



Cumberland County Multi-Hazard Mitigation Plan Update  
**Participating Jurisdiction Appendices**

**Appendix 1**  
**Cumberland County, New Jersey**

August 22, 2022

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## Part 1: Overview

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### Part 1.1: Cumberland County Multi-Hazard Mitigation Plan Update

The Cumberland County Multi-Hazard Mitigation Plan Update (CC HMPU) incorporates input from all 15 participating jurisdictions in Cumberland County, including Cumberland County and 14 separate municipalities.

The CC HMPU is an update of the Mitigation Plan for Four New Jersey Counties (NJ4 HMP) that was completed by all fifteen jurisdictions in Cumberland County along with over 70 additional jurisdictions from Camden, Gloucester, and Salem Counties. The Cumberland County portions of the NJ4 HMP were adopted by the participating jurisdictions and approved by the Federal Emergency Management Agency in 2016.

The CC HMPU has two main parts:

- Cumberland County Multi-Hazard Mitigation Plan Update, or the “Base Plan”.
- County and Municipal Appendices.

The Base Plan includes descriptions and information common to all 15 participating jurisdictions organized according to the following three focus areas:

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

The County and Municipal Appendices include specific information for these same three focus areas for each of the 15 participating jurisdictions. Detailed tabulations are included in these Municipal Appendices for critical facilities, the status of past mitigation activities, and proposed mitigation measures for each municipality.

### Part 1.2: Cumberland County Appendix

This County Appendix is focused on Cumberland County, New Jersey.

The Cumberland County Working Group developed the Cumberland County Appendix for adoption by the Cumberland County Board of County Commissioners and subsequent approval by Region II of the Federal Emergency Management Agency.

## 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 1-1 identifies the County Working Group members. As detailed in *Section 2: Planning Process* of the Base Plan, the County Working Group is comprised of representatives who worked to make sure mitigation measures included in the County Appendix addressed the risks faced by residents, businesses, and property owners and reflected the priorities of the County as a whole.

County Working Group members reviewed briefing materials and contributed during Work Sessions and Meetings and reviewed the Preliminary Draft and Public Review Draft versions of the CC HMPU Base Plan and Appendices. The Working Group will also continue to stay involved during the implementation and maintenance of the CC HMPU.

Due to the on-going COVID-19 pandemic during the plan update process, Working Group meetings were conducted in a variety of ways including virtual meetings. However, when local conditions permitted, in-person meetings were conducted.

*Note: Five members of the Working Group also participated in the development of the 2016 NJ4 HMP. These members are indicated with an (\*) following their last names.*

**Table 1-1: Cumberland County Working Group**

First Name	Last Name	Department	Position	Project Kickoff Meeting <sup>1</sup>	Round 1 Work Session <sup>2</sup>	Round 2 Work Session <sup>3</sup>	Contribution <sup>4</sup>
Gabriel	Scarpa	Office of Emergency Management (OEM)	OEM Coordinator (through September 2021) / Director (as of October 2021)	☑	☑		
Bryan	Everingham	OEM	Confidential Assistant (through September 2021) / OEM Coordinator (as of October 2021)	☑	☑	☑	
James	Manski *	OEM	Deputy OEM Coordinator	☑	☑	☑	Organized Working Group and Work Sessions.

<sup>1</sup> Project Kickoff Meeting was held on May 20, 2021.

<sup>2</sup> Round 1 Work Session was held on July 28, 2021.

<sup>3</sup> Round 2 Work Session was held on November 23, 2021.

<sup>4</sup> Additional or unusual contributions are noted in the far-right hand column.

## Part 2: Participation

First Name	Last Name	Department	Position	Project Kickoff Meeting <sup>1</sup>	Round 1 Work Session <sup>2</sup>	Round 2 Work Session <sup>3</sup>	Contribution <sup>4</sup>
Melinda	Weisgerber *	OEM	Confidential Assistant	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Matt	Witta	OEM	Deputy OEM Coordinator	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
William	Mosley	OEM	Communications Systems Technician II	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Kimberly	Wood *	Department of Administration	County Administrator				
Jody	Hirata	Department of Administration	Deputy County Administrator				
Neil	Riley	Department of Public Works and Public Property	Director			<input checked="" type="checkbox"/>	
Douglas	Whitaker *	Department of Engineering	County Engineer		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
James	Neher	Department of Public Works and Public Property	Assistant Director of Public Works		<input checked="" type="checkbox"/>		
Matt	Pisarski	Planning Department	Planning Director		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Joseph	Zaccaria	Planning Department	GIS Specialist		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Matthew	Jones	Sherriff's Department	Sergeant / OEM Liaison			<input checked="" type="checkbox"/>	
Joseph	Sever *	N/A	Private Citizen		<input checked="" type="checkbox"/>		Former OEM Coordinator during NJ4 HMP development

## Part 2: Participation

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The following lists candidate positions and organizations within the community that were extended invitations 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.

- Board of Commissioners
- EMS Coordinator
- Fire Coordinator
- Fire Marshall
- Improvement Authority
- Chambers of Commerce
- Soil and Water Conservation District
- County School Superintendent
- Long Term Healthcare Facilities (via regularly scheduled quarterly meetings)

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 the community. 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 Cumberland County so there are no parcels that could potentially be covered under the National Flood Insurance Program.
- County Volunteers Active in Disaster
- Cumberland County environmental organizations



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## Part 2: Participation

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### Part 2.2: Public Participation

Part 2.2 includes all 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 1-2 identifies the date, type of involvement, and location (where applicable) for all opportunities provided to the public and interested parties to participate in the development of the plan update.

**Table 1-2: Public Participation**

Date	Type of Involvement	Location
July 8, 2021	Link to Project Website <sup>5</sup> established and maintained.	County website <sup>6</sup>
July 28, 2021	Public meeting conducted with presentation and open discussion.	Virtual via MS Teams
September 8, 2021	Preliminary Draft County Appendix available for public comment.	Project Website <sup>5</sup>
September 8, 2021	Notice posted re: Preliminary Draft County Appendix review period with link to Project Website.	County website <sup>6</sup>
April 7, 2022	Notice posted re: Public Review Draft County Appendix review period with link to Project Website.	County website <sup>6</sup>
April 19, 2022	Public Review Draft County Appendix available for public comment.	Project Website <sup>5</sup>

Public comments and input received for the Preliminary Draft and Public Review Draft versions of the County Appendix were considered by the County Working Group and incorporated into the County Appendix where appropriate. In addition, the County Appendix was adopted as part of a regularly scheduled public meeting.

Public education and outreach is an on-going mitigation measure included in the County Appendix.<sup>7</sup> In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.<sup>8</sup>

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<sup>5</sup> <https://cchmpu21.com/documents>

<sup>6</sup> <http://www.co.cumberland.nj.us/OEM>

<sup>7</sup> See Mitigation Measure M-1 in Part 4 of the County Appendix.

<sup>8</sup> Public education and outreach is described in *Section 4: Mitigation Measures* of the CC HMPU Base Plan.

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## Part 3: Hazard Identification and Risk Assessment

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### Part 3: Hazard Identification and Risk Assessment

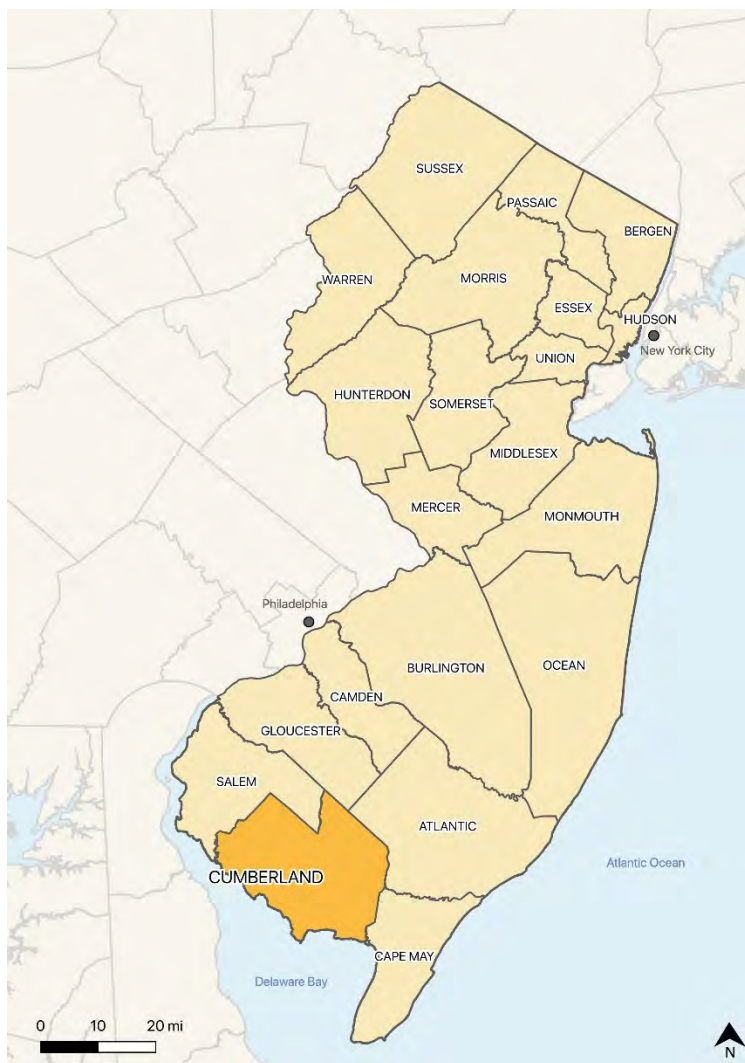
Part 3 includes seven subparts:

- *Part 3.1: Profile*
- *Part 3.2: General Building Stock*
- *Part 3.3: Critical Facilities*
- *Part 3.4: Hazard Exposure Assessment*
- *Part 3.5: Demographic Considerations*
- *Part 3.6: Observations*
- *Part 3.7: Hazard Priorities*

#### Part 3.1: Profile

Cumberland County is located in southwest New Jersey along the Delaware Bay and bordered by Gloucester and Salem Counties to the north, Atlantic County to the northeast, and Cape May County to the southeast (See Figure 1-1).

