

Part 3: Hazard Identification and Risk Assessment

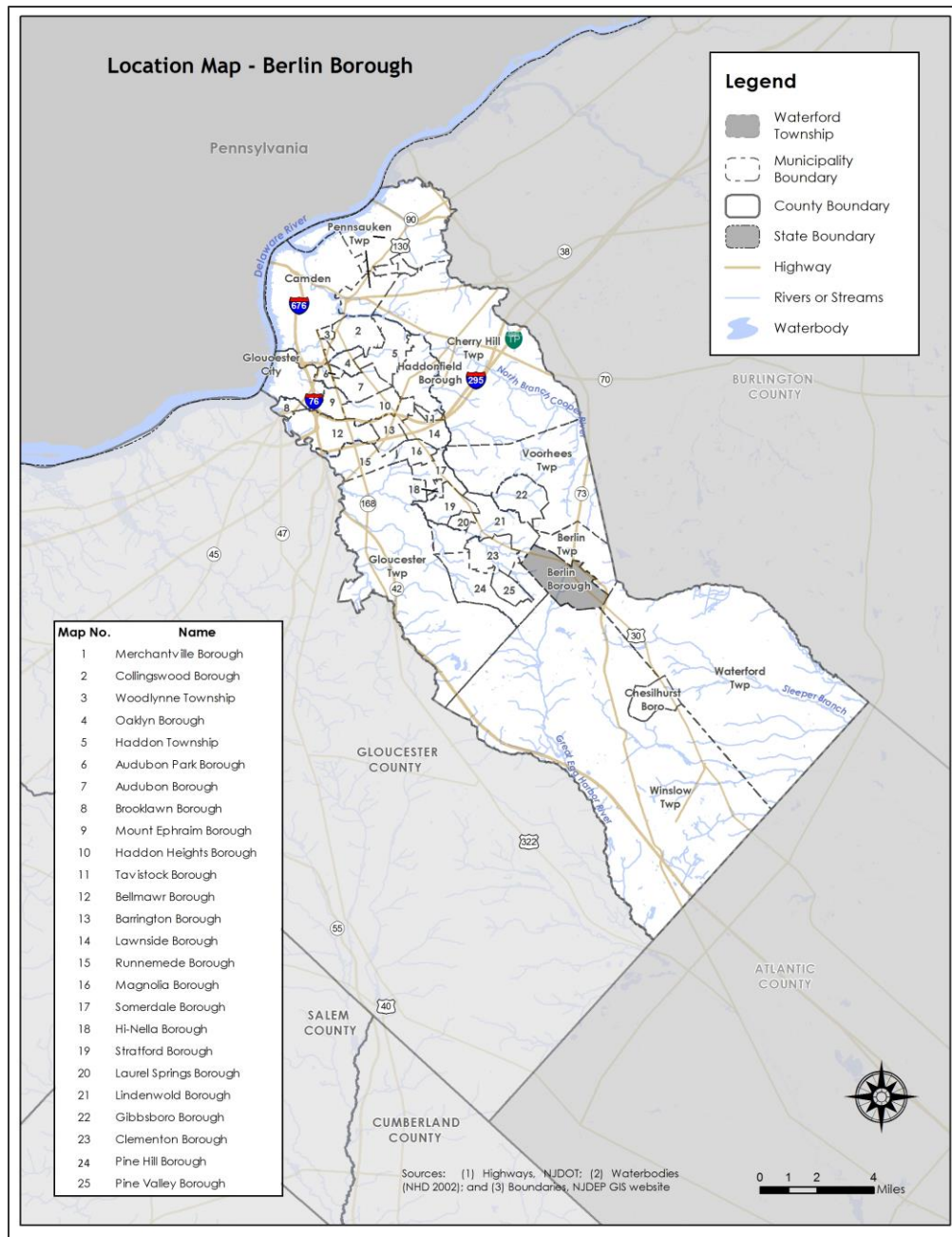
Part 3.1: Municipal Profile

Part 3.1 includes:

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

Berlin Borough is located in the east-central portion of Camden County (See Figure CaC.6-1).

