SECTION 3E – CONCLUSIONS ON HAZARD RISK

Priority Risk Index

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its guidance document entitled *Local Mitigation Planning Handbook*. It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts; and carefully considers the findings in other relevant plans, studies and technical reports.

In order to draw some meaningful planning conclusions on hazard risk for Atlantic County as a whole and each participating jurisdiction, the hazard profiling and risk assessment processes were used to generate hazard classifications according to a "Priority Risk Index" (PRI) - a tool used to measure the degree of risk for identified hazards in a particular planning area. The purpose of the PRI, described further below, is to categorize and prioritize all potential hazards as high, moderate or low risk. The PRI is used to assist in the determination of those hazards that pose the most significant threat to Atlantic County based on a variety of factors. The PRI is a qualitative assessment methodology meant to be utilized as an objective planning tool for classifying and prioritizing hazard risks based on standardized criteria. Combined with the asset inventory and quantitative vulnerability assessment provided in the previous sections, the summary hazard classifications generated through the use of the PRI allows for the prioritization of those high hazard risks for mitigation planning purposes, and more specifically, the identification of hazard mitigation opportunities for Atlantic County jurisdictions to consider as part of their proposed mitigation strategies. Each jurisdiction focused on the identification of mitigation actions that will reduce or eliminate their own unique hazard risks.

The application of the PRI results in numerical values that allow identified hazards to be ranked against one another (the higher the PRI value, the greater the hazard risk). PRI values are obtained by assigning varying degrees of risk to five categories for each hazard (probability, impact, spatial extent, warning time and duration). Each degree of risk has been assigned a value (1 to 4) and an agreed upon weighting factor[1], as summarized in **Table 3e.1**. To calculate the PRI value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor. The sum of all five categories equals the final PRI value, as demonstrated in the example equation below[2]. According to the weighting scheme applied for Atlantic County, the highest possible PRI value is 4.0.

PRI VALUE = [(PROBABILITY x .30) + (IMPACT x .30) + (SPATIAL EXTENT x .20) + (WARNING TIME x .10) + (DURATION x .10)]

[1] The Atlantic County Planning Committee, based upon any unique concerns or factors for the planning area, may adjust the PRI weighting scheme during future plan updates.

[2] "Hazard Mitigation: Integrating Best Practices into Planning" (available online at www.fema.gov/media-library/assets/documents/19261), prepared by the American Planning Association (APA) and supported through a contract with the Federal Emergency Management Agency (FEMA), discusses the calculation of Priority Risk Indices in Chapter 6 in its case study on the Mecklenburg County Hazard Mitigation Plan (www.charmeckem.net/sites/charmeckem.net/files/HMP/Sections/06_Vulnerability_Assessment.pdf). The Atlantic County HMP Update uses the same PRI calculation and weighting factors.

Table 3e.1 Priority Risk Index for Atlantic County				
PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
Probability	Unlikely	Less than 1% annual probability	1	30%
	Possible	Between 1 and 10% annual probability	2	
	Likely	Between 10 and 100% annual probability	3	
	Highly Likely	100% annual probability	4	
Impact	Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	1	30%
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day.	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.	4	
Spatial Extent	Negligible	Less than 1% of area affected	1	20%
	Small	Between 1 and 10% of area affected	2	
	Moderate	Between 10 and 50% of area affected	3	
	Large	Between 50 and 100% of area affected	4	
Warning Time	More than 24 hours	Self-explanatory	1	10%
	12 to 24 hours	Self-explanatory	2	
	6 to 12 hours	Self-explanatory	3	
	Less than 6 hours	Self-explanatory	4	
Duration	Less than 6 hours	Self-explanatory	1	10%
	Less than 24 hours	Self-explanatory	2	
	Less than one week	Self-explanatory	3	
	More than one week	Self-explanatory	4	

As part of the 2016 Plan Update, the application of the PRI was done for *every* participating jurisdiction. The process was reviewed and results were updated as part of the 2021 Plan Update process, including a reorganization of hazard presentation to align with the overall new presentation of the updated hazard identification step documented of Section 2, and the hazard profiles of Section 3a.

PRI Results

The application of the PRI was done separately for each jurisdiction in Atlantic County, and for the County as a whole. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Planning Committee and results of the vulnerability assessment. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table 3e.2 summarizes the degree of risk assigned to each category for all identified hazards based on the application of the PRI for Atlantic County, as a whole.

