



Cumberland County Multi-Hazard Mitigation Plan Update
Participating Jurisdiction Appendices

Appendix 14
Upper Deerfield Township, New Jersey

August 22, 2022

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Part 1: Overview

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: Upper Deerfield Township Municipal Appendix

This Municipal Appendix is focused on Upper Deerfield Township in Cumberland County, New Jersey.

The Upper Deerfield Township Municipal Working Group developed the Upper Deerfield Township Municipal Appendix for adoption by the Upper Deerfield Township Committee and subsequent approval by Region II of the Federal Emergency Management Agency.

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 14-1 identifies the Municipal Working Group members. As detailed in *Section 2: Planning Process* of the Base 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.

Municipal 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: Four 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 14-1: Upper Deerfield Township Working Group

First Name	Last Name	Department	Position	Project Kick-off Meeting ¹	Round 1 Work Session ²	Round 2 Work Session ³	Contribution ⁴
Chad	Ott *	OEM / EMS	OEM Coordinator / Fire Department Liaison / EMS Chief / Public Works Director	☑	☑	☑	Organized Working Group and Work Sessions.
James (Jim)	Crilley *	Administration	Mayor				
John	Daddario	Township Committee	Deputy Mayor				
Roy	Spoltore *	Administration	Administrator / Floodplain Administrator		☑	☑	

¹ Project Kickoff Meeting was held on May 20, 2021.

² Round 1 Work Session was held on August 10, 2021.

³ Round 2 Work Session was held on November 16, 2021.

⁴ Additional or unusual contributions are noted in the far-right hand column.

Part 2: Participation

First Name	Last Name	Department	Position	Project Kick-off Meeting ¹	Round 1 Work Session ²	Round 2 Work Session ³	Contribution ⁴
Brian	Murphy *	Engineering	Engineer			<input checked="" type="checkbox"/>	
Teresa	Warburton	Construction / School Board	Construction Official / Member				

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

- Community / Faith-Based Organizations
- Major Employers and Businesses (via Local Emergency Planning Committee regularly scheduled meetings)

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
- Police
- Transportation Department
- Environmental Organizations
- Non-Governmental Organizations
- Critical Infrastructure and Key Resources
- Healthcare Institutions

Part 2: Participation

Part 2.2: Public Participation

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

Table 14-2 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 14-2: Public Participation

Date	Type of Involvement	Location
June 10, 2021	Link to Project Website ⁵ established and maintained.	Township OEM website ⁶
June 24, 2021	Project start-up notification provided to Township Committee at regular scheduled meeting.	Township Building
June 28, 2021	Flyer distributed to Local Emergency Planning Committee and posted at Township Building.	Township Building
September 8, 2021	Preliminary Draft Municipal Appendix available for public comment.	Project Website ⁵
September 15, 2021	Notice posted re: Preliminary Draft Municipal Appendix review period with link to Project Website.	Township OEM website ⁶
October 7, 2021	Notice provided to Township Committee regarding availability of Preliminary Municipal Appendix for review.	Township Building
April 6, 2022	Notice posted re: Public Review Draft Municipal Appendix review period with link to Project Website.	Township OEM website ⁶
April 19, 2022	Public Review Draft Municipal Appendix available for public comment.	Project Website ⁵

Public comments and input received for the Preliminary Draft and Public Review Draft versions of the Municipal Appendix were considered by the Municipal Working Group and incorporated into the Municipal Appendix where appropriate. In addition, the Municipal 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 Municipal Appendix.⁷ In addition, public participation will continue to be encouraged during subsequent plan implementation and maintenance activities.⁸

⁵ <https://www.upperdeerfield.com/emergencymanagement.htm>

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

⁷ Public education and outreach is described in *Section 4: Mitigation Measures* of the CC HMPU Base Plan.

Part 3: Hazard Identification and Risk Assessment

Part 3: Hazard Identification and Risk Assessment

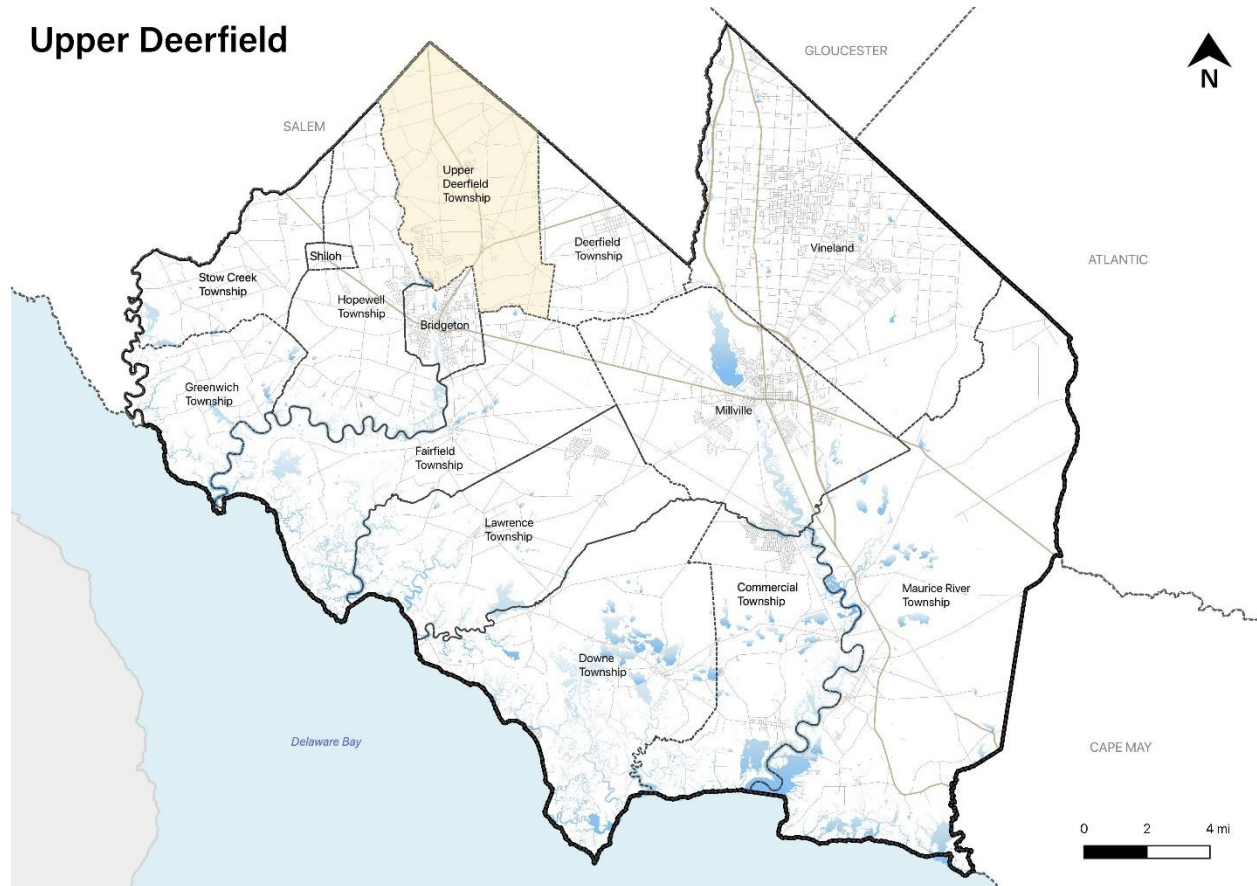
Part 3 includes seven subparts:

- *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

Upper Deerfield Township is located in the northern corner of Cumberland County (See Figure 14-1).