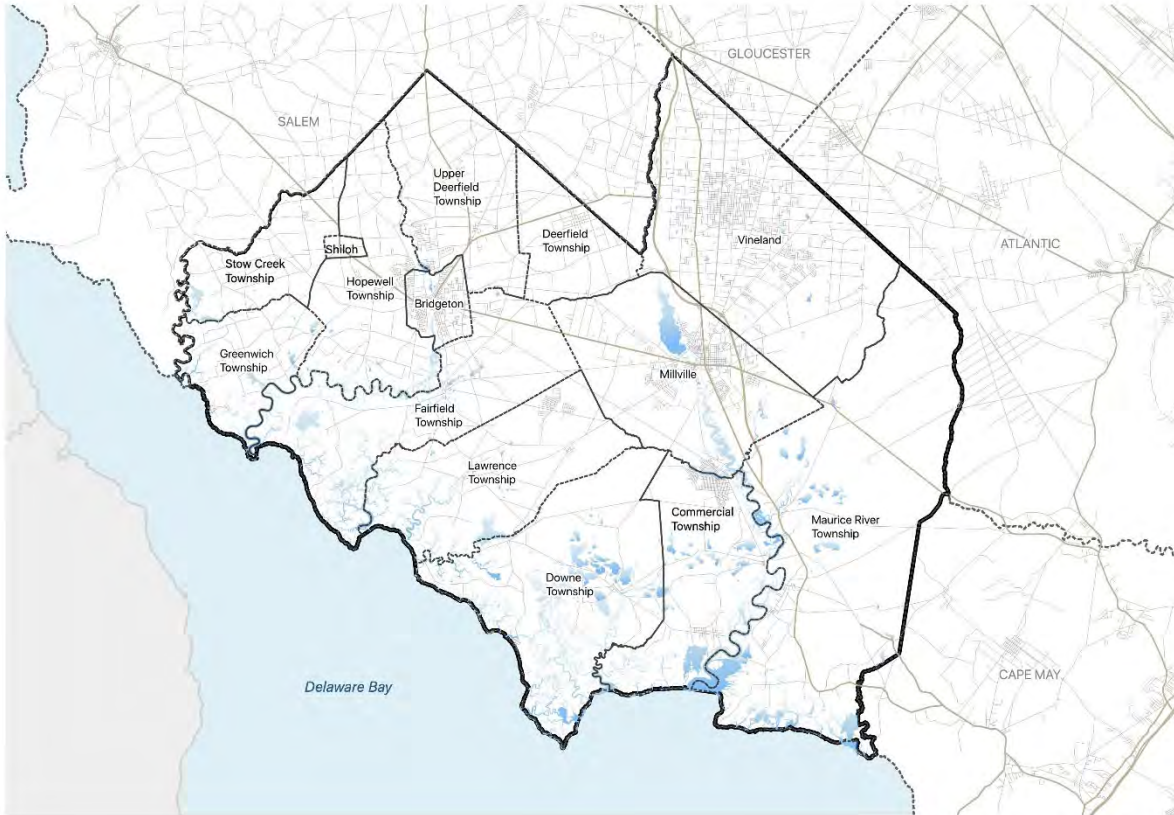
**Figure 1-1: Cumberland County Location Map**



### Part 3: Hazard Identification and Risk Assessment

Per Figure 1-2, major water courses include the Delaware Bay which forms the southern boundary, Stow Creek which forms much of the boundary between Cumberland and Salem Counties, the tidal Cohansey and Maurice Rivers and Union Lake in Millville City which formed by a large dam on the upper reaches of the Maurice River. Major transportation routes include New Jersey Routes 47, 49, and 55. The land is predominantly flat including large areas of salt marsh and wetlands along the bay shore with the highest elevation only 140 feet above sea level.

**Figure 1-2: Cumberland County Base Map**



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### Part 3: Hazard Identification and Risk Assessment

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Figure 1-2 also shows the 14 cities, townships, and boroughs that are located within Cumberland County. Like the other three counties in the region, Cumberland County includes communities influenced by their proximity to the Delaware Bay as well as inland municipalities although the influence of the bay on the development patterns in Cumberland County municipalities is more pronounced than in Gloucester and Camden Counties:

- Bridgeton City
- Commercial Township
- Deerfield Township
- Downe Township
- Fairfield Township
- Greenwich Township
- Hopewell Township
- Lawrence Township
- Maurice River Township
- Millville City
- Shiloh Borough
- Stow Creek Township
- Upper Deerfield Township
- Vineland City

All 14 Cumberland County municipalities participated in the CC HMPU planning process. Individual information for each of these participating jurisdictions can be found in their respective Appendices.<sup>9</sup>

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<sup>9</sup> See Appendices 2 through 15.

Part 3.2: General Building Stock

As of 2015, there are 67,045 buildings in Cumberland County with a total assessed value of improvements of \$8,922,929,128. Figure 1-3 shows an example from the Bridgeton City Municipal Appendix illustrating the level of detail shown for the footprints of these buildings.

Figure 1-3: Bridgeton City Building Footprints<sup>10</sup>

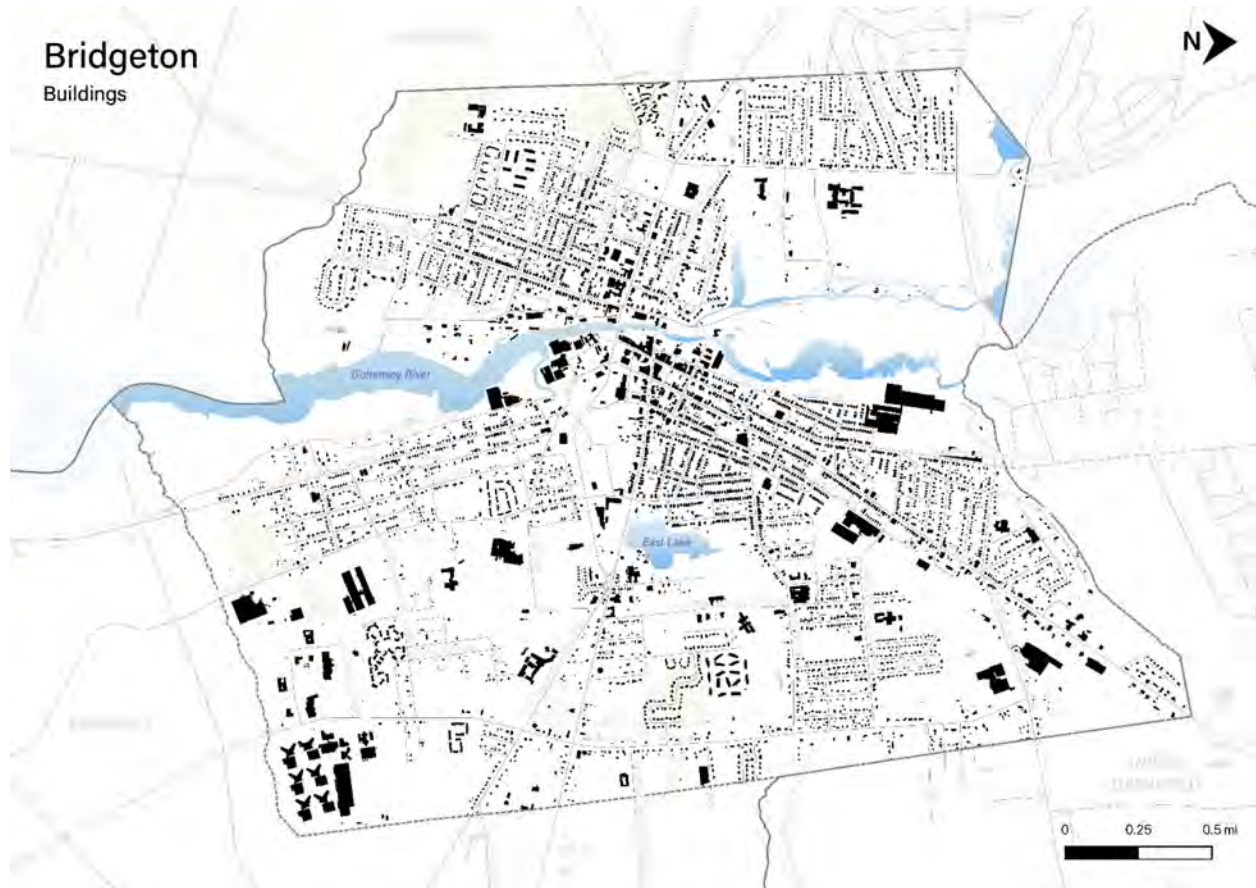


Table 1-3 shows the distribution of these structures according to land use distinctions.

Table 1-3: Cumberland County Buildings per Land Use Type<sup>11</sup>

Land Use Type	Residential	Commercial	Industrial	Other
Number of Buildings	50,168	5,594	647	8,100
% of Total	78%	9%	1%	12%

<sup>10</sup> Building footprint data was isolated from “Impervious Surfaces” data (2015) per <https://gisdata-njdep.opendata.arcgis.com/>. Note: This (map/publication/report) was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized or endorsed.

<sup>11</sup> Land use types were isolated from MOD-IV Parcels and Tax Assessor data composite (2021) per <https://njogis-newjersey.opendata.arcgis.com/documents/parcels-and-mod-iv-of-cumberland-county-nj-shp-download/about> from the New Jersey Office of GIS.

## Part 3: Hazard Identification and Risk Assessment

### Part 3.3: Critical Facilities<sup>12</sup>

As of April 2022, there are twenty-nine (29) critical facilities in Cumberland County.

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.

Table 1-4 includes current inventory information for county critical facilities and includes cross-references to related mitigation measures identified in Part 4 of the County Appendix. Figure 1.4 shows the location of these critical facilities.