Figure CaC.6-1: Berlin Borough (Camden County) Location Map

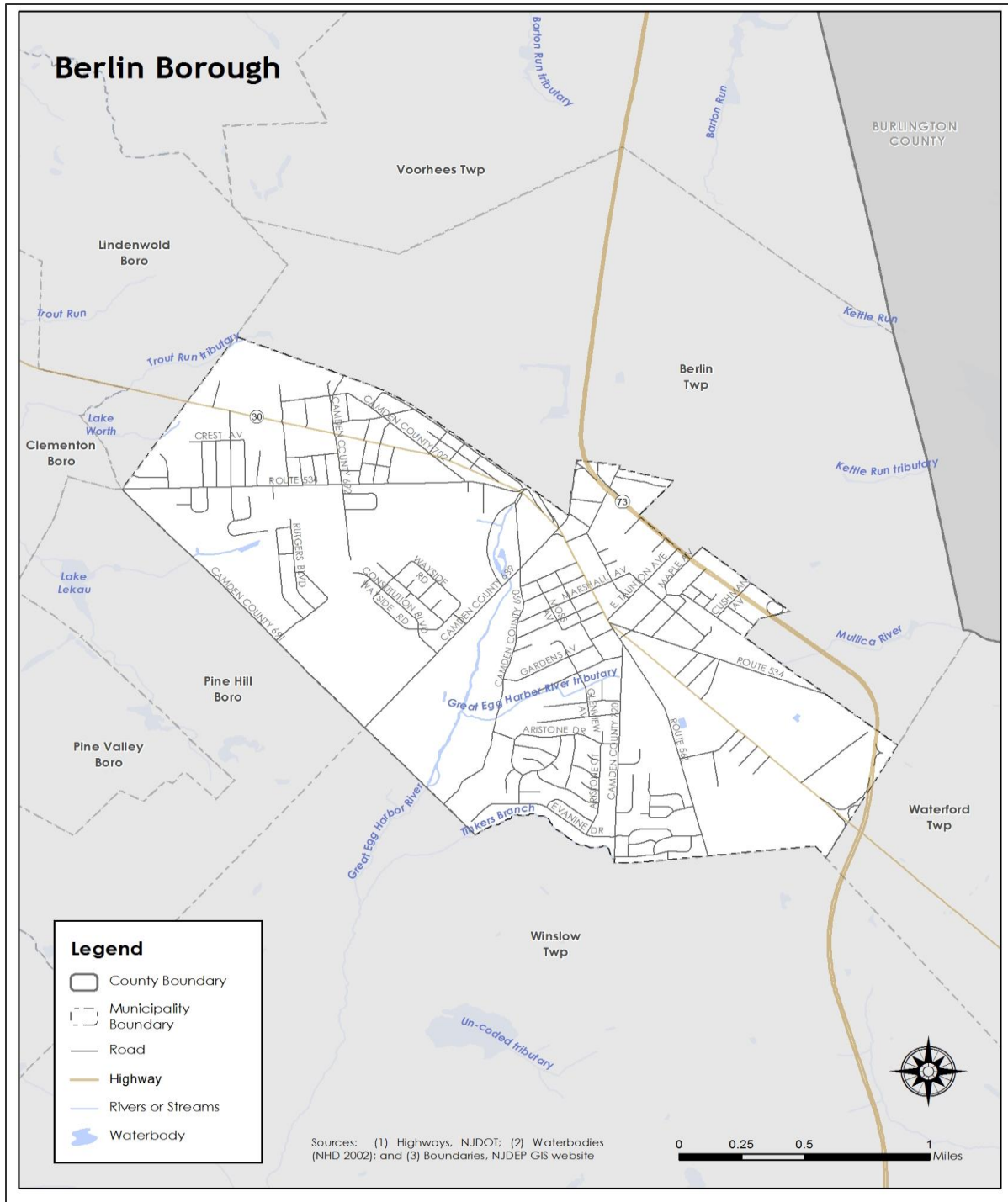


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Berlin Borough is an inland, urban residential community. About 50% of the housing stock was built between 1940 and 1989 and over 35% in the last two decades.