Figure 14-1: Upper Deerfield Township Location Map

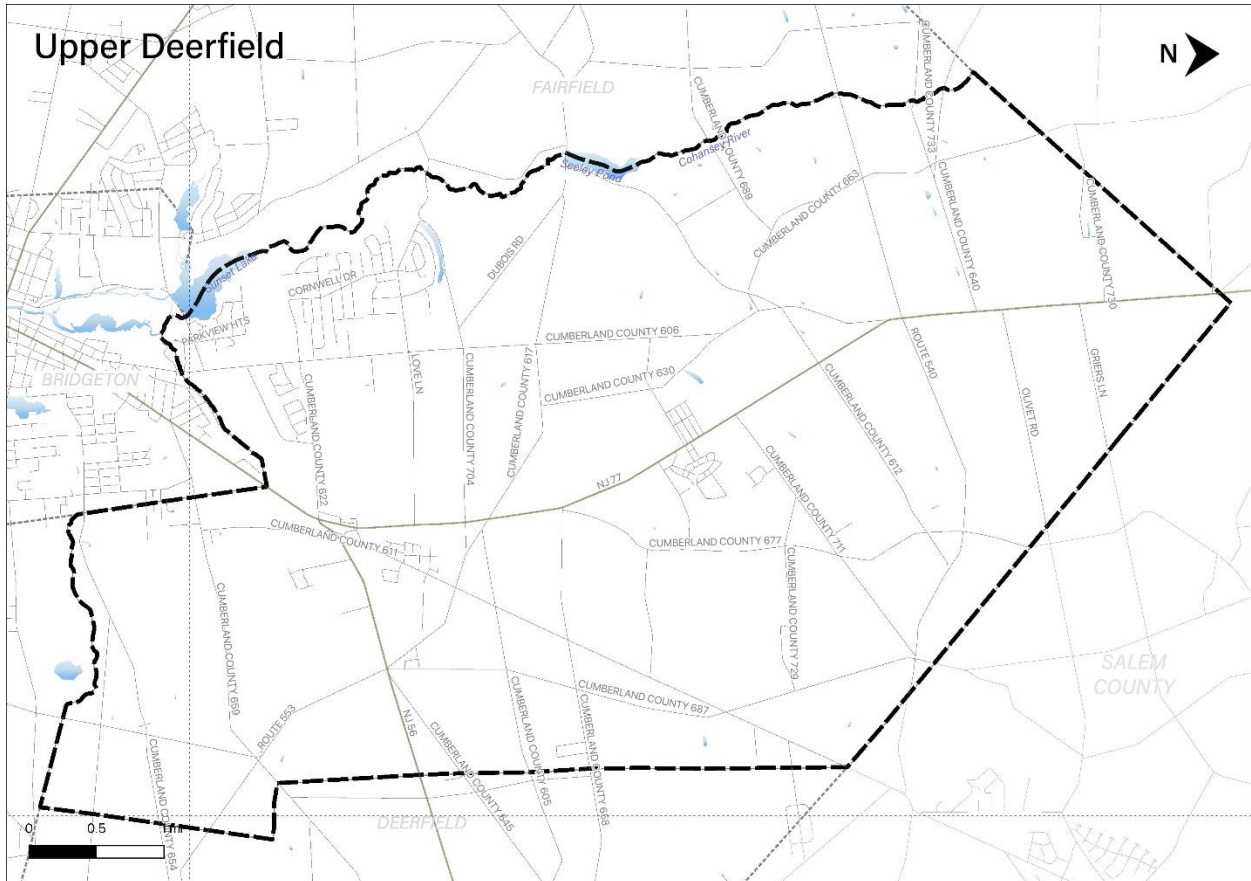


Part 3: Hazard Identification and Risk Assessment

Upper Deerfield Township is a farming community with a growing commercial and residential area. Seabrook Farms is the one unincorporated community in the municipality.

Per Figure 14-2, major water courses include the Cohansy River, which forms the western boundary of the municipality, and Foster Run. Major transportation routes include State Highway Routes 77 and 56, and County Routes 540 (Almond Road), 553 (Centerton Road) and 606 (Old Deerfield Pike). The land is predominantly flat to gently rolling and existing land cover is mostly farmland.

Figure 14-2: Upper Deerfield Township Base Map



Part 3: Hazard Identification and Risk Assessment

Part 3.2: General Building Stock

As of 2015, there are 4,553 buildings in Upper Deerfield Township with a total assessed value of improvements of \$593,103,021. Figure 14-3 shows the footprints of these buildings.