**Table 1-4: Cumberland County Critical Facilities Inventory**

#	Name	Type	Subtype	Jurisdiction	Owner / Operator	Address	Shelter (Y/N)	Generator (Y/N)	Other?
CF-1	Cumberland County Sheriff's Department	Law Enforcement Facilities	Administrative Offices	Bridgeton City	Cumberland County Sherriff's Department	220 North Laurel Street, Bridgeton	N	Y	
CF-2	Cumberland County Prosecutor's Office	Law Enforcement Facilities	Administrative Offices	Bridgeton City	Cumberland County Prosecutor's Office	115 Vine Street, Bridgeton	N	Y	
CF-3	Cumberland County Public Works Facility #2	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	Bridgeton City	Cumberland County Department of Public Works	800 East Commerce Street, Bridgeton	N	Y	
CF-4	Cumberland County Tax Board and Superintendent of Schools	Municipal	Administrative Offices	Bridgeton City	Cumberland County Board of Freeholders	43 Fayette Street, Bridgeton	N	N	

<sup>12</sup> Critical facility definitions and considerations are described in *Section 3: Hazard Identification and Risk Assessment* of the CC HMPU Base Plan.

**Part 3: Hazard Identification and Risk Assessment**

#	Name	Type	Subtype	Jurisdiction	Owner / Operator	Address	Shelter (Y/N)	Generator (Y/N)	Other?
CF-5	Cumberland County Department of Human Services	Municipal	Administrative Offices	Bridgeton City	Cumberland County Board of Freeholders	70-74 Broad Street, Bridgeton	N	N	
CF-6	Cumberland County Administrative Offices	Municipal	Administrative Offices	Bridgeton City	Cumberland County Board of Freeholders	164 West Broad Street, Bridgeton	N	Y	
CF-7	Cumberland County Jail	Law Enforcement Facilities	Correctional Facility	Bridgeton City	Cumberland County Department of Corrections	54 West Broad Street, Bridgeton	N	Y <sup>13</sup>	
CF-8	Cumberland County Public Works Facility #1	Public Works	Combined Administrative Office, Maintenance / Work Areas, and Equipment / Material Storage,	Commercial Township	Cumberland County Department of Public Works	North Avenue, Port Norris	N	N	
CF-9	Cumberland County EOC and 911 Communications Center	Communications	Co-located 911 Communications / Dispatch Centers	Deerfield Township	Cumberland County Department of Emergency Services	637 Bridgeton Avenue, Bridgeton	N	Y	
CF-10	4-H Extension Center	Municipal	Meeting Space	Deerfield Township	Rutgers University Cooperative Extension	291 Morton Avenue, Millville	N	N	
CF-11	Cumberland County Fire / Rescue Training Academy	Schools	Public Training Center	Deerfield Township	Cumberland County Department of Emergency Services	601 Vineland Avenue, Bridgeton	Y	N	C-POD site and emergency worker shelter

<sup>13</sup> Existing back-up emergency power generator limited to emergency lighting.

**Part 3: Hazard Identification and Risk Assessment**

#	Name	Type	Subtype	Jurisdiction	Owner / Operator	Address	Shelter (Y/N)	Generator (Y/N)	Other?
CF-12	CCIA Solid Waste Complex	Utilities – Solid Waste	Landfill / Transfer Station	Deerfield Township	Cumberland County Improvement Authority	169 Jesse Bridge Road Millville,	N	Y	
CF-13	Cumberland County Building and Grounds Maintenance Facility and Emergency Communications Center (and Communications Tower)	Public Works	Combined Administrative Offices, Maintenance / Work Areas, and Equipment / Material Storage	Hopewell Township	Cumberland County Department of Buildings and Grounds	189 Trench Road, Bridgeton	N	N	
CF-14	Cumberland County Board of Elections	Municipal – Other	Administrative Offices	Hopewell Township	Cumberland County Board of Elections	555 Shiloh Pike, Bridgeton	N	Y	Back-up COG site
CF-15	Building 1”	Municipal	Administrative Offices	Hopewell Township	Cumberland County Department of Corrections	135 Sunny Slope Drive, Bridgeton	N	Y	
CF-16	Building 2	Municipal	Data Storage and Retrieval	Hopewell Township	Cumberland County Department of Administration, Property Division	135 Sunny Slope Drive, Bridgeton	N	N	
CF-17	Cumberland Fire Station and Communication Tower	FireStations	Station	Maurice River Township	Cumberland County Department of Emergency Services	5272 NJ Route 49, Millville	Y	Y <sup>14</sup>	
CF-18	CCIA Administrative Office	Utilities – Solid Waste	Administrative Offices	Millville City	Cumberland County Improvement Authority	2 N. High Street Millville	N	Y	

<sup>14</sup> 100 kW, diesel fuel.



**Part 3: Hazard Identification and Risk Assessment**

#	Name	Type	Subtype	Jurisdiction	Owner / Operator	Address	Shelter (Y/N)	Generator (Y/N)	Other?
CF-19	Cumberland County Public Works Facility #3	Public Works	Combined Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	Vineland City	Cumberland County Department of Public Works	1728 West Sherman Avenue, Vineland	N	Y <sup>15</sup>	
CF-20	Cumberland County College	Schools	Public Schools	Vineland City	Cumberland County College	3322 College Drive, Vineland	Y	Y <sup>16</sup>	
CF-21	Center Tower	Communications	Communications Tower	Deerfield Township	Cumberland County Department of Emergency Services	637 Bridgeton Avenue, Bridgeton	N/A	Y	
CF-22	Cumberland Tower	Communications	Communications Tower	Maurice River Township	Cumberland County Department of Emergency Services	5272 State Highway 49, Millville	N/A	Y	
CF-23	Hopewell Tower	Communications	Communications Tower	Hopewell Township	Cumberland County Department of Emergency Services	179 Trench Road, Bridgeton	N/A	Y <sup>17</sup>	
CF-24	Port Norris Tower	Communications	Communications Tower	Commercial Township	Cumberland County Department of Emergency Services	1800 North Avenue, Port Norris same as CF-10	N/A	Y	

<sup>15</sup> 100 kW, diesel fuel.

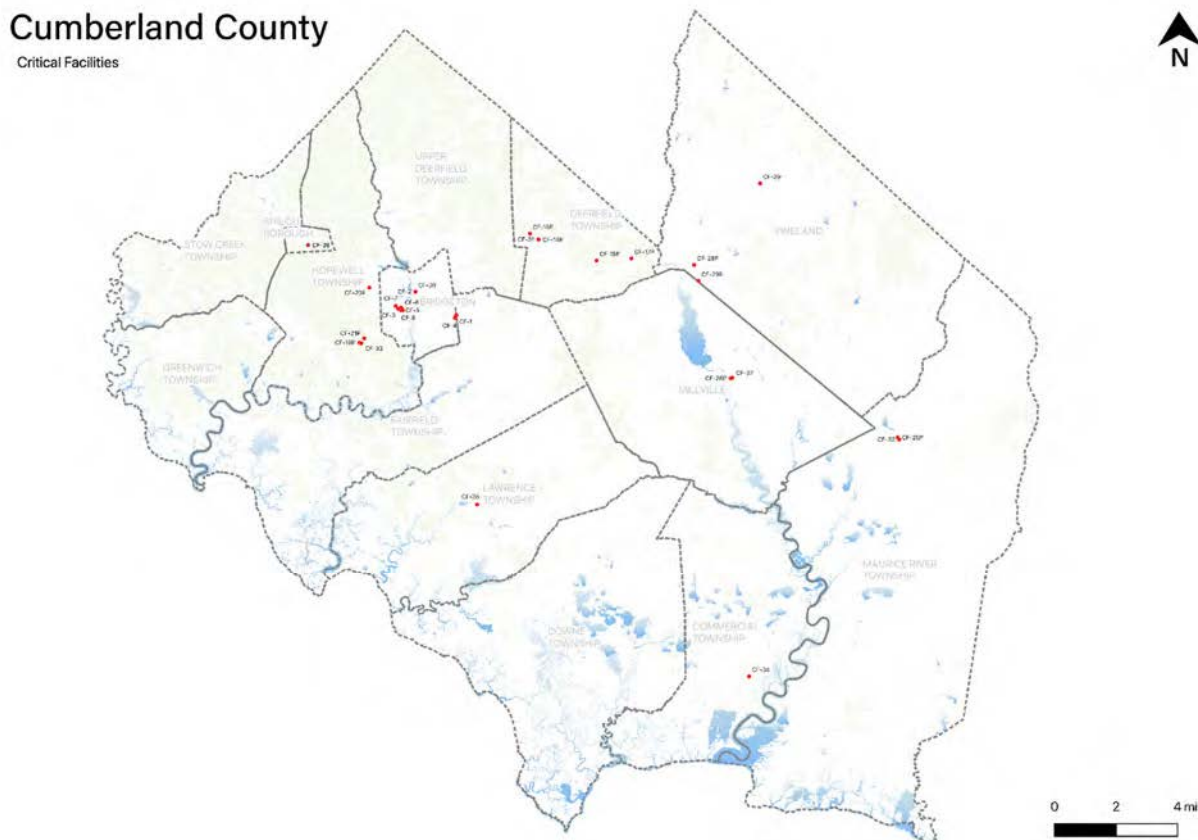
<sup>16</sup> Existing electrical systems were required for emergency operations.

<sup>17</sup> 80 kW, diesel fuel.