Table 3e.3 presents an overview of the PRI Results for each jurisdiction.

Detailed tables for each jurisdiction (similar to Table 3e.2) are included in **Appendix 3e**.

Table 3e.2
Summary of PRI Results for Atlantic County

Hazard	Category/Degree of Risk											
	Probability	PROBABILITY INDEX VALUE	Impact	IMPACT INDEX VALUE	Spatial Extent	SPATIAL INDEX VALUE	Warning Time	WARNING INDEX VALUE	Duration	DURATION INDEX VALUE	PRI Score	Hazard Ranking
Atmospheric Hazards												
Extreme Temperatures	Highly Likely	4	Minor	1	Large	4	More than 24 hours	1	Less than one week	3	2.7	M
Extreme Wind	Highly Likely	4	Limited	2	Large	4	More than 24 hours	1	Less than 24 hours	2	2.9	M
Hail	Highly Likely	4	Minor	1	Negligible	1	Less than 6 hours	4	Less than 6 hours	1	2.2	L
Hurricane & Tropical Storm	Possible	2	Catastrophic	4	Large	4	More than 24 hours	1	Less than one week	3	3.0	H
Lightning	Highly Likely	4	Minor	1	Negligible	1	Less than 6 hours	4	Less than 6 hours	1	2.2	L
Nor'easter	Likely	3	Minor	1	Large	4	More than 24 hours	1	Less than one week	3	2.4	M
Tornado	Possible	2	Catastrophic	4	Negligible	1	Less than 6 hours	4	Less than 6 hours	1	2.5	M
Winter Storm	Highly Likely	4	Minor	1	Large	4	More than 24 hours	1	Less than one week	3	2.7	M
Hydrologic Hazards												
Coastal Erosion	Highly Likely	4	Critical	3	Small	2	More than 24 hours	1	Less than one week	3	2.9	M
Sea Level Rise	Highly Likely	4	Critical	3	Small	2	More than 24 hours	1	More than one week	4	3.0	H
Dam Failure	Unlikely	1	Catastrophic	4	Negligible	1	Less than 6 hours	4	Less than 6 hours	1	2.2	L
Levee Failure	N/A	No recorded levees in Atlantic County										N/A
Drought	Possible	2	Minor	1	Large	4	More than 24 hours	1	More than one week	4	2.2	L
Flood	Highly Likely	4	Critical	3	Moderate	3	6 to 12 hours	3	Less than one week	3	3.3	H
Tsunami	Unlikely	1	Limited	2	Small	2	6 to 12 hours	3	Less than 24 hours	2	1.8	L
Storm Surge	Likely	3	Catastrophic	4	Moderate	3	More than 24 hours	1	Less than one week	3	3.1	H
Wave Action	Highly Likely	4	Critical	3	Small	2	More than 24 hours	1	Less than one week	3	2.9	M
Geologic Hazards												
Earthquake	Unlikely	1	Minor	1	Large	4	Less than 6 hours	4	Less than 6 hours	1	1.9	L
Other Natural Hazards												
Wildfire	Possible	2	Critical	3	Small	2	Less than 6 hours	4	Less than one week	3	2.6	M

Table 3e.3
PRI Results for Each Jurisdiction[3]