Figure 14-3: Upper Deerfield Township Building Footprints⁹

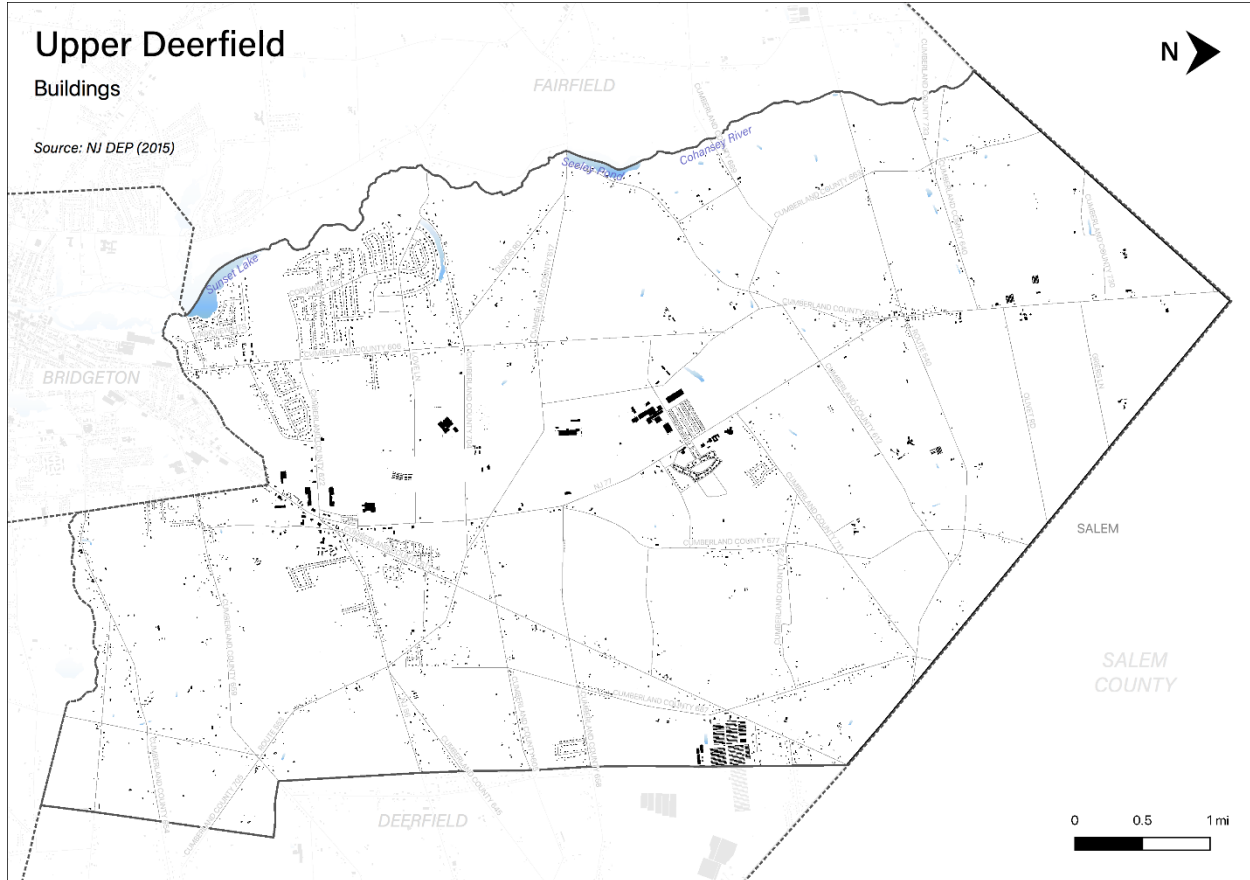


Table 14-3 shows the distribution of these structures according to land use distinctions.

Table 14-3: Upper Deerfield Township Buildings per Land Use Type¹⁰

Land Use Type	Residential	Commercial	Industrial	Other
Number of Buildings	3,162	201	7	928
% of Total	74%	5%	0%	21%

⁹ 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.

¹⁰ 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 Facilities¹¹

As of April 2022, there are twenty-five (25) critical facilities in Upper Deerfield Township.

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 14-4 includes current inventory information for municipal critical facilities and cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix. Figure 14.4 shows the location of these critical facilities.

Table 14-4: Upper Deerfield Township 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	1325 Highway 77, Seabrook		N	Y ¹²		M-2 & M-9
CF-2	Emergency Operations Center	EOC	Co-located Facilities	69 Cornwell Drive, Bridgeton	CF-5	N	Y		
CF-3	Station #1	FireStation	Stations	1538 State Highway 77, Bridgeton		N	Y		
CF-4	Station #32	FireStation	Stations	90 Foster Road, Seabrook		Y	Y	Holding area, e.g., no shower facilities, until access to County facilities is available.	
CF-5	Station #33	FireStation	Stations	69 Cornwell Drive, Bridgeton		N	Y		
CF-6	EMS	EMS	Municipal Stations	10 Hoover Road, Seabrook		N	Y		

¹¹ Critical facility definitions and considerations are described in *Section 3: Hazard Identification and Risk Assessment* of the CC HMPU Base Plan.

¹² 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-7	Public Works	Public Works	Co-located Administrative Office, Maintenance / Work Area, Equipment / Material Storage, and Fueling Station	80 Old Burlington Road, Seabrook		N	N		M-3
CF-8	Love Lane Plant	Utilities – Water	Treatment Plants	56 Love Lane, Bridgeton		N/A	Y		
CF-9	Seabrook Plant	Utilities – Water	Treatment Plants	1368 Highway 77, Bridgeton		N/A	Y		
CF-10	Carlls Corner Pump Station	Utilities – Wastewater	Pump Stations / Lift Stations	Carlls Corner, Upper Deerfield		N/A	Y		
CF-11	Sunset Lake	Utilities – Wastewater	Pump Stations / Lift Stations	Sunset Lake, Upper Deerfield		N/A	Y		
CF-12	Padgetts Lift Station	Utilities – Wastewater	Pump Stations / Lift Stations	Padgetts, Upper Deerfield		N/A	N		
CF-13	Upper Deerfield Estates Lift Station	Utilities – Wastewater	Pump Stations / Lift Stations	Upper Deerfield Estates, Upper Deerfield		N/A	N		
CF-14	Johns Way Lift Station	Utilities – Wastewater	Pump Stations / Lift Stations	Johns Way, Upper Deerfield		N/A	N		
CF-15	West Sunset Drive Lift Station	Utilities – Wastewater	Pump Stations / Lift Stations	West Sunset Drive, Seabrook		N/A	N		
CF-16	C.F. Seabrook Elementary School	Schools	Public Schools	1373 Highway 77, Seabrook		N	Y ¹³		M-4
CF-17	Cumberland Regional High School	Schools	Public Schools	90 Silver Lake Road, Bridgeton		Y	Y	Shelter is ARC-certified. Generator adequate to run shelter functions	
CF-18	Elizabeth F. Moore Elementary School	Schools	Public Schools	1369 Highway 77, Seabrook		N	N		M-5
CF-19	Woodruff Elementary School	Schools	Public Schools	1385 Highway 77, Seabrook		N	Y ¹³		M-6

¹³ Back-up generator provides partial building coverage for IT.