**Part 3: Hazard Identification and Risk Assessment**

#	Name	Type	Subtype	Jurisdiction	Owner / Operator	Address	Shelter (Y/N)	Generator (Y/N)	Other?
CF-25	Cedarville Tower	Communications	Communications Tower	Lawrence Township	Cumberland County Department of Emergency Services	30 Maple Avenue, Cedarville	N/A	Y	
CF-26	Sheriffs Tower	Communications	Communications Tower	Bridgeton City	Cumberland County Sheriff's Office	222 North Laurel Street, Bridgeton	N/A	Y	
CF-27	Millville Tower	Communications	Communications Tower	Millville City	Cumberland County Department of Emergency Services	122 East Main Street, Millville	N/A	Y	Located at Millville Housing Authority
CF-28	Vineland Tower	Communications	Communications Tower	Vineland City	Cumberland County Department of Emergency Services	640 East Wood Street, Vineland	N/A	Y	Located at City of Vineland Fire 1 Dispatch
CF-29	Shiloh Tower	Communications	Communications Tower	Shiloh Borough	Cumberland County Department of Emergency Services	900 Main Street, Shiloh	N/A	Y	Located at Shiloh Borough School Repeater

Figure 1-4: Cumberland County Critical Facilities



**Part 3.4: Hazard Exposure Assessment**

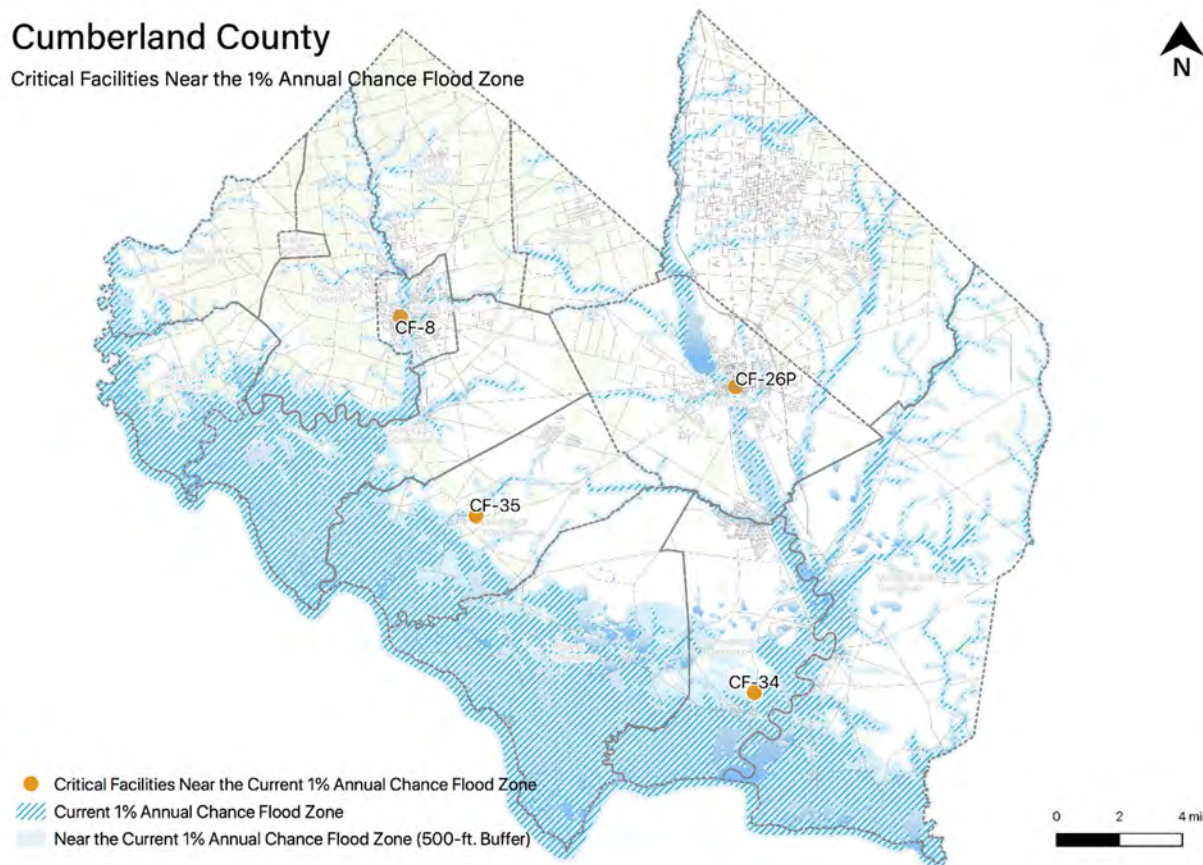
Hazard exposure assessments were completed for the eleven (11) natural hazards identified in the CC HMPU Base Plan<sup>18</sup>.

Key results for Cumberland County are depicted in the following.

Mapping: Figure 1-5 is illustrative of the type of mapping available as a result of the hazard exposure assessment. This figure shows critical facilities that are located in or near (i.e., within 500 feet) the 1% annual flood zone on FEMA’s Flood Insurance Rate Maps (FIRMs) or within a potential future 1% annual chance flood zone (i.e., within 1,000 feet).

<sup>18</sup> Hazard profiles are included for all eleven natural hazards in *Section 3: Hazard Identification and Risk Assessment* of the CC HMPU Base Plan.

Figure 1-5: Cumberland County Critical Facilities and 1% Annual Chance Flood Zone



Mapping results are available for general building stock and critical facilities for the following hazards:<sup>19</sup>

- Coastal Erosion & Sea Level Rise
- Earthquake
- Extreme High Temperature
- Flood - per FEMA flood hazard mapping
- High Wind and Severe Weather (heavy summer rains and winter snow loads)
- Wildfire

Tabulations: Selected data culled from the hazard exposure assessment process is displayed in the following tables:

- Table 1-5 indicates hazard exposure for general building stock
- Table 1-6 indicates hazard exposure for critical facilities

<sup>19</sup> All mapping corresponding to results described in Parts 3.3 through 3.5 can be viewed in .pdf format at: <https://www.dropbox.com/sh/yh4gwvyccwsgyh/AACS5yEJWHI82KKi4BJYFL8ta?dl=0>.

### Part 3: Hazard Identification and Risk Assessment

**Table 1-5: Cumberland County General Building Stock Hazard Exposure**

Hazard	Number of Exposed Buildings	Percent of Total Buildings in the Jurisdiction	Value of Exposed Buildings	Percent of Total Value in the Jurisdiction
Coastal Erosion <sup>20</sup>	6	-	\$254,300	-
Sea Level Rise - 3 feet increase	1,187	1.77%	\$83,233,793	0.93%
Flood - Within 1 % Annual Chance Zone	2,432	4%	\$209,840,477	2%
Flood - Near (within 500 feet) of 1% Annual Chance Zone	11,113	16%	\$1,411,460,381	16%
Earthquake – Structure built before 1927 <sup>21</sup>	12,156	22%	\$1,290,874,290	18%
High Winds / Severe Weather – Structure built before 1975	40,386	72%	\$4,452,858,554	61%
Wildfire – Composite score > 2.5 <sup>22</sup>	705	-	\$61,766,977	0.69%

**Table 1-6: Cumberland County Critical Facilities Hazard Exposure<sup>23</sup>**

Hazard	Number of Critical Facilities	CF #s
Coastal Erosion	None	N/A
Sea Level Rise	None	N/A
Flood - Within 1 % Annual Chance Zone	None	N/A
Flood - Near (within 500 feet) of 1% Annual Chance Zone	4	CF-7, CF-18, CF-24, CF-25
Flood – Future potential (within 1,000 feet) 1% Annual Chance Zone	7	CF-1, CF-4, CF-5, CF-11, CF-17, CF-26, CF-27
Wildfire	11	CF-3, CF-9, CF-10, CF-11, CF-17, CF-19, CF-20, CF-21, CF-22, CF-24, CF-25

In addition, all critical facilities in Cumberland County are exposed to the following hazards and potentially subject to power outages, and structural and/or contents damage:

- Earthquake
- Extreme Temperatures
- High Winds
- Severe Weather – Summer (including heavy rains)
- Severe Weather – Winter (including heavy snow loads)

<sup>20</sup> All supporting data for Coastal Erosion, Sea Level Rise (3-foot rise), Flood (all) can be viewed at [https://docs.google.com/spreadsheets/d/1fcN5hL3Jz4X7mldFyKs6wol6J6IAR9bSsvJPiqE\\_A0Q/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1fcN5hL3Jz4X7mldFyKs6wol6J6IAR9bSsvJPiqE_A0Q/edit?usp=sharing)

<sup>21</sup> All supporting data for Earthquake, High Winds, and Severe Weather can be viewed at <https://docs.google.com/spreadsheets/d/1Zx1LZwKQ8esqdv4c9hbbSZurtMjH4UITQWJY1LrZezc/edit?usp=sharing>

<sup>22</sup> All supporting data for Wildfire can be viewed at [https://docs.google.com/spreadsheets/d/1JAbfd3A-eCHI93pZFaPvuM\\_H2yvuUzeHCmoijv-oxsw/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1JAbfd3A-eCHI93pZFaPvuM_H2yvuUzeHCmoijv-oxsw/edit?usp=sharing)

<sup>23</sup> All supporting data for critical facility hazard exposure can be viewed at [https://docs.google.com/spreadsheets/d/1xdwAlryhxXb6KxrmwdqVMhw190BgC6cl6VbbNCB0\\_AM/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1xdwAlryhxXb6KxrmwdqVMhw190BgC6cl6VbbNCB0_AM/edit?usp=sharing)

## Part 3: Hazard Identification and Risk Assessment

### Dam Failure and Levee Failure

Information from the 2016 NJ4 HMP HIRA was also reviewed with relevant Municipal Working Groups to determine the need for updates to hazard exposure results for Dam Failure and Levee Failure.

Working Group members were asked the following questions for Dam and Levee Failure:

- ✓ *Are these facilities still in operation?*
- ✓ *Are there updated Emergency Action Plans or inundation maps for these facilities?*
- ✓ *Have there been any other incidents of failure since the reported records?*

### National Flood Insurance Program Information

One additional metric discussed with all of the Municipal Working Groups except for Shiloh Borough was statistical information from the National Flood Insurance Program (NFIP)<sup>24</sup>. The following are combined numbers for Cumberland County as provided by the New Jersey Office of Emergency Management (NJOEM)<sup>25</sup>:

- Active Policies – 441 active NFIP flood insurance policies
- Claims History – 752 claims made against the NFIP between 1977 and 2021
- Repetitive Loss Properties (RL) – 69 properties designated as RL

For comparison relative to the number of active NFIP flood insurance policies, the following are the number of potentially exposed buildings (per Table 1-5), which are significantly higher than the number of active policies:

- Flood - Within 1 % Annual Chance Zone: 2,432 buildings ~ 4% of total buildings, with a value of \$209,840,477 ~ 2% of the total building value in the County.
- Flood - Near (within 500 feet) of 1% Annual Chance Zone: 11,113 buildings ~ 16% of total buildings, with a value of \$1,411,460,381~ 16% of the total building value in the County.