Per Figure CaC.6-2, major water courses include Great Egg Harbor River and Tinkers Branch. Major transportation routes include U.S. Highway 30 and 130. The land is predominantly flat.

Figure CaC.6-2: Berlin Borough Base Map



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In addition, Table CaC.6-3 is a compilation of demographic information for the municipality and comparison with the county, the four county region, and State of New Jersey.

Table CaC.6-3: Berlin Borough Demographics
(Source: Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4)

	Berlin Borough	Camden County	Region	New Jersey
2000 Population	6,149	508,932	974,328	8,414,350
2010 Population	7,588	513,657	1,024,926	8,791,894
Percent Change	23.40%	0.93%	5.19%	4.49%
Population Density	2,114.9 / sq. mile	2,321.5 / sq. mile	754.25 / sq. mile	1,195.5 / sq. mile
Land Area	3.59 sq. miles	221.26 sq. miles	1,358.86 sq. miles	7,354.22 sq. miles
% of Population 18 and younger	22.8	24.4	24.1	23.5
% of Population 18 - 64	60.3	62.8	62.7	63
% of Population 65 and over	16.9	12.8	13.2	13.5

Table CaC.6-4 illustrates how Berlin Borough ranks in the county, the four county region, and New Jersey.

Table CaC.6-4: Berlin Borough County Ranking (Demographics)

	Camden County (total of 37)	Region (total of 90)	New Jersey (total of 566)
Population Rank	17	38	301
Land Area Rank	29	42	284
Population Density Rank	10	49	310
Population Change Rank	1	8	-

Table CaC.6-5 includes information related to economic and housing statistics for Berlin Borough, Camden County, the four county region, and New Jersey.

Table CaC.6-5: Berlin Borough Economics and Housing
(Source: USDA ERS, Census DP-1, 2010 ACS 5 Year Estimates, DP 3, 4; NJ LWD 2010)

	Berlin Borough	Camden County	Region	New Jersey
Date Incorporated	March 29, 1927	1844	-	-
Rural / Urban Status	Urban	Urban	Urban	Urban
Median Household Income	\$65,771	\$60,976	\$60,933	\$69,811
Total Number of Housing Units	2,949	204,943	397,990	3,529,033
Occupied Housing Units	2,806	190,980	372,472	3,176,069
Vacant Housing Units	143	13,963	25,518	352,964
Owner Occupied Housing Units	2,272	130,355	266,593	2,126,279
Renter Occupied Housing Units	534	60,625	105,879	1,049,790

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	Berlin Borough	Camden County	Region	New Jersey
Building Permits	9	487	1,554	13,535
Largest Industry	Educational Services, and health care and social assistance	Educational Services, and health care and social assistance	Educational services, and health care and social assistance	Educational services, and health care and social assistance