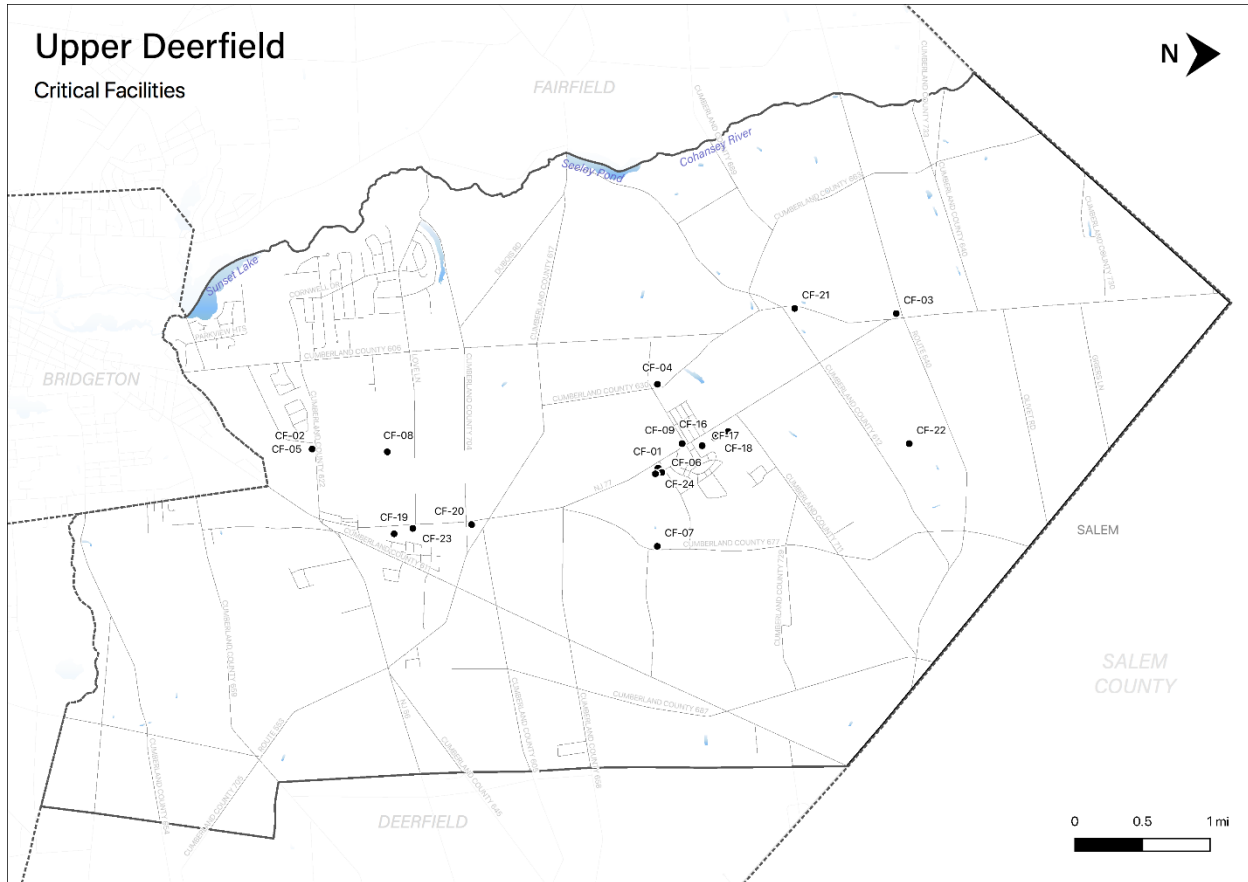
Part 3: Hazard Identification and Risk Assessment

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-20	Upper Deerfield Pre-School and Kindergarten	Schools	Private Schools	1123 Highway 77, Bridgeton		N	N		
CF-21	Remsterville Learning Center in Bridgeton	Schools	Private Schools	1185 Highway 77, Bridgeton		N	N		
CF-22	Upper Deerfield Presbyterian Church	Schools	Private Schools	530 Old Deerfield Pike, Bridgeton		N	N		
CF-23	Seabrook House Group Home/ Administration Drug Rehabilitation	Vulnerable Populations Facilities	Private Group Home	133 Polk Lane, Bridgeton		N ¹⁴	Y	Two buildings at this facility location.	
CF-24	Senior Care Centers of America	Vulnerable Populations Facilities	Private Adult Day Care	1137 Highway 77, Bridgeton		N ¹⁴	N		
CF-25	Senior Center	Vulnerable Populations Facilities	Senior Centers	1323 Highway 77, Seabrook		N	N		M-7

¹⁴ Shelter in place.

Part 3: Hazard Identification and Risk Assessment

Figure 14-4: Upper Deerfield Township 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 Plan¹⁵.

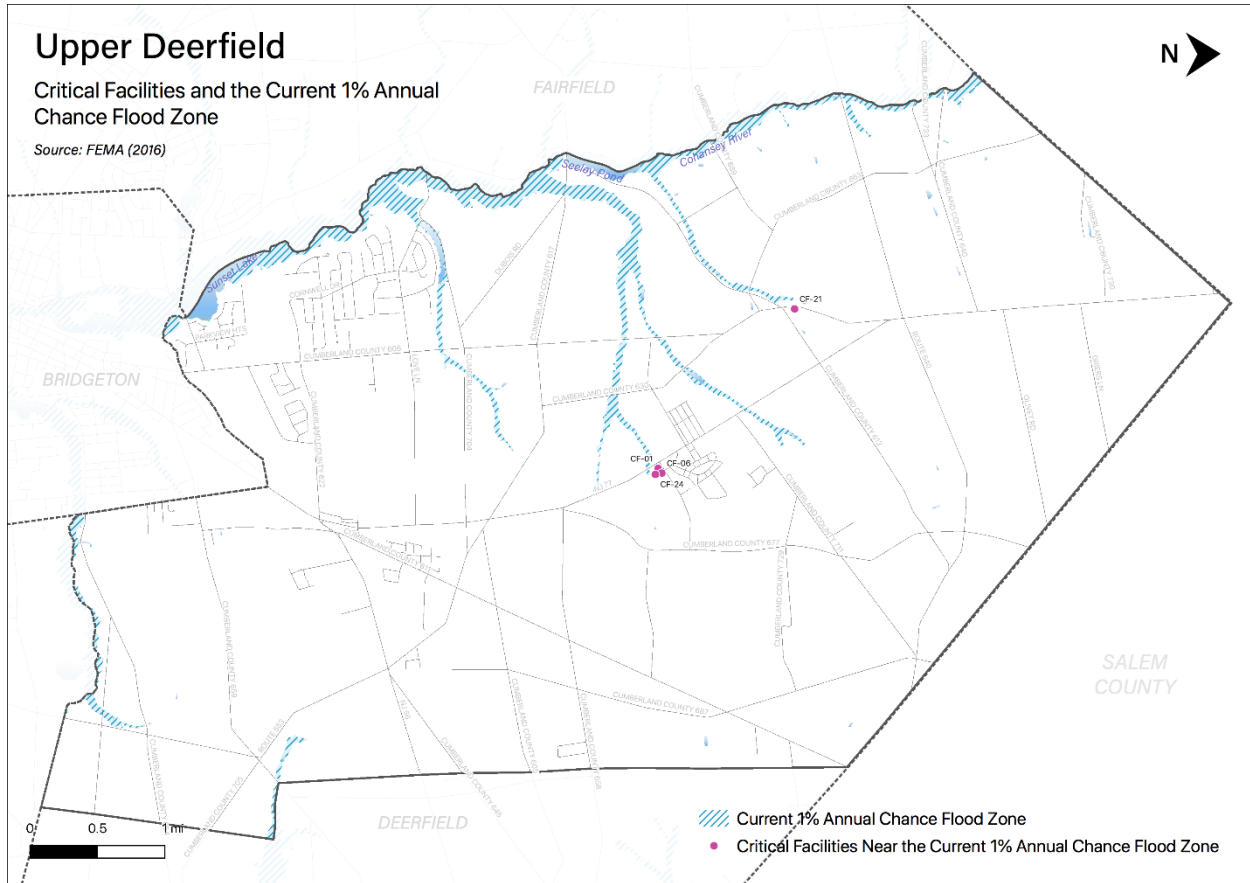
Key results for Upper Deerfield Township are depicted in the following.