### **Part 3.5: Demographic Considerations**

Demographic considerations include general population and land use factors. Table 1-7 includes current population estimates and changes since the previous US Census<sup>26</sup>:

**Table 1-7: Cumberland County General Population Demographics**

Metric	Current Estimates
2010 Population	156,898
2019 Population	151,906
Percent Population Change (2010-2019)	- 3.18%
Land Area	483.70 sq. miles
Population Density	314.0 / sq. mile

<sup>24</sup> Information on the NFIP is described in *Section 3: Hazard Identification and Risk Assessment* of the CC HMPU Base Plan.

<sup>25</sup> Spreadsheets provided by NJOEM in October 2021.

<sup>26</sup> US Census, 2019 ACS 5 Year Estimates, Table ID DP5

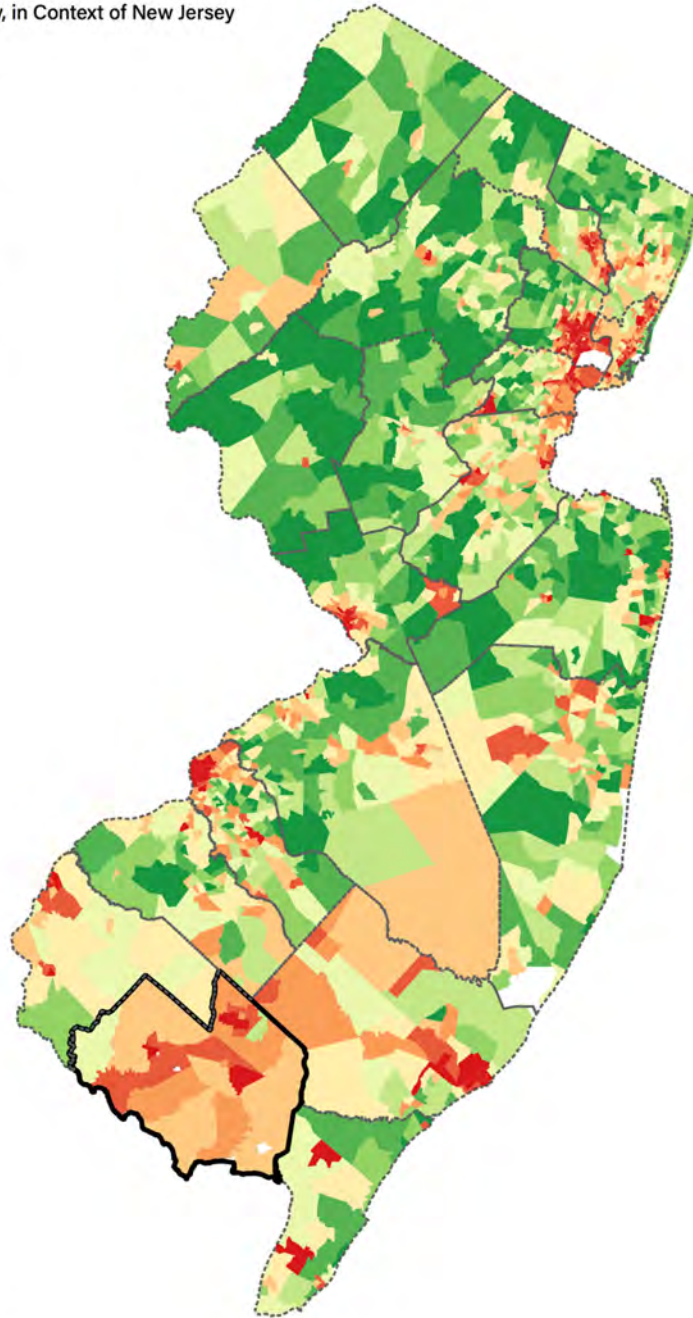
### Part 3: Hazard Identification and Risk Assessment

Demographic considerations also include differences in social vulnerability<sup>27</sup>. Figure 1-6 shows the overall Social Vulnerability (SVI) Index overall scores for Cumberland County in comparison to the rest of New Jersey.

**Figure 1-6: Cumberland County Social Vulnerability Index: Overall Scores**

#### Social Vulnerability Index: Overall Score

Cumberland County, in Context of New Jersey



Source: CDC (2018)

<sup>27</sup> Social vulnerability considerations are described in *Section 3: Hazard Identification and Risk Assessment* of the CC HMPU Base Plan.

## Part 3: Hazard Identification and Risk Assessment

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### Part 3.6: Observations

- Outreach and guidance in cooperation with the Municipal Working Groups, should be provided for residents, business owners, and property owners for:
  - Properties in or near coastal erosion, sea level rise, flood zones or wildfire hazard areas.
  - Older buildings to help evaluate potential risk of damage due to hazards such as Earthquake, High Winds, and Severe Winter Weather (i.e., heavy snow loads).
- Priority for follow-up efforts with the Municipal Working Groups should also be focused on critical facilities housing vulnerable populations related to Extreme Temperature and Severe Weather hazards. For example, determining and documenting (cross referencing EOP) how residents will be moved to facilities providing shelter including cooling and warming centers (all of which would need adequate back-up power and hardening).
- All critical facilities are potentially vulnerable to Earthquake, High Winds, and Severe Weather (heavy rains in summer and snow loads in winter).
- A few critical facilities are potentially vulnerable to Flood and Wildfire and will be identified as priorities for follow-up critical facility field evaluations.



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## Part 3: Hazard Identification and Risk Assessment

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### Part 3.7: Hazard Priorities

As a key step in the Hazard Identification and Risk Assessment (HIRA) process, the eleven (11) natural hazards identified in the CC HMPU Base Plan were discussed during the Municipal Working Group Work Sessions and the relative priority of these hazards was identified.

Based on their personal experience as well as the results of the HIRA, the Municipal Working Groups rated the hazards.<sup>28</sup> The following represents the average hazard ranking from the CC HMPU for Cumberland County municipalities (in order per average priority):<sup>29</sup>

#### High Priority

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

#### Moderate Priority

5. Extreme Temperature
6. Wildfire
7. Coastal Erosion and Sea Level Rise
8. Dam Failure

#### Low Priority

9. Drought
10. Earthquake
11. Levee Failure

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<sup>28</sup> See Part 3.7 of the 14 participating municipalities for their respective individual hazard priorities.

<sup>29</sup> See Section 3 of the Base Plan, Table BP.3-7 and Figure BP.3-1 for tabular and mapped results related to these average hazard rankings.

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## Part 4: Mitigation Measures

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### Part 4: Mitigation Measures

Part 4 includes six subparts:

- *Part 4.1: Mitigation Goals and Strategy*
- *Part 4.2: NJ4 HMP Mitigation Measures*
- *Part 4.3: Municipal Mitigation Measures – Identification*
- *Part 4.4: Municipal Mitigation Measures – Implementation*
- *Part 4.5: Multi-Jurisdictional Mitigation Measures*
- *Part 4.6: Authorities, Policies, Programs, Resources, and Plan Integration*

#### Part 4.1: Mitigation Goals and Strategy

Goals were originally established by the SDVR 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 NJ4 HMP plan update process, these goals were reviewed and edited by the Municipal Working Groups for use in the Municipal Appendices. In addition, the Municipal Working Groups for the CC HMPU reviewed and reaffirmed these goals for continued use in the Appendices.

All mitigation measures in the Municipal Appendices 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 HIRA, and experience of participants in the plan update process, the Municipal Working Group identified an overarching strategy for mitigation:

- Identify and address known problems or areas of concern for critical facilities and vulnerable populations
- Provide opportunities for residents and property owners to access available information about risk reduction and mitigation measures, e.g., useful links added to municipal websites, in particular for Repetitive Flood Loss properties where appropriate
- Institutionalize hazard mitigation into municipal activities and programs through regular interactions of the Municipal Working Group and 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 County Appendix reflect support for this strategy.

## Part 4: Mitigation Measures

### Part 4.2: NJ4 HMP Mitigation Measures

Known problems and areas of concern were the basis for mitigation measures identified in the NJ4 HMP. In cases where these problems and concerns still exist at the time of the CC HMPU, the related NJ4 HMP mitigation measures were candidates for inclusion in the County Appendix.

Table 1-9 identifies the status of mitigation measures included in the NJ4 HMP. These entries were based on information provided by the County Working Group. In some cases, the NJ4 HMP mitigation measures were carried over as part of the County Appendix as indicated in the “Comments” column and the far right-hand column of Table 1-9.

**Table 1-9: Status of Cumberland County NJ4 HMP Mitigation Measures**

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # <small>30</small>
<b>M-1:</b> 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	Work-in-progress	Work-in-progress included: <ul style="list-style-type: none"> <li>▪ General hazard mitigation support for Municipal OEM Coordinators. Cumberland County OEM has held regularly scheduled 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 NJ4 HMP and work-in-progress for the CC HMPU.</li> <li>▪ CC OEM also secured the Pre-Disaster Mitigation Program grant to fund the consultant support for the CC HMPU and supervised all work under the contract.</li> </ul>	Carried over as M-1
<b>M-2:</b> Prioritize county critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.			
<b>M-3:</b> 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.			
<b>M-4:</b> 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.			
<b>M-5:</b> Prioritize recurrent drainage problem areas and initiate data collection with county and, where appropriate, municipal agencies to track unreimbursed damages and related response and recovery expenses.			

<sup>30</sup> Detailed information for identification and implementation of county (M-#) mitigation measures is included in Tables 1-10 and 1-11.