Jurisdiction	Atmospheric								Hydrologic								Geologic	Other
	Extreme Temperatures	Extreme Wind	Hail	Hurricane and Tropical Storm	Lightning	Nor' easter	Tornado	Winter Storm	Coastal Erosion	Sea Level Rise	Dam Failure[4]	Drought	Flood	Tsunami	Storm Surge	Wave Action	Earthquake	Wildfire
ATLANTIC COUNTY	2.7	2.9	2.2	3.0	2.2	2.4	2.5	2.7	2.9	3.0	2.2	2.2	3.3	1.8	3.1	2.9	1.9	2.6
Absecon, City of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	2.3	3.0	1.9	2.2	3.0	1.8	3.0	2.5	1.9	2.0
Atlantic City, City of	2.7	2.9	2.2	3.0	2.2	2.7	2.2	2.7	2.7	3.0	N/A	2.2	3.2	2.2	3.0	3.1	1.9	2.0
Brigantine, City of	2.7	2.9	2.2	3.0	2.2	2.7	2.2	2.7	2.7	3.0	N/A	2.2	3.2	1.8	3.0	2.8	1.9	2.0
Buena, Borough of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	N/A	N/A	1.6	2.2	3.1	N/A	N/A	N/A	1.9	2.8
Buena Vista, Township of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	N/A	N/A	N/A	2.2	2.8	N/A	N/A	N/A	1.9	2.5
Corbin City, City of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	2.9	3.0	N/A	2.2	3.0	1.8	3.0	2.3	1.9	2.8
Egg Harbor City, City of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	N/A	3.0	1.6	2.2	3.0	1.8	2.8	N/A	1.9	2.8
Egg Harbor, Township of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	2.9	3.0	2.7	2.2	3.0	2.0	2.8	2.6	1.9	2.8
Estell Manor, City of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	2.9	3.0	1.9	2.2	3.0	1.8	2.8	2.1	1.9	2.8
Folsom, Borough of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	N/A	N/A	1.6	2.2	3.0	N/A	N/A	N/A	1.9	2.8
Galloway, Township of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	2.9	3.0	1.6	2.2	3.0	2.2	2.8	2.5	1.9	2.8
Hamilton, Township of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	N/A	3.0	2.4	2.2	3.0	1.5	2.8	N/A	1.9	2.8
Hammonton, Town of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	N/A	N/A	1.9	2.2	2.8	1.3	1.2	N/A	1.9	2.8
Linwood, City of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	2.9	3.0	1.9	2.2	3.0	2.0	3.0	2.8	1.9	2.0
Longport, Borough of	2.7	2.9	2.2	3.0	2.2	3.0	2.2	2.7	3.0	3.0	N/A	2.2	3.2	2.2	3.0	2.8	1.9	1.8
Margate City, City of	2.7	2.9	2.2	3.0	2.2	3.0	2.2	2.7	3.0	3.0	N/A	2.2	3.2	2.2	3.0	2.6	1.9	1.8
Mullica, Township of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	N/A	3.0	1.9	2.2	3.0	1.5	2.8	N/A	1.9	2.8
Northfield, City of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	2.9	3.0	N/A	2.2	3.0	2.1	2.8	N/A	1.9	2.0
Pleasantville, City of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	2.9	3.0	N/A	2.2	3.0	2.1	2.8	2.3	1.9	2.0

[3] N/A = The hazard was not identified as a significant hazard of concern for the jurisdiction because the footprint of the hazard area is entirely outside of the jurisdictional boundary, as detailed in the hazard profiles of Section 3A.
[4] Levee Failure: Atlantic County has no significant levees recorded, therefore PRI was not done for levee failure

Table 3e.3
PRI Results for Each Jurisdiction[3]

Jurisdiction	Atmospheric								Hydrologic								Geologic	Other
	Extreme Temperatures	Extreme Wind	Hail	Hurricane and Tropical Storm	Lightning	Nor' easter	Tornado	Winter Storm	Coastal Erosion	Sea Level Rise	Dam Failure[4]	Drought	Flood	Tsunami	Storm Surge	Wave Action	Earthquake	Wildfire
Port Republic, City of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	2.9	3.0	1.6	2.2	3.2	1.8	3.0	2.3	1.9	2.8
Somers Point, City of	2.7	2.9	2.2	3.0	2.2	2.4	2.2	2.7	2.9	3.0	N/A	2.2	3.0	2.3	3.0	2.6	1.9	1.8
Ventnor City, City of	2.7	2.9	2.2	3.0	2.2	2.7	2.2	2.7	2.7	3.0	#N/A	2.2	3.2	2.2	3.0	2.3	1.9	2.0
Weymouth, Township of	2.7	2.9	2.2	3.0	2.2	2.7	2.2	2.7	N/A	N/A	2.4	2.2	2.8	1.8	2.8	#N/A	1.9	2.8

Final Determinations

The conclusions drawn from the application of the PRI process for Atlantic County resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk and Low Risk. Hazards with a PRI of 3.0 or more were deemed "high risk"; hazards with a PRI between 2.4 and 2.9 were deemed "moderate risk"; and hazards with a PRI of 2.3 or less were deemed "low risk". For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Atlantic County. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates. **Table 3e.4** presents conclusions on hazard risk for the County as a whole, based on the PRI scores for each hazard in the County. **Table 3e.5** presents an overview of the resultant hazard risk rankings for each jurisdiction. Detailed tables for each jurisdiction are included in **Appendix 3e.1**.