Mapping: Figure 14-5 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).

¹⁵ Hazard profiles are included for all eleven natural hazards in *Section 3: Hazard Identification and Risk Assessment* of the CC HMPU Base Plan.

Part 3: Hazard Identification and Risk Assessment

Figure 14-5: Upper Deerfield Township Critical Facilities and 1% Annual Chance Flood Zone



Mapping results are available for general building stock and critical facilities for the following hazards:¹⁶

- Earthquake
- Extreme High Temperature
- Flood - per FEMA FIRM 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 14-5 indicates hazard exposure for general building stock
- Table 14-6 indicates hazard exposure for critical facilities

¹⁶ 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/s8jb3aiu4rxqf2v/AADAwlbOcPPTK3NJl73EJiS-a?dl=0>.

Part 3: Hazard Identification and Risk Assessment

Table 14-5: Upper Deerfield Township 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 ¹⁷	0	N/A	0	N/A
Sea Level Rise - 3 feet increase	0	N/A	0	N/A
Flood - Within 1 % Annual Chance Zone	12	-	\$683,500	-
Flood - Near (within 500 feet) of 1% Annual Chance Zone	493	11%	\$77,673,233	13%
Earthquake – Structure built before 1927 ¹⁸	300	9%	\$35,478,733	8%
High Winds / Severe Weather – Structure built before 1975	2,214	67%	\$255,920,633	57%
Wildfire – Composite score > 2.5 ¹⁹	47	1.03%	\$9,665,600	1.63%

Table 14-6: Upper Deerfield Township Critical Facilities Hazard Exposure²⁰

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-01, CF-06, CF-21, CF-24
Flood – Future potential (within 1,000 feet) 1% Annual Chance Zone	None	N/A
Wildfire	4	CF-04, CF-19, CF-22, CF-24

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)

¹⁷ All supporting data for Coastal Erosion, Sea Level Rise (3-foot rise), Flood (all) can be viewed at https://docs.google.com/spreadsheets/d/1fcN5hL3Jz4X7mldFyKs6wol6J6IAR9bSsvJPIgE_A0Q/edit?usp=sharing

¹⁸ All supporting data for Earthquake, High Winds, and Severe Weather can be viewed at <https://docs.google.com/spreadsheets/d/1Zx1LZwKQ8esgdv4c9hbbSZurtMjH4UITQWJY1LrZezc/edit?usp=sharing>

¹⁹ All supporting data for Wildfire can be viewed at https://docs.google.com/spreadsheets/d/1JAbfd3A-eCHI93pZFaPVuM_H2yvuUzeHCmoijv-oxsw/edit?usp=sharing

²⁰ All supporting data for critical facility hazard exposure can be viewed at <https://docs.google.com/spreadsheets/d/1MPLiOANm7fHoyKuxyWqyanq26LTSPayTxJvLmK5IGPg/edit?usp=sharing>

Part 3: Hazard Identification and Risk Assessment

Information from the 2016 NJ4 HMP HIRA was also reviewed with the Working Group to determine the need for updates to hazard exposure results for Dam Failure.

Dam Failure

Per the New Jersey Department of Environmental Protection (NJDEP) data²¹:

- There are two (2) “Significant Hazard” dams located in the Township:
 - Bostwicks Pond Dam on the Cohansey River
 - Silver Lake Dam on Loper Run
- In addition, two (2) dam failure incidents have been recorded in the Township:
 - Bostwicks Pond Dam in 1999
 - Seeley’s Mill Pond Dam in 2011
- No (0) other dam failure incidents had been recorded in the Township as of 2014

Working Group members were asked the following questions for Dam 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?*

Per the Upper Deerfield Township Working Group, there were no changes to the NJ4 HMP HIRA Dam Failure hazard exposure results.

National Flood Insurance Program Information

One additional metric discussed with the Working Group was statistical information from the National Flood Insurance Program (NFIP)²². The following are relevant numbers for Upper Deerfield Township as provided by the New Jersey Office of Emergency Management (NJOEM)²³:

- Active Policies – six (6) active NFIP flood insurance policies
- Claims History – three (3) claims made against the NFIP between 2003 and 2011
- Repetitive Loss Properties (RL) – no (0) 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 14-5), which are significantly higher than the number of active policies:

- Flood - Within 1 % Annual Chance Zone: 12 buildings ~ <1% of total buildings, with a value of \$683,500 ~ <1% of the total building value in the Township.
- Flood - Near (within 500 feet) of 1% Annual Chance Zone: 493 buildings ~ 11% of total buildings, with a value of \$77,673,233 ~ 13% of the total building value in the Township.

²¹ (1) NJDEP Dam Safety and Flood Control (Dam Locations); (2) NJDEP Land Use / Land Cover; (3) US Census Bureau 2010 Census

²² Information on the NFIP is described in *Section 3: Hazard Identification and Risk Assessment* of the CC HMPU Base Plan.

²³ Spreadsheets provided by NJOEM in October 2021.