**Part 4: Mitigation Measures**

<b>Mitigation Action, Program, or Project</b>	<b>Status</b>	<b>Comments</b>	<b>Mitigation Measure # 30</b>
<b>M-6:</b> Conduct regular County Working Group meetings consistent with the plan maintenance program and the County Adoption Resolution.			
<b>M-7:</b> 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.			
<b>M-8:</b> Facilitate meetings with state, county, and municipal officials to discuss and resolve implementation issues related to multi-jurisdictional mitigation measures.	Work-in-progress	On-going discussions with state and federal officials.	Carried over as M-2
<b>M-9:</b> Cumberland County Courthouse flooding and mitigation study and action.	Completed	Window well barriers and pipe upgrades (sleeving) seem to have solved the problem (for recent events) using county funds	N/A
<b>M-10:</b> Cumberland County Emergency Operations Center and 911 Center Hardening.	Work-in-progress	Some roofing replacement and strapping added for securing roof with county funding in 2018. Previously applied for EOC grant program to upgrade (and addition) for hurricane wind protection. Considering Homeland Security grant funding to harden building for security purposes.	Carried over as M-3
<b>M-11:</b> Hardening Cumberland County Department of Emergency Services communications towers. Security, monitoring for temperature.	Work-in-progress	Fencing installed and temperature monitoring installed at towers with existing internet capability.	Carried over as M-4
<b>M-12:</b> Cumberland County Backup Emergency Power Generator Program – Round 1	Completed	See below.	N/A

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## Part 4: Mitigation Measures

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### Notes re: M-12:

Cumberland County OEM applied for Hazard Mitigation Grant Program funding for nine (9) back-up emergency power generators and related improvements to key county and municipal facilities including:

1. Buckshuttem School (diesel fuel; 1200 Kw)
2. Cumberland County Fuel Yard and County Area Transit System (diesel fuel; 150 Kw)
3. Cumberland Fire Company (diesel fuel; 100 Kw)
4. Downe Township Municipal Hall (diesel fuel; 150 Kw)
5. Fortescue Fire Department (diesel fuel; 100 Kw)
6. Greenwich School (diesel fuel; 150 Kw)
7. Haleyville School (diesel fuel; 1250 Kw)
8. Maurice River Township Hall (diesel fuel; 150 Kw)
9. Cumberland County College (retrofit electrical wiring to maximize existing generator use)

The total budget for the Cumberland County Generator Program was approximately \$1.4 million. The grant was secured, successfully implemented, and closed.

### **Part 4.3: County Mitigation Measures – Identification**

Table 1-10 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 projects carried over from NJ4 HMP as detailed in Part 4.2
- Include new projects, programs or activities identified by the County Working Group including measures to address known problems or areas of concern for critical facilities and vulnerable populations

Table 1-10 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

**Part 4: Mitigation Measures**

**Table 1-10: Cumberland County Mitigation Measures Identification**

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	<p><u>County Mitigation Program</u> – including sustained efforts in cooperation with municipal Offices of Emergency Management (OEMs) to:</p> <ul style="list-style-type: none"> <li>▪ Conduct outreach and education for residents, businesses, and property owners (see Notes below)</li> <li>▪ Complete critical facility field evaluations to identify potential vulnerabilities and mitigation measures</li> <li>▪ Compile relevant data regarding hazard impacts</li> <li>▪ Support regular interactions of the County Working Group</li> <li>▪ Seek integration of hazard mitigation with other parallel planning initiatives</li> </ul>	All	Goal #s 1, 2, and 3	All
M-2	Facilitate meetings with state, county, and municipal officials to discuss and resolve implementation issues related to multi-jurisdictional mitigation measures. <sup>31</sup>	All	Goals 3 and 4	All
M-3	Complete Cumberland County Emergency Operations Center and 911 Center (CF-9) Hardening including upgrade (and addition) for hurricane wind protection.	High Wind, Severe Winter Weather	Goal #4	Existing
M-4	Complete hardening Cumberland County Department of Emergency Services communications towers (CF-21 through CF-29), including security and monitoring for temperature.	High Wind, Severe Winter Weather	Goal #4	Existing
M-5 <sup>32</sup>	Provide back-up emergency power generator for Cumberland County Fire / Rescue Training Academy (CF-11) for C-POD use.	Power outage due to multiple hazard types.	Goal #4	Existing

**Note re: Mitigation Measure M-1:**

Consistent with Section 2.2 of the CC HMPU Base Plan, CCOEM and the municipal Working Groups have placed a high priority on an expanded effort on stakeholder participation in future plan updates. This enhanced future effort is anticipated to include more concerted and targeted outreach to the public and other stakeholders, and the inclusion of Working Group members who are not elected or appointed municipal officials, or who are not contracted by municipalities to provide professional services.

<sup>31</sup> Part 4.5: Multi-Jurisdictional Mitigation Measures and Table 1-12 includes lists of multi-jurisdictional projects as identified by the Municipal Working Groups.

<sup>32</sup> Mitigation Measure M-5 is a new item identified by the Working Group.

## Part 4: Mitigation Measures

### Part 4.4: County Mitigation Measures – Implementation

Table 1-11 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 criteria<sup>33</sup>
- Project Type to help determine funding options and implementation mechanisms at the municipal level<sup>34</sup>
- 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 municipal level

**Table 1-11: Cumberland County Mitigation Measures Implementation**

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	County Mitigation Program	County OEM and County Working Group	High	Program	Staff Time	On-going, sustained effort	<ul style="list-style-type: none"> <li>▪ Identify outreach and education objectives and methods (working with OEMs)</li> <li>▪ Complete digital version of Critical Facility Field Evaluation for use by OEMs</li> <li>▪ Set priorities (if necessary) and conduct critical facility field evaluations</li> <li>▪ Identify schedule for plan updates (including sustained public participation and plan integration efforts)</li> </ul>
M-2	Facilitate meetings with state, county, and municipal officials to discuss and resolve implementation issues related to multi-jurisdictional mitigation measures.	Cumberland County OEM	Moderate	Varies	Staff time commitment	On-going First Meeting 60 days after Plan adoption.	Confirm Problem Descriptions and Potential Partners per Table 1-12.

<sup>33</sup> Section 4: Mitigation Measures of the CC HMPU Base Plan includes a description of evaluation criteria considered by the County Working Group.

<sup>34</sup> Section 4: Mitigation Measures of the CC HMPU Base Plan includes 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	Complete Cumberland County Emergency Operations Center and 911 Center (CF-9) Hardening.	Cumberland County OEM	Moderate	Hardening Critical Facilities	\$1,500,000 <sup>35</sup>	Project duration estimated at 12 months.	<ul style="list-style-type: none"> <li>▪ Secure EOC grant funding.</li> <li>▪ Prepare RFP if work is to be contracted.</li> <li>▪ Item to remain as need remains but funding sources need to be identified.</li> </ul>
M-4	Complete hardening Cumberland County Department of Emergency Services communications towers (CF-21 through CF-29), including security and monitoring for temperature.	Cumberland County OEM	High	Hardening Critical Facilities	As per engineering best practices	Ongoing	<ul style="list-style-type: none"> <li>▪ Identify remaining work scope.</li> <li>▪ Secure funding.</li> <li>▪ Incremental steps may have to be taken as the opportunity presents itself.</li> </ul>
M-5	Provide back-up emergency power generator for Cumberland County Fire / Rescue Training Academy (CF-11) for C-POD use.	Cumberland County OEM	Low	Back-up Emergency Power Generator	To be determined via project scoping efforts	Three to five years	Conduct project scoping

The following are additional notes regarding the implementation of Mitigation Measure M-1 (consistent with *Part 3.6: Observations*):

- Supporting efforts of the participating municipalities' OEM Coordinators to conduct outreach and guidance should be focused on :
  - Properties with valid Repetitive Loss designations
  - Buildings potentially exposed to Coastal Erosion, Sea Level Rise, Dam Failure, Levee Failure, and/or Wildfire.
  - Buildings in or near the 1% annual flood zone regarding potential risk and availability of NFIP flood insurance.
  - Older buildings to help evaluate potential risk of damage due to hazards such as Earthquake, High Winds, and Severe Weather (heavy rains in summer and heavy snow loads in winter).

Support may take the form of:

- ✓ Working with Cumberland County Planning Department, as well as NJDEP to conduct a workshop for coastal communities re: NJDEP draft regulations
- ✓ Working with NJDEP and FEMA Region II to conduct training regarding NFIP floodplain management requirements
- Considerations for prioritizing and conducting County critical facility field evaluations should include:
  - All CFs are potentially vulnerable to Earthquake, High Winds, and Severe Weather (heavy rains in summer and heavy snow loads in winter).
  - In addition, some CFs are potentially vulnerable to Coastal Erosion, Sea Level Rise, Flood, and/or Wildfire and should also be considered as candidates for follow-up facility-level evaluations.

<sup>35</sup> Estimate based on addition to existing EOC that would be a hardened facility. Cumberland County has submitted EOC Grant Application to the DHS in recent grant cycles.



## Part 4: Mitigation Measures

- Supporting efforts of participating municipalities to conduct critical facility evaluations may include developing and implementing a digital version of the Critical Facility Field Evaluation forms.
- Provisions for Plan Maintenance by the County should include :
  - Conduct regular interactions of the Working Group to keep the plan current (e.g., an annual plan review and amendment process at a minimum)
  - Track and take advantage of plan integration opportunities including noting all upcoming plan updates as part of regular Working Group interactions
- Supporting efforts of participating municipalities to maintain the plan (beyond those efforts identified above) should include advocating and tracking regular interactions and reporting requirements for participating municipalities

### Part 4.5: Multi-Jurisdictional Mitigation Measures

During the Municipal Working Group Work Sessions, the Working Groups identified some NJ4 HMP mitigation measures to be carried over, as well as adding new areas of concern, which were designated as multi-jurisdictional mitigation measures. Implementation of these measures, in the opinion of the Municipal Working Groups, requires participation or leadership from other levels of government, including county, state, and federal agencies. This effort resulted in the identification of sixty-two (62) measures. These multi-jurisdictional mitigation measures have been compiled in Table 1-12.