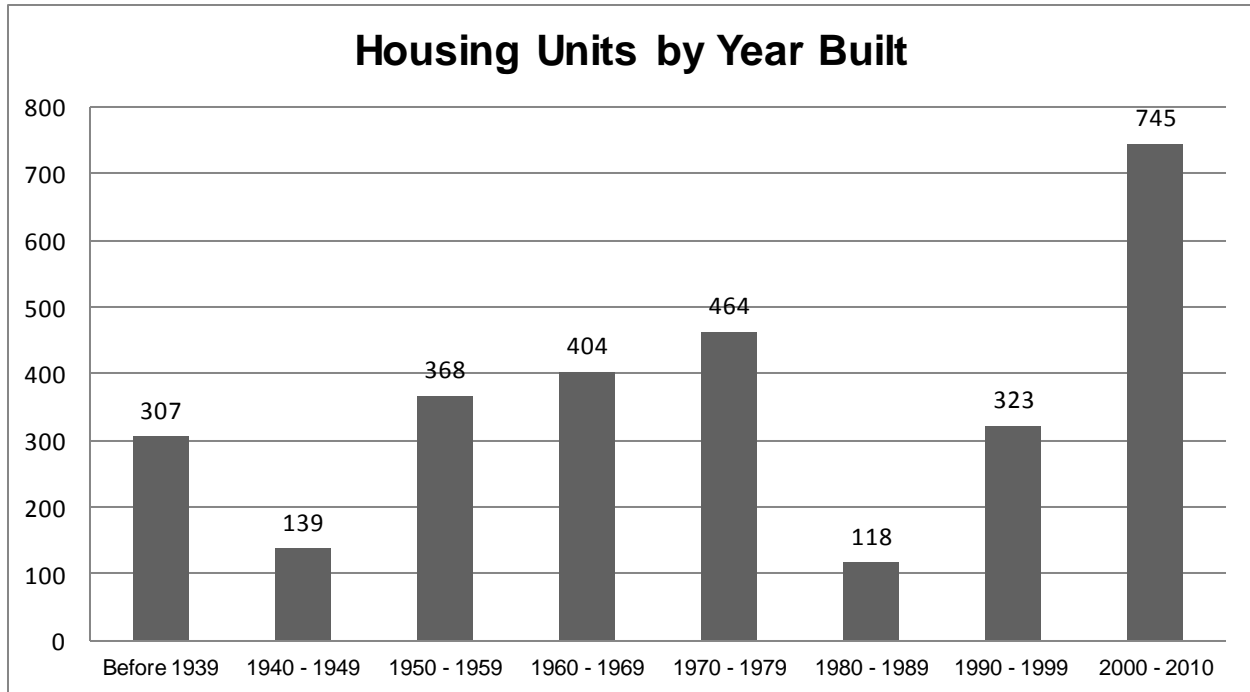
Table CaC.6-6.4 illustrates how Berlin Borough ranks in the county and four county region.

Table CaC.6-6: Berlin Borough Ranking (Economics and Housing)

	Camden County (total of 37)	Region (total of 90)
Median Household Income Rank	13	39
Vacant Housing Rank	20	45
Renter Occupied Housing Rank	21	42
Building Permits Rank	12	35

Figure CaC.6-3 illustrates development patterns in Berlin Borough by examining housing units by year built. About one in four homes in Berlin Borough were built during the 2000s.

Figure CaC.6-3: Berlin Borough Housing Units by Year Built
(Source: 2010 ACS 5 Year Estimates, DP 4)



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Part 3.2: Hazard Priorities

Part 3.2 includes hazard priority determinations per the Municipal Working Group

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

High Priority

- Dam Failure
- Flood
- High Wind
- Severe Weather – Summer
- Severe Weather – Winter

Moderate Priority

- Extreme Temperature: Hot & Cold

Low Priority

- Wildfire
- Drought
- Earthquake
- Geologic Hazards

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

- Coastal Erosion & Sea Level Rise
- Levee Failure

¹ See Section 3: Hazard Identification and Risk Assessment.

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Part 3.3: Hazard Mapping

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

Table CaC.6-7 provides information regarding hazard inventory mapping included in *Section 3: Hazard Identification and Risk Assessment* of the NJ4 HMP Regional Hazard Mitigation Plan that support the Hazard Identification and Risk Assessment (HIRA) for the Municipal Appendix. The indicated maps correspond to high and moderate priority hazards as determined by the Municipal Working Group.