Part 3: Hazard Identification and Risk Assessment

Part 3.5: Demographic Considerations

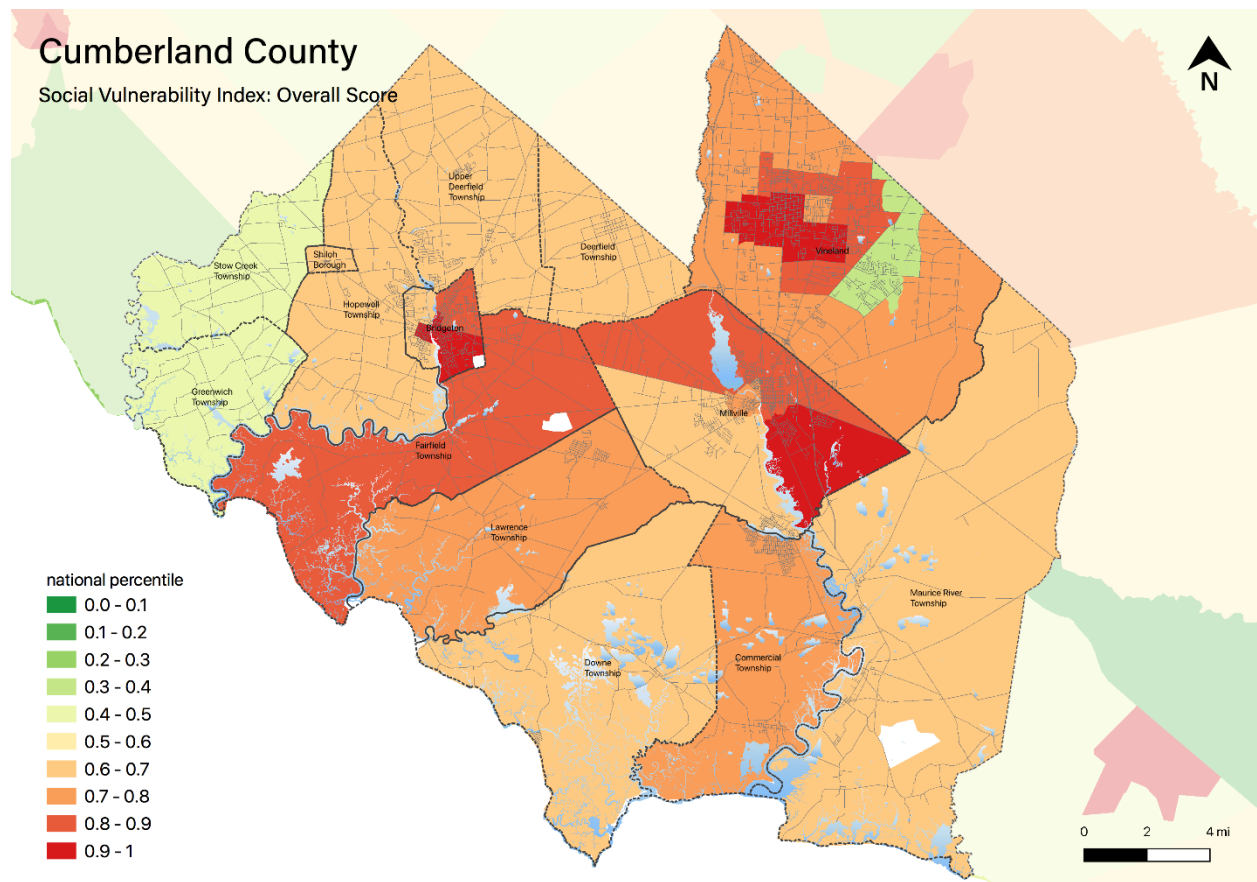
Demographic considerations include general population and land use factors. Table 14-7 includes current population estimates and changes since the previous US Census²⁴:

Table 14-7: Upper Deerfield Township General Population Demographics

Metric	Current Estimates
2010 Population	7,660
2019 Population	7,379
Percent Population Change (2010-2019)	- 3.67%
Land Area	31.10 sq. miles
Population Density	237.3 / sq. mile

Demographic considerations also include differences in social vulnerability²⁵. Figure 14-6 shows the overall Social Vulnerability (SVI) Index overall scores for Cumberland County.

Figure 14-6: Cumberland County Social Vulnerability Index: Overall Scores



²⁴ US Census, 2019 ACS 5 Year Estimates, Table ID DP5

²⁵ 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

For Upper Deerfield Township, Table 14-8 includes selected metrics where social vulnerability considerations are noteworthy when compared with all national census tracts:

Table 14-8: Upper Deerfield Township Social Vulnerability Considerations²⁶

Metric	Comparison with all National Census Tracts
Percentage of persons: Older than 65 years of age	Higher than 82%
Percentage of persons: With a disability	Higher than 79%
Percentage of persons: Living in group quarters	Higher than 75%

In addition, the percentage of residents earning below poverty level = 13.4% (compared with the average in New Jersey of 10.4%).

Part 3.6: Observations

- Outreach and guidance should be provided for residents, business owners, and property owners for:
 - Properties in or near 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).
- 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.
- Priority for follow-up 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).

²⁶ All supporting data for SVI can be viewed at https://docs.google.com/spreadsheets/d/10zb_Qlg2CgGxb45_fcKiP46swaC16-fORxYTIOiAkP0/edit#gid=1481479799

Part 3: Hazard Identification and Risk Assessment

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 Group rated the hazards as follows:

High Priority

- None

Moderate Priority

- Drought
- Extreme Temperature: Cold & Hot
- High Wind
- Severe Weather – Summer
- Severe Storm – Winter Weather

Low Priority

- Dam Failure
- Earthquake
- Flood
- Wildfire

Two additional hazards were identified but were not considered applicable to the municipality:

- Coastal Erosion & Sea Level Rise
- Levee Failure

Part 4: Mitigation Measures

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*
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- *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 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 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
- 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 Municipal Appendix reflect 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 Municipal Appendix.

Table 14-9 identifies the status of mitigation measures included in the NJ4 HMP. These entries were based on information provided by the Municipal Working Group. In some cases, the NJ4 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 14-9.

Table 14-9: Status of Upper Deerfield Township NJ4 HMP Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # <small>2728</small>
M-1: Identify and pursue outreach and education opportunities to inform municipal residents, businesses, and property owners.	Work-in-progress	Work-in-progress included: <ul style="list-style-type: none"> ▪ Newsletter 2X per year re: flooding status and emergency status and website updates ▪ On-going discussions (e.g., visits from consulting engineer every Tuesday) 	Carried over as part of M-1
M-2: Prioritize critical facilities and complete site and facility surveys to identify vulnerabilities and potential mitigation measures.			
M-3: Prioritize recurrent drainage problem areas and initiate data collection to track unreimbursed damages and related response and recovery expenses.			
M-4: Conduct regular Municipal Working Group meetings.			
M-5: Install permanent backup emergency power generator at Upper Deerfield Municipal Building (CF-1).	Work-in-progress	Looking at reworking existing limited generator capacity to cover other functions using Township funding, e.g., to cover IT, but still pursuing replacement to cover all functions simultaneously.	Carried over as M-2
M-6: Install permanent backup emergency power generator at Fire Station #1 (CF-3).	Completed	Completed in 2019 with Township general funds	N/A
M-7: Install permanent backup emergency power generator at Public Works facility (CF-7).	Not completed, not funded	Township secured mobile generator in 2019 for emergency purposes. It may be possible to install hookups and transfer switch to accommodate need, at least as a temporary measure.	Carried over as M-3

²⁷ Detailed information for identification and implementation of municipal (M-#) mitigation measures is included in Tables 14-10 and 14-11.