These measures have been referred to the County Working Group for consideration. As part of the implementation of the CC HMPU, the County Working Group will be working with the municipalities to:

- Confirm identified issues are valid multi-jurisdictional measures
- Identify specific responsibilities amongst different level(s) of government to address these problem areas
- Identify 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
- Identify which, if any, additional mitigation measures the member agencies of the County Working Group will assume responsibility to implement

**Table 1-12: Cumberland County Multi-Jurisdictional Mitigation Measures**

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
Bridgeton City	2-MJ-1	Sunset Lake Dam West Gate Improvements.	Dam Failure	Goal #4	Existing and New	Municipal OEM, Cumberland County	On-going
Commercial Township	3-MJ-1	Sheet piles on County Route 553 bridge (Berry Avenue) to protect against erosion.	Coastal Erosion and Sea Level Rise	Goal #4	Both	Township OEM, Cumberland County Department of Public Works (DPW)	High
Commercial Township	3-MJ-2	Maurice River Shore Protection Improvement Phase I.	Coastal Erosion and Sea Level Rise	Goal #4	Both	Township OEM, Cumberland County DPW	High

**Part 4: Mitigation Measures**

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
Commercial Township	3-MJ-3	Bulkhead for public wharf area to protect shoreline.	Coastal Erosion and Sea Level Rise	Goal #4	New	Township OEM, Cumberland County OEM, and New Jersey Station Police	High
Commercial Township	3-MJ-4	Maurice River Flood Control Structure.	Coastal Erosion and Sea Level Rise	Goal #4	New	Township OEM, Cumberland County DPW	High
Commercial Township	3-MJ-5	Maurice River Mouth Stabilization.	Coastal Erosion and Sea Level Rise	Goal #4	New	Township OEM, Cumberland County DPW, USACE, NJDEP PSE&G, American Littoral Society	High
Commercial Township	3-MJ-6	Alleviate flooding at county bridge at Berry Avenue.	Coastal Erosion and Sea Level Rise	Goal #4	Both	Township OEM, Cumberland County DPW	High
Commercial Township	3-MJ-7	Maintain and upgrade berm located at Peak Of the Moon area.	Flood	Goal #4	Both	Township OEM, Township DPW, Cumberland County DPW, USACE	High
Commercial Township	3-MJ-8	Consultant assessment to define and identify private levee locations within Commercial Township.	Levee Failure	Goal #4	Both	Township OEM, Township DPW, Cumberland County DPW, PSE&G	Low
Commercial Township	3-MJ-9	Clean and maintain ditches on the bay / reduce phragmites throughout Commercial Township to reduce risk of wildfire.	Wildfire	Goal #4	Existing	Township OEM, Township DPW, Cumberland County DPW	Moderate
Commercial Township	3-MJ-10	Increase fire break / berms for residential areas in Port Norris.	Wildfire	Goal #4	Existing	Township OEM, Township DPW, NJ Forest Service	Moderate
Deerfield Township	4-MJ-1	Replace drainage culvert on Shiloh Avenue.	Flood	Goal #4	Existing	Township OEM, Adjacent Landowner, Cumberland County DPW	High
Deerfield Township	4-MJ-2	Address identified repetitive flooding on Morton Avenue.	Flood	Goal #4	Existing	Township OEM, Adjacent Landowners, Cumberland County DPW	Low

## Part 4: Mitigation Measures

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
Downe Township	5-MJ-1	Fortescue Area Improvement Plans.	Coastal Erosion and Sea Level Rise / Flood (Storm Surge & Tidal)	Goal #4	Both	Municipal OEM, Downe Township Initiative Partners	High
Downe Township	5-MJ-2	Dividing Creek / Maple Avenue Improvement Plans.	Coastal Erosion and Sea Level Rise / Flood (Storm Surge & Tidal) / Levee Failure	Goal #4	Both	Municipal OEM, Downe Township Initiative Partners	High
Downe Township	5-MJ-3	Money Island Improvement Plans.	Coastal Erosion and Sea Level Rise / Flood (Storm Surge & Tidal)	Goal #4	Both	Municipal OEM, Downe Township Initiative Partners	High
Downe Township	5-MJ-4	Gandy's Beach Improvement Plans	Coastal Erosion and Sea Level Rise / Flood (Storm Surge & Tidal)	Goal #4	Both	Municipal OEM, Downe Township Initiative Partners	High
Downe Township	5-MJ-5	Nantuxent Creek Improvement Plans	Coastal Erosion and Sea Level Rise / Flood (Storm Surge & Tidal)	Goal #4	Both	Municipal OEM, Downe Township Initiative Partners	High
Downe Township	5-MJ-6	Newport Neck Road	Coastal Erosion and Sea Level Rise / Flood (Storm Surge & Tidal)	Goal #4	Both	Municipal OEM, Cumberland County DPW	High
Fairfield Township	Fairfield Township did not identify any Multi-Jurisdictional Mitigation Measures						
Greenwich Township	7-MJ-1	Potential impacts to evacuation route at Sheppard's Mill Pond.	Dam Failure	Goal #4	Both	Greenwich Township Committee, Cumberland County Road Department	High
Greenwich Township	7-MJ-2	Construct a new levee parallel to and between Mounce Creek and County Route 607 (Bridgeton-Greenwich Road).	Coastal Erosion and Sea Level Rise, Flood, Levee Failure	Goal #4	Both	Greenwich Township Committee, Cumberland County Road Department	High
Greenwich Township	7-MJ-3	Mill Creek Levee	Coastal Erosion and Sea Level Rise, Flood, Levee Failure.	Goal #4	Existing	Greenwich Township Committee, Cumberland County, NJDEP, USACE	High

## Part 4: Mitigation Measures

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
Greenwich Township	7-MJ-4	Market Lane Levee	Coastal Erosion and Sea Level Rise, Flood, Levee Failure.	Goal #4	Existing	Greenwich Township Committee, Cumberland County, NJDEP, USACE	High
Greenwich Township	7-MJ-5	Construct the new Pine Mount Creek Levee and flood gates.	Coastal Erosion and Sea Level Rise, Flood, Levee Failure.	Goal #4	Existing	Greenwich Township Committee, Cumberland County, NJDEP, USACE	High
Greenwich Township	7-MJ-6	Alleviate flooding at Pine Mount Run at Gum Tree Corner Road (County Route 639) and Bacon Neck Road (County Route 642).	Coastal Erosion and Sea Level Rise, Flood	Goal #4	Existing	Greenwich Township Committee, Cumberland County Road Department	High
Greenwich Township	7-MJ-7	Conduct tree survey and develop tree trimming and removal program	High Wind	Goal #4	Existing	Greenwich Township Committee, Cumberland County DPW	Moderate
Hopewell Township	8-MJ-1	Alleviate flooding at Columbia Highway between County Route 661 (Barrett's Run Road) and County Route 635 (Old Cohansey Road).	Flood	Goal #4	Both	Township OEM, Cumberland County DPW	Moderate
Lawrence Township	9-MJ-1	Alleviate flooding at County Route 653 (Bowers Creek Road), east side of White Bridge.	Flood	Goal #4	Both	Township OEM, Cumberland County DPW	Low
Lawrence Township	9-MJ-2	Risk assessment of Cedarville Lake Dam and related drainage systems.	Dam Failure	Goal #4	Both	Township OEM, Cumberland County DPW	Moderate
Maurice River Township	10-MJ-1	Alleviate flooding at Main Street, Dorchester at Crowder Run (CR 616).	Flood	Goal #4	Both	Township OEM, Cumberland County Departments of Public Works and Engineering, NJDOT, NJDEP	High

## Part 4: Mitigation Measures

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
Maurice River Township	10-MJ-2	Alleviate flooding at Glade Road, between Heislerville and Delmont (CR 616).	Flood	Goal #4	Both	Township OEM, Cumberland County Departments of Public Works and Engineering, NJDOT, NJDEP	High
Maurice River Township	10-MJ-3	Alleviate flooding at NJ 47 (State Evacuation Route) in Bricksboro.	Flood	Goal #4	Both	Township OEM, Cumberland County Departments of Public Works and Engineering, NJDOT, NJDEP	High
Maurice River Township	10-MJ-4	Alleviate flooding at Mauricetown Causeway (CR 670).	Flood	Goal #4	Both	Township OEM, Cumberland County Departments of Public Works and Engineering, NJDOT, NJDEP	High
Maurice River Township	10-MJ-5	Alleviate flooding at East Point Road.	Flood	Goal #4	Both	Township OEM, Cumberland County Departments of Public Works and Engineering, NJDOT, NJDEP	High
Maurice River Township	10-MJ-6	Alleviate flooding at River Road.	Flood	Goal #4	Both	Township OEM, Cumberland County Departments of Public Works and Engineering, NJDOT, NJDEP	High
Maurice River Township	10-MJ-7	Alleviate flooding at Newell Road (CR 616).	Flood	Goal #4	Both	Township OEM, Cumberland County Departments of Public Works and Engineering, NJDOT, NJDEP	High
Maurice River Township	10-MJ-8	Alleviate flooding at NJ 47 (State Evacuation Route) & Whitney Point.	Flood	Goal #4	Both	Township OEM, Cumberland County Departments of Public Works and Engineering, NJDOT, NJDEP	High
Maurice River Township	10-MJ-9	Alleviate flooding at Carlisle Place Road at Crowder Run Branch Crossing in Dorchester (CR 709).	Flood	Goal #4	Both	Township OEM, Cumberland County Departments of Public Works and Engineering, NJDOT, NJDEP	High