Table CaC.6-7: Supporting Mapping and Exhibits

Figure #	Hazard	Map	HIRA Contribution
Figure RP.3-X	Flood	FEMA Flood Hazard Zones (DFIRM)	Flood Hazard Zones
Figure RP.3-X	Flood	FEMA Flood Hazard Zones Preliminary Work Map (PWM)	Flood Hazard Zones
Figure RP.3-X	Dam Failure	Dam Locations and Hazard Classification	

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Part 3.4: Critical Facilities Inventory and Hazard Exposure Assessment

Part 3.4 includes:

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

Consistent with the process described in Section 3 of the NJ4 HMP Regional Hazard Mitigation Plan, Table CaC.6-8 contains updated inventory information for municipal critical facilities including cross-references to related mitigation measures identified in Part 4 of the Municipal Appendix.

Table CaC.6-9 contains results of overlaying critical facility locations with identified hazard inventory information for use in critical site and facility assessments per Mitigation Measure M-2 (see Part 4 of the Municipal Appendix).

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

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

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

- Drought
- Extreme Temperatures – Cold and Hot

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

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Table CaC.6-8: Berlin Borough (Camden County) Critical Facilities Inventory

CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-1	Emergency Medical Services	EMS	Municipal Station	8 Park Avenue, Berlin		Y	N		M-5
CF-2	Department of Public Works	Public Works	Administrative Office	118 Cross Keys Road, Berlin		N	Y		
CF-3	Police Station	Municipal	Combined Administrative Offices/Correctional Facilities	59 South White Horse Pike, Berlin		N	N		
CF-4	Fire Station	Fire Station	Station	221 Route 30, Berlin		Y	Y		
CF-5	Our Lady of Mt Carmel	Schools	Private School	1 Cedar Avenue, Berlin		Y	N		
CF-6	Berlin Community School	Schools	Public School	215 South Franklin Avenue, Berlin		Y	N		
CF-7	Solid Rock Baptist School	Schools	Private School	420 South Route 30, Berlin		Y	N		
CF-8	Virtua Berlin Hospital	Health Care Facilities	Public Health Clinic / Treatment Centers	100 Townsend Avenue, Berlin		N	Y		
CF-9	Spring Oak Assisted Living	Vulnerable Populations Facilities	Private Assisted Living	396 South White Horse Pike, Berlin		N	N		
CF-10	Rehab & Long Term Healthcare Facility	Health Care Facilities	Private Rehabilitation Center	Long & Cuming Lane, Berlin		N	Y		
CF-11	Community Center	Other Municipal	Community Center	250 South Franklin Avenue, Berlin		Y	N	Serves as a temporary shelter	M-4
CF-12	Berlin United Methodist Nursery	Vulnerable Populations Facilities	Private Child Day Care	151 South White Horse Pike, Berlin		N	N		
CF-13	Carousel Academy	Vulnerable Populations Facilities	Private Child Day Care	189 Watsonstown New Freedom Road, Berlin		N	N		
CF-14	Kids Learning Center	Vulnerable Populations Facilities	Private Child Day Care	158 West White Horse Pike, Berlin		N	N		
CF-15	Our Lady of Mt Carmel School	Vulnerable Populations Facilities	Private Child Day Care	1 Cedar Avenue, Berlin		N	N		