²⁸ Detailed information for identification and implementation of multi-jurisdictional (MJ-#) mitigation measures is included in Table 14-12.

Part 4: Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # 2728
M-8: Install permanent backup emergency power generator at C.F. Seabrook Elementary School (CF-16).	Not completed, not funded	Same as M-7	Carried over as M-4
M-9: Install permanent backup emergency power generator at Elizabeth F. Moore Elementary School (CF-17).	Not completed, not funded	Same as M-7	Carried over as M-5
M-10: Install permanent backup emergency power generator at Woodruff Elementary school (CF-18).	Not completed, not funded	Same as M-7	Carried over as M-6
M-11: Install permanent backup emergency power generator at Senior Center (CF-24).	Not completed, not funded	Same as M-7	Carried over as M-7
M-12: Elevate Love Lane between Old Deerfield Pike and railroad tracks.	Completed	Paving project was completed in 2018 with Township funds and state grant funds (NJ Trust / i.e., gas tax funds)	
M-13: Upgrade stormwater management system at the end of Third and Fourth Streets.	Not completed, not funded		Carried over as M-8
M-14: Engineering study to identify floodproofing mechanisms for Township Hall (CF-1).	Work-in-progress	Video produced for all storm drains; engineering is on-going.	Carried over as M-9
MJ-1: Install backup power for Cumberland Regional High School.	Not completed, not funded		Carried over as multi-jurisdictional mitigation measure MJ-1
MJ-2: Alleviate flooding at County Route 540 (East Deerfield Road) between New Jersey Route 77 and Old Burlington Road (closer to Old Burlington Road).	Completed	Paving project completed in 2019 by Cumberland County	N/A
MJ-3: Alleviate flooding on Freesburg Road (NJ Route 77). Most frequent, most impact on the Township, e.g., July 2021 highway closed for 4 hours.	No progress	State has been working but unable to get resolution yet (including working to gain cooperation from local landowner)	Carried over as multi-jurisdictional mitigation measure MJ-2
MJ-4: Alleviate flooding in the Hildreth Track Development. Storm drainage system is outdated	Work-in-progress	Project is more appropriate as a Municipal Mitigation Action. The Township is pursuing NJ Small Cities grant.	Carried over as M-10

Part 4: Mitigation Measures

Mitigation Action, Program, or Project	Status	Comments	Mitigation Measure # <small>2728</small>
MJ-5: Alleviate flooding on County Route 617 (Finley Road) and New Jersey Highway 77.	Work-in-progress	County currently working on drainage and pipe issues	Carried over as multi-jurisdictional mitigation measure MJ-3
MJ-6: Alleviate flooding on New Jersey Highway 77 and Hoover Road.	Completed	State drainage improvements completed in 2018	N/A
MJ-7: Alleviate flooding on Highway 77 between Big Oak and Hoover Road. Drainage pile issue (lower priority)	No progress		Carried over as multi-jurisdictional mitigation measure MJ-4
MJ-8: Alleviate flooding on County Route 606 (Old Deerfield Pike) and County Route 662 (Center Road).	Completed	County paving and drainage improvements completed in 2019.	N/A

Part 4.3: Municipal Mitigation Measures – Identification

Table 14-10 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 NJ4 HMP 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)²⁹ if applicable

Table 14-10 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

²⁹ Section 3: Hazard Identification and Risk Assessment of the CC HMPU Base Plan includes a description of RL and SRL properties.

Part 4: Mitigation Measures

Table 14-10: Upper Deerfield Township Municipal Mitigation Measures Identification

#	Mitigation Action, Program, or Project	Hazard(s)	Goal (s)	Existing or New Structures
M-1	<p><u>Township Mitigation Program</u> – including sustained efforts in cooperation with Cumberland County Office of Emergency Management (CC OEM) to:</p> <ul style="list-style-type: none"> ▪ Conduct outreach and education for residents, businesses, and property owners ▪ Complete critical facility field evaluations to identify potential vulnerabilities and mitigation measures ▪ Compile relevant data regarding hazard impacts ▪ Support regular interactions of the Township Working Group ▪ Seek integration of hazard mitigation with other parallel planning initiatives 	All	Goal #s 1, 2, and 3	All
M-2	Install permanent backup emergency power generator at Upper Deerfield Municipal Building (CF-1).	Power outage due to multiple hazard types.	Goal #4	Existing
M-3	Install permanent backup emergency power generator at Public Works facility (CF-7).	Power outage due to multiple hazard types.	Goal #4	Existing
M-4	Install permanent backup emergency power generator at C.F. Seabrook Elementary School (CF-16).	Power outage due to multiple hazard types.	Goal #4	Existing
M-5	Install permanent backup emergency power generator at Elizabeth F. Moore Elementary School (CF-18).	Power outage due to multiple hazard types.	Goal #4	Existing
M-6	Install permanent backup emergency power generator at Woodruff Elementary school (CF-19).	Power outage due to multiple hazard types.	Goal #4	Existing
M-7	Install permanent backup emergency power generator at Senior Center (CF-25).	Power outage due to multiple hazard types.	Goal #4	Existing
M-8	Upgrade stormwater management system at the end of Third and Fourth Streets.	Flood	Goal #4	Existing
M-9	Completed engineering study to identify floodproofing mechanisms for Township Hall (CF-1).	Flood	Goal #4	Existing
M-10	Alleviate flooding in the Hildreth Track Development via improving outdated storm drainage system	Flood	Goal #4	Existing

Part 4: Mitigation Measures

Part 4.4: Municipal Mitigation Measures – Implementation

Table 14-11 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 criteria³⁰
- Project Type to help determine funding options and implementation mechanisms at the municipal level³¹
- 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 14-11: Upper Deerfield Township Municipal Mitigation Measures Implementation

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-1	Township Mitigation Program	Township OEM and Township Working Group	High	Program	Staff Time	On-going, sustained effort	<ul style="list-style-type: none"> ▪ Identify outreach and education objectives and methods (working with CC OEM) ▪ Set priorities (if necessary) and conduct critical facility field evaluations ▪ Identify schedule for plan updates (including sustained public participation and plan integration efforts)
M-2	Install permanent backup emergency power generator at Upper Deerfield Municipal Building (CF-1).	Township OEM and Public Works Department	High	Back-up Emergency Power Generator	< \$100K	One to three years	<ul style="list-style-type: none"> ▪ Conduct project scoping.³² ▪ Identify funding source(s).
M-3	Install permanent backup emergency power generator at Public Works facility (CF-7).	Township OEM and Fire Department	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	<ul style="list-style-type: none"> ▪ Conduct project scoping.³³ ▪ Identify funding source(s).

