university

Table GC.26-9: Rowan University (Gloucester County) Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Identify and pursue outreach and education opportunities.	Rowan University OEM	High	Public Outreach and Education	Staff time commitment	On-going	<ul style="list-style-type: none"> ▪ Work with County Working Group to identify resource needs and availability. ▪ Identify target audience(s).
M-2	Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.	Rowan University Facilities and Operations and Facility Managers	High	Data Acquisition and Management	Staff time commitment	On-going	Review critical facility list and establish priorities, procedures, and tentative time schedule for conducting site and facility surveys.
M-3	Conduct regular Working Group meetings.	Rowan University OEM and Working Group	Moderate	Capabilities and Coordination	Staff time commitment	On-going	Establish regular Rowan University Working Group membership, reporting requirements, and meeting / work session schedule.
M-4	Install campus-wide surveillance camera system	Rowan University Public Safety and Rowan University Information Systems	High	Security Systems	\$3.5M ⁴	Completion by 2016	Proceed with procurement process.

² See *Section 4: Mitigation Measures* and related portions of Annex E of the NJ4 HMP Regional Hazard Mitigation Plan for a description of evaluation criteria considered by the Rowan University Working Group.

³ See *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan for a description of project types and related information regarding funding options and implementation mechanisms.

⁴ Cost estimate provided by Rowan University OEM.

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-5	Alleviate ground water infiltration in steam distribution system manholes.	Rowan University Facilities and Operations	Moderate	Utility Retrofits	\$150K ⁵	On-going.	On-going.
M-6	Alleviate flooding at College of Osteopathic Medicine parking lot.	Rowan University Facilities and Operations	Low	Public Property Flood Mitigation	To be determined.	To be determined.	Conduct project scoping.
M-7	Install Fuel Containment at Fueling Station for Campus Vehicles	Rowan University Facilities and Operations	Moderate	Public Property Flood Mitigation	\$50K	Three –five years	Conduct project scoping.

Part 4.5: Multi-Jurisdictional Mitigation Measures

Part 4.5 includes brief descriptions of mitigation measures that require multiple jurisdictions to implement.

During the Rowan University Working Group Work Sessions, the Working Group identified some SDVR HMP mitigation measures as well as new areas of concern as mitigation measures where implementation requires participation or leadership from other levels of government, including county, state, and federal agencies. These multi-jurisdictional mitigation measures are included in Table GC.26-10.

Section 4: Mitigation Measures of the NJ4 HMP Regional Hazard Mitigation Plan describes multi-jurisdictional implementation strategies in detail. Section 4 identifies multi-jurisdictional mitigation measures that Working Groups believe are partly or wholly the responsibility of County agencies. These measures have been referred to the County Working Group for consideration. As part of the mitigation measures in the County Appendix to the NJ4 HMP Regional Hazard Mitigation Plan, the County Working Group will be working to identify:

- Specific responsibilities amongst different level(s) of government to address these problem areas
- Mitigation measures or related projects which may address the described problem areas that are already acknowledged as County responsibilities including identifying the appropriate County agency or department taking the lead role and status of implementing these mitigation measures
- Which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

Table GC.26-10: Rowan University (Gloucester County) Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-1	Alleviate flooding at Triad Hall Apartments (pending recommendations in Rowan University SWM Master Plan).	Flooding	Goal #4	Existing	Rowan University Facilities and Operations, Glassboro Borough	High

⁵ Cost estimate provided by Rowan University Facilities and Operations based on an estimated quantity of 15 manholes and an estimated cost per manhole of \$10,000.

Part 4: Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
MJ-2	Alleviate flooding from Carpenter Street at Recreation Center (pending recommendations in Rowan University SWM Master Plan).	Flooding	Goal #4	Existing	Rowan University OEM, Glassboro Borough, Gloucester County	High
MJ-3	Alleviate flooding at Chestnut Hall and EPA Parking Lot (pending recommendations in Rowan University SWM Master Plan).	Flooding	Goal #4	Existing	Rowan University OEM, Glassboro Borough, Gloucester County	High
MJ-4	Improve conveyance and retention in Chestnut Branch Creek and S-Curve Road.	Flooding	Goal #4	Existing	Rowan University OEM, Glassboro Borough, Gloucester County	High
MJ-5	Continue on-going discussions with Glassboro Borough to identify potential watershed improvements to reduce storm water inflow and/or increase storm water outflow from Rowan University Main Campus	Flooding	Goal #s 2, 3, and 4	Existing	Rowan University Facilities and Operations, Glassboro Borough, Gloucester County, New Jersey	High

Part 4.6: Plan Review and Integration

Part 4.6 includes:

- *Cross references to relevant information and recommendations in the NJ4 HMP Regional Hazard Mitigation Plan regarding improving capabilities and coordination at the university*
- *Plans and programs included in the development of Plan Integration recommendations in the NJ4 HMP Regional Hazard Mitigation Plan*

The update of the SDVR HMP included reexamining Rowan University hazard mitigation capabilities; potential for improving capabilities and coordination within and between jurisdictions; and, plan integration considerations. *Section 4: Mitigation Measures* and related portions of Annex F of the NJ4 HMP Regional Hazard Mitigation Plan include summary observations and recommendations concerning:

- Hazard mitigation planning and mitigation measure implementation capabilities at the regional, county, and municipal levels
- Coordination within governments, between governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- Integration of hazard mitigation data, goals, measures, and/or recommendations with existing plans and programs

Specific documents obtained during the plan update process from the Rowan University Working Group that were incorporated into these observations and recommendations regarding plan integration include:

- Rowan University Emergency Operations Plan (2013)
- Rowan University Campus Master Plan (2013)
- County and municipal Master Plans
- County and municipal Stormwater Management Plans

Attachment A: Public Review Comments

The following comments were received during the public review of the Rowan University Appendix:

Table GC.26.A-1: Public Review Comments

Comment Date and Time	Comment	Response
November 30, 2014 @ 9:53 am	Suggested restoration of natural waterways as a way to alleviate flooding problems on the Main Campus.	On-going efforts to develop the Rowan University Stormwater Management Landscape Master Plan are considering naturalized waterways and stormwater management techniques.
December 1, 2014 (@ Rowan University Public Meeting)	Suggested tracking pot holes and filling in certain parking areas.	Rowan University is planning on demolishing the parking lot referenced in this comment for planned capital improvements.
December 1, 2014 (@ Rowan University Public Meeting)	Suggested improvement of containment surrounding Rowan University refueling station.	Suggestion incorporated into Draft Appendix as Mitigation Measure M-7.

Note: As of April 17, 2015, no other public review comments were received for the Rowan University Appendix.