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CF #	Name	Type	Sub-Type	Address	Co-located CF #	Shelter (Y/N)	Generator (Y/N)	Comments	Mitigation Measure #
CF-16	Berlin Community Elementary	Vulnerable Populations Facilities	Public Child Day Care	215 South Franklin Avenue, Berlin		Y	N		
CF-17	Water Treatment Facility	Utilities – Wastewater	Treatment Plants	373 Watson/New Freedom Road, Berlin		N/A	Y		
CF-18	Water Treatment Facility	Utilities – Wastewater	Combined Public Works / Treatment Plants	118 Cross Keys Road & Park Drive, Berlin	CF-2	N/A	Y		
CF-19	Laurel Woods Drive Pump Station	Utilities – Water	Pump Stations	15 Laurel Woods Drive, Berlin		N/A	Y		
CF-20	Jackson Road Pump Station	Utilities – Water	Pump Stations	0 Jackson Road, Berlin		N/A	Y		
CF-21	Smoky Run Drive Pump Station	Utilities – Water	Pump Stations	38 Smoky Run Drive, Berlin		N/A	Y		
CF-22	Lake Worth Drive Pump Station	Utilities – Water	Pump Stations	Overlook Court, Berlin		N/A	Y		
CF-23	Day Avenue Pump Station	Utilities – Water	Pump Stations	301 West White Horse Pike, Berlin		N/A	Y		
CF-24	Cross Keys Road Pump Station	Utilities – Water	Pump Stations	Cross Keys Road & Colonial Park Drive, Berlin		N/A	Y		
CF-25	Carriage Stop Pump Station	Utilities – Water	Pump Stations	Carriage Stop Drive, Berlin		N/A	Y		
CF-26	Enclave Pump Station	Utilities – Water	Pump Stations	Monmouth Avenue, Berlin		N/A	Y		
CF-27	Haverhill Pump Station	Utilities – Water	Pump Stations	220 Cross Keys Road, Berlin		N/A	Y		
CF-28	1.5 MG Elevated Tank	Utilities – Water	Pump Stations	314 Chestnut Avenue, Berlin Township		N/A	N		
CF-29	0.75 MG Elevated Tank	Utilities – Water	Pump Stations	Franklin Avenue, Berlin		N/A	N		

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Table CaC.6-9: Berlin Borough (Camden County) Critical Facilities Hazard Exposure²

CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.02%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-1	Emergency Medical Services	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-2	Department of Public Works	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-3	Police Station	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-4	Fire Station	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-5	Our Lady of Mt Carmel	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-6	Berlin Community School	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-7	Solid Rock Baptist School	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-8	Virtua Berlin Hospital	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-9	Spring Oak Assisted Living	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-10	Rehab & Long Term Healthcare Facility	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-11	Community Center	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-12	Berlin United Methodist Nursery	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-13	Carousel Academy	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-14	Kids Learning Center	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-15	Our Lady of Mt Carmel School	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A

² **Note to Municipal Working Group:** SW LLC will include results for the Critical Facility Exposure Analysis for all hazards in the Draft Municipal Appendix submittal to NJOEM and FEMA. These results will include proximity of critical facilities to high hazard dams and applicable flood zone designations per the most current FEMA Flood Insurance Rate Map (FIRM) information. These results will not alter the existing mitigation measures in Part 4 of this Municipal Appendix but will be the basis for the site and facility assessments to be undertaken by the municipality under Mitigation Measure M-2.

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CF #	Name	Increased Inundation +1 Foot	Increased Inundation +2 Foot	Increased Inundation +3 Foot	Dam Failure	Flood – FIRM Zone V	Flood – FIRM Zone A	Flood – FIRM Zone 0.02%	Storm Surge – Category 1	Storm Surge – Category 2	Storm Surge – Category 3	Storm Surge – Category 4	Levee Failure	Wildfire Wildland High Density Urban Interface	Wildfire Extreme / High Fuel Level Risk
CF-16	Berlin Community Elementary	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-17	Water Treatment Facility	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-18	Water Treatment Facility	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-19	Laurel Woods Drive Pump Station	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-20	Jackson Road Pump Station	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-21	Smoky Run Drive Pump Station	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-22	Lake Worth Drive Pump Station	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-23	Day Avenue Pump Station	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-24	Cross Keys Road Pump Station	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-25	Carriage Stop Pump Station	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-26	Enclave Pump Station	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-27	Haverhill Pump Station	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-28	1.5 MG Elevated Tank	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A
CF-29	0.75 MG Elevated Tank	N/A	N/A	N/A					N/A	N/A	N/A	N/A	N/A	N/A	N/A