³⁰ Section 4: Mitigation Measures of the CC HMPU Base Plan includes a description of evaluation criteria considered by the Municipal Working Group.

³¹ 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.

³² Project scoping for M-2 to include reworking existing limited generator capacity to cover other functions using Township funding, e.g., to cover IT, but still pursuing replacement to cover all functions simultaneously

³³ Project scoping for M-3 through M-7 to include determining feasibility to install hookups and transfer switch for using portable generator(s) to accommodate need, at least as a temporary measure

Part 4: Mitigation Measures

#	Mitigation Action, Program, or Project	Responsible Part(ies)	Priority	Project Type	Estimated Cost (\$)	Target Date	Next Step(s)
M-4	Install permanent backup emergency power generator at C.F. Seabrook Elementary School (CF-16).	Township OEM and School Board	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Same as M-3
M-5	Install permanent backup emergency power generator at Elizabeth F. Moore Elementary School (CF-18).	Township OEM and School Board	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Same as M-3
M-6	Install permanent backup emergency power generator at Woodruff Elementary school (CF-19).	Township OEM and School Board	High	Back-up Emergency Power Generator	< \$100K	One to three years	Same as M-3
M-7	Install permanent backup emergency power generator at Senior Center (CF-25).	Township OEM and Public Works Department	Low	Back-up Emergency Power Generator	< \$100K	Three to five years	Same as M-3
M-8	Upgrade stormwater management system at the end of Third and Fourth Streets.	Township OEM and Public Works Department	High	Private Property Flood Mitigation	\$100K - \$500K	Three to five years	<ul style="list-style-type: none"> ▪ Conduct project scoping. ▪ Identify funding source(s).
M-9	Complete engineering study to identify floodproofing mechanisms for Township Hall (CF-1).	Township OEM and Public Works Department	High	Private Property Flood Mitigation	< \$50K	One to three years	<ul style="list-style-type: none"> • Complete engineering study • Amend Township Appendix to include preferred mechanisms • Identify funding source(s)
M-10	Alleviate flooding in the Hildreth Track Development via improving outdated storm drainage system.	Township OEM and Public Works Department	Moderate	Private Property Flood Mitigation	To be determined as part of initial engineering study	Two to four years	<ul style="list-style-type: none"> • Complete engineering study incorporating results of video survey of drains to determine feasible options.

Part 4: Mitigation Measures

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

- Outreach and guidance should be provided for owners of :
 - Buildings potentially exposed to Dam 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).
- Considerations for prioritizing and conducting 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 Flood and/or Wildfire and should also be considered as candidates for follow-up facility-level evaluations.
 - Priority for follow-up should also be focused on critical facilities housing vulnerable populations, e.g., group homes, related to Extreme Temperature and Severe Weather hazards. For example, determining and documenting (cross referencing the jurisdiction's Emergency Operations Plan) 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).
- Provisions for Plan Maintenance include :
 - Sustain public outreach and participation (including but not limited to targeted outreach and guidance efforts)
 - 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

Part 4: Mitigation Measures

Part 4.5: Multi-Jurisdictional Mitigation Measures

During the Municipal Working Group Work Sessions, the Working Group identified some NJ4 HMP mitigation measures to be carried over, as well as adding new areas of concern, all of 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. These multi-jurisdictional mitigation measures have been compiled in Table 14-12.

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 14-12: Upper Deerfield Township Multi-Jurisdictional Mitigation Measures

#	Problem Description	Hazard(s) Addressed	Goal Addressed	Applies to Existing or New Structures	Potential Partners	Priority
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
MJ-2	Alleviate flooding on Freesburg Road (NJ Route 77).	Flood	Goal #4	Both	Township OEM, Cumberland County DPW, NJ State DOT	High
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
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

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 CC HMPU Base Plan regarding existing authorities, policies, and programs in the County and specific information about the Upper Deerfield Township's participation and continued compliance in the National Flood Insurance Program (NFIP)
- 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 Upper Deerfield Township'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 including the NFIP.

Continuing participation in the NFIP as part of the implementation of the CC HMPU includes:

- Involvement of Floodplain Manager / Administrator during the CC HMPU implementation process
- 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 14-13 compares the results of the Capability Assessment Survey for the County as a whole and Upper Deerfield Township.

Part 4: Mitigation Measures

Table 14-13: Upper Deerfield Township Capability Assessment Survey Results

Metric	Upper Deerfield Township Results (n=4)	Cumberland County "as a whole" Results (n=85)
Position Type: Full-time	50.00%	51.76%
Position Type: Part-time	50.00%	36.47%
Position Type: Volunteer	0.00%	11.76%
Time in Position:		
Time in Position: Less than 1 year	0.00%	12.94%
Time in Position: 1 to 2 years	0.00%	8.24%
Time in Position: 2 to 5 years	25.00%	23.53%
Time in Position: More than 5 years	75.00%	55.29%
Prior Experience:		
Prior Experience: None	25.00%	57.65%
Prior Experience: with hazard mitigation planning	50.00%	31.76%
Prior Experience: with HMA grant administration	25.00%	12.94%
Prior Experience: with floodplain management	25.00%	7.06%
Training / Certifications:		
Training / Certifications: None	50.00%	75.29%
Training / Certifications: for hazard mitigation planning and implementation	0.00%	9.41%
Training / Certifications: for floodplain management	50.00%	15.29%

In general terms, when compared to the sampled individuals from across all the Working Groups, Upper Deerfield Township has:

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

Part 4: Mitigation Measures

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 Upper Deerfield Township Working Group include:

- Flood Damage Prevention Ordinance
- Emergency Operations - Base Plan (2021)
- Master Plan Reexamination Report (2017)³⁴
- Environmental Resource Inventory (2006)³⁶
- Farmland Preservation Plan (adopted 2012, to be updated in 2022)³⁶
- Land Use Development Regulations (2006)
- Land Use Element Plan (2006)
- Open Space and Recreation Plan (2007)³⁶
- Roadway Improvement Map³⁶ (1992)
- Redevelopment Plan (2005)³⁶
- Water and Sewer Master Plan (1991)³⁶
- Zoning Map (2011) ⁷

In addition, the following is status regarding the status of the Flood Damage Prevention Ordinance::

- Current version was adopted in 2016 and is consistent with the most recent FDPO per NJDEP]
- The Floodplain Administrator is the responsible party for enforcement. The individual who currently holds that position is included on the Working Group and has completed the capability assessment survey.
- The document is accessible to the public via internet³⁵.

³⁴ <http://upperdeerfield.com/Planning%20Documents.htm>

³⁵ <https://ecode360.com/5054607>

Part 4: Mitigation Measures

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