## Part 4: Mitigation Measures

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
Maurice River Township	10-MJ-10	Mouth of the Maurice River Habitat Restoration Project.	Sea Level Rise / Levee Failure	Goal #4	Existing	Township OEM, Commercial Township OEM, Cumberland County DPW, USACE, NJDEP (Fish & Wildlife), FEMA Public Assistance, PSE&G, American Littoral Society	High
Maurice River Township	10-MJ-11	Impact of Sea Level Rise on septic systems and cess pools.	Sea Level Rise	Goal #4	Existing	Township OEM, Cumberland County Department of Health, NJ DEP	Low
Maurice River Township	10-MJ-12	East Point Lighthouse Protection.	Coastal Erosion and Sea Level Rise	Goal #4	Existing	Township OEM et al to be determined	High
Maurice River Township	10-MJ-13	East Point Road and Bay Avenue Protection.	Coastal Erosion and Sea Level Rise	Goal #4	Existing	Township OEM et al to be determined	High
Maurice River Township	10-MJ-14	Absorption Booms Anchoring / Mooring Points	Hazardous Material (Oil Spill) Releases	Goal #4	Existing	Township OEM et al to be determined	High
Maurice River Township	10-MJ-15	East Point Road Levee/Berm and Wooden Bridge Improvements	Levee Failure	Goal #4	Existing	Township OEM, Cumberland County, et al	Moderate
Maurice River Township	10-MJ-16	Railroad Embankment Improvements	Levee Failure	Goal #4	Existing	Township OEM, Cumberland County, et al	Moderate
Maurice River Township	10-MJ-17	Bricksboro "McGinty" Dike Improvements	Levee Failure	Goal #4	Existing	Township OEM, Cumberland County, et al	Moderate
Maurice River Township	10-MJ-18	Manumuskin Creek Bulkhead Improvements	Levee Failure	Goal #4	Existing	Township OEM, Cumberland County, NJ DEP, et al	High
Maurice River Township	10-MJ-19	Drainage Ditch Maintenance Program	Levee Failure	Goal #4	Existing	Township OEM, Cumberland County, et al	High
Millville City	11-MJ-1	Address repetitive flooding in White Marsh Run Corridor.	Coastal Erosion and Sea Level Rise / Flood	Goal #4	Both	Municipal OEM, City Commission, Floodplain Administrator, Cumberland County Road Department, NJ Department of Environmental Protection (NJDEP)	High

## Part 4: Mitigation Measures

Municipality	#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
Millville City	11-MJ-2	Address repetitive flooding in Petticoat Stream Corridor including South 2nd Street / Maylin Street and roadways in Village Apartments vicinity.	Coastal Erosion and Sea Level Rise / Flood	Goal #4	Both	Municipal OEM, City Commission, Floodplain Administrator, Cumberland County Road Department, NJDEP	Moderate
Millville City	11-MJ-3	Establish interconnection with Vineland City water system.		Goal #4	Both	City of Millville Water / Sewer Department, City of Vineland Municipal Utilities.	Low
Millville City	11-MJ-4	Create safety zones around critical facilities in wildfire risk areas.	Wildfire	Goal #4	Existing	Municipal Fire Department, NJ State Forest Service	Low
Shiloh Borough	Shiloh Borough did not identify any Multi-Jurisdictional Mitigation Measures						
Stow Creek Township	13-MJ-1	Alleviate drainage problems along Roadstown Road near the Stow Creek-Hopewell Firehouse (County Roads 620 and 626) (CF-3).	Flood	Goal #4	Both	Township OEM, Cumberland County Road Department.	Moderate
Stow Creek Township	13-MJ-2	Alleviate drainage problems on State Highway 49 north of Shiloh Borough.	Flood	Goal #4	Both	Township OEM, Hopewell Township OEM, Cumberland County Road Department, NJ DOT.	Moderate
Stow Creek Township	13-MJ-3	Provide hardening against wind for Hopewell – Stow Creek Fire House (CF-1 and CF-2).	High Wind	Goal #4	Existing	Township OEM, Hopewell Township OEM	High
Stow Creek Township	13-MJ-4	Alleviate flooding on Causeway Road.	Flood	Goal #4	Existing	Township OEM, Cumberland County Road Department.	Moderate
Upper Deerfield	14-MJ-1	Install backup power for Cumberland Regional High School.	Power outage due to multiple hazard types.	Goal #4	Both	Township OEM, six other jurisdictions served by CRHS, Cumberland County DPW	High

**Part 4: Mitigation Measures**

<b>Municipality</b>	<b>#</b>	<b>Problem Description</b>	<b>Hazard(s) Addressed</b>	<b>Goal Addressed</b>	<b>Applies to Existing or New Structures</b>	<b>Potential Partners</b>	<b>Priority</b>
Upper Deerfield	14-MJ-2	Alleviate flooding on Freesburg Road (NJ Route 77).	Flood	Goal #4	Both	Township OEM, Cumberland County DPW, NJ State DOT	High
Upper Deerfield	14-MJ-3	Alleviate flooding on County Route 617 (Finley Road) and New Jersey Highway 77.	Flood	Goal #4	Existing	Township OEM, Cumberland County DPW, NJ State DOT	High
Upper Deerfield	14-MJ-4	Alleviate flooding on Highway 77 between Finley Road and Hoover Road.	Flood	Goal #4	Existing	Township OEM, Cumberland County DPW, NJ State DOT	Low
Vineland City	15-MJ-1	Alleviate flooding problems on Sherman Avenue (west of Route 55).	Flood	Goal #4	Both	Municipal OEM, Cumberland County Public Works and Engineering	Moderate
Vineland City	15-MJ-2	Alleviate flooding problems at Cedar Crest Village Trailer Park (see notes below).	Flood	Goal #4	Both	Municipal OEM, Cumberland County Engineering, Cedar Crest Village Trailer Park	High



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## Part 4: Mitigation Measures

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### 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 CC HMPU Base Plan regarding existing authorities, policies, and programs in the County
- Resources - Cross referencing relevant information and recommendations in the CC HMPU Base Plan regarding improving capabilities and coordination at the County and municipal level and specific information about Cumberland County's available resources
- Plan Review and Integration – Identifying plans and programs included in the development of Plan Integration recommendations in the CC HMPU Base Plan

#### 4.6.1: Authorities, Policies, and Programs

*Section 4.6: Authorities, Policies, Programs, Resources, and Plan Integration* of the CC HMPU Base Plan summarizes relevant authorities, policies, and programs related to hazard mitigation in Cumberland County.

Cumberland County does not directly participate in the NFIP. However, as part of the implementation of the CC HMPU, efforts of the Cumberland County Working Group includes:

- Encouraging involvement of participating municipalities' Floodplain Managers / Administrators during the CC HMPU implementation process
- Supporting the commitment to adopt updated FIRMs (if appropriate) and evaluate / update the municipality's Flood Damage Prevention Ordinance as appropriate per recommendations included in Section 4.6 of the CC HMPU Base Plan and under Part 4.6.3: Plan Review and Integration of this Appendix.

#### 4.6.2: Resources

The update of the NJ4 HMP included reexamining participating jurisdictions' hazard mitigation and floodplain management capabilities; potential for improving capabilities and coordination within and between jurisdictions; and plan integration considerations, including:

- *Section 4: Mitigation Measures* of the CC HMPU Base Plan includes summary observations and recommendations concerning:
  - Capabilities for hazard mitigation planning and mitigation measure implementation and floodplain management for the participating jurisdictions
  - Coordination within municipal governments, between municipal governments and their communities, and between municipal, county, and state agencies responsible for hazard mitigation
- *Section 4.6: Authorities, Policies, Programs, Resources, and Plan Integration* of the CC HMPU Base Plan also includes summary statements regarding county and municipal resources and the impact of resource limitations on the overall approach to the CC HMPU mitigation strategies.

Table 1-13 compares the results of the Capability Assessment Survey for the County as a whole and Cumberland County.

## Part 4: Mitigation Measures

**Table 1-13: Cumberland County Capability Assessment Survey Results**

Metric	Cumberland County Results (n=8)	Cumberland County "as a whole" Results (n=85)
Position Type: <b>Full-time</b>	100.00%	51.76%
Position Type: <b>Part-time</b>	0.00%	36.47%
Position Type: <b>Volunteer</b>	0.00%	11.76%
Time in Position: <b>Less than 1 year</b>	25.00%	12.94%
Time in Position: <b>1 to 2 years</b>	50.00%	8.24%
Time in Position: <b>2 to 5 years</b>	12.50%	23.53%
Time in Position: <b>More than 5 years</b>	12.50%	55.29%
Prior Experience: <b>None</b>	75.00%	57.65%
Prior Experience: <b>with hazard mitigation planning</b>	12.50%	31.76%
Prior Experience: <b>with HMA grant administration</b>	25.00%	12.94%
Prior Experience: <b>with floodplain management</b>	0.00%	7.06%
Training / Certifications: <b>None</b>	50.00%	75.29%
Training / Certifications: <b>for hazard mitigation planning and implementation</b>	37.50%	9.41%
Training / Certifications: <b>for floodplain management</b>	0.00%	15.29%

In general terms, when compared to the sampled individuals from across all the Working Groups, Cumberland County has:

- Higher percentage of full-time staff
- Lower average time in current positions
- Lower percentage of staff with experience in hazard mitigation planning and floodplain management
- Higher percentage of staff with experience in HMA grant administration
- Higher percentage of staff with training for hazard mitigation planning and implementation
- Lower percentage of staff with training for floodplain management

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## Part 4: Mitigation Measures

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### 4.6.3: Plan Review and Integration

Section 4.6: *Authorities, Policies, Programs, Resources, and Plan Integration* of the CC HMPU Base Plan includes:

- Table BP.4-2 that identifies primary plans and documents collected from each of the participating municipalities.
- Includes results of reviewing primary plans and documents to determine the extent to which these documents reflect up-to-date hazard risk and mitigation.
- Includes recommendations for integrating the results of the CC HMPU, 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

The plan maintenance process articulates and specifies 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 the municipality.

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

- Cumberland County Emergency Operations Plan
- Cumberland County master plans and related documents

*Note: Cumberland County is not a participating community in the NFIP and therefore does not have a Flood Damage Prevention Ordinance::*

## Part 4: Mitigation Measures

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