Table 3e.4
Hazard Risk Rankings for Atlantic County

HIGH RISK **PRI ≥ 3.0**	Hurricane and Tropical Storm Flooding Storm Surge Sea Level Rise
MODERATE RISK **2.4 ≤ PRI ≤ 2.9**	Extreme Temperatures Extreme Wind Nor'easter Tornado Winter Storm Coastal Erosion Wave Action Wildfire
LOW RISK **PRI ≤ 2.3**	Hail Lightning Dam Failure Drought Tsunami Earthquake

Table 3e.5
Hazard Risk Rankings for Each Jurisdiction

Jurisdiction	Atmospheric								Hydrologic								Geologic	Other
	Extreme Temperatures	Extreme Wind	Hail	Hurricane and Tropical Storm	Lightning	Nor' easter	Tornado	Winter Storm	Coastal Erosion	Sea Level Rise	Dam Failure	Drought	Flood	Tsunami	Storm Surge	Wave Action	Earthquake	Wildfire
ATLANTIC COUNTY	M	M	L	H	L	M	M	M	M	H	L	L	H	L	H	M	L	M
Absecon, City of	M	M	L	H	L	M	L	M	L	H	L	L	H	L	H	M	L	L
Atlantic City, City of	M	M	L	H	L	M	L	M	M	H	N/A	L	H	L	H	H	L	L
Brigantine, City of	M	M	L	H	L	M	L	M	M	H	N/A	L	H	L	H	M	L	L
Buena, Borough of	M	M	L	H	L	M	L	M	N/A	N/A	L	L	H	N/A	N/A	N/A	L	M
Buena Vista, Township of	M	M	L	H	L	M	L	M	N/A	N/A	N/A	L	M	N/A	N/A	N/A	L	M
Corbin City, City of	M	M	L	H	L	M	L	M	M	H	N/A	L	H	L	H	L	L	M
Egg Harbor City, City of	M	M	L	H	L	M	L	M	N/A	H	L	L	H	L	M	N/A	L	M
Egg Harbor, Township of	M	M	L	H	L	M	L	M	M	H	M	L	H	L	M	M	L	M
Estell Manor, City of	M	M	L	H	L	M	L	M	M	H	L	L	H	L	M	L	L	M
Folsom, Borough of	M	M	L	H	L	M	L	M	N/A	N/A	L	L	H	N/A	N/A	N/A	L	M
Galloway, Township of	M	M	L	H	L	M	L	M	M	H	L	L	H	L	M	M	L	M
Hamilton, Township of	M	M	L	H	L	M	L	M	N/A	H	M	L	H	L	M	N/A	L	M
Hammonton, Town of	M	M	L	H	L	M	L	M	N/A	N/A	L	L	M	L	L	N/A	L	M
Linwood, City of	M	M	L	H	L	M	L	M	M	H	L	L	H	L	H	M	L	L
Longport, Borough of	M	M	L	H	L	H	L	M	H	H	N/A	L	H	L	H	M	L	L
Margate City, City of	M	M	L	H	L	H	L	M	H	H	N/A	L	H	L	H	M	L	L
Mullica, Township of	M	M	L	H	L	M	L	M	N/A	H	L	L	H	L	M	N/A	L	M
Northfield, City of	M	M	L	H	L	M	L	M	M	H	N/A	L	H	L	M	N/A	L	L
Pleasantville, City of	M	M	L	H	L	M	L	M	M	H	N/A	L	H	L	M	L	L	L
Port Republic, City of	M	M	L	H	L	M	L	M	M	H	L	L	H	L	H	L	L	M

Table 3e.5
Hazard Risk Rankings for Each Jurisdiction

Jurisdiction	Atmospheric								Hydrologic								Geologic	Other
	Extreme Temperatures	Extreme Wind	Hail	Hurricane and Tropical Storm	Lightning	Nor' easter	Tornado	Winter Storm	Coastal Erosion	Sea Level Rise	Dam Failure	Drought	Flood	Tsunami	Storm Surge	Wave Action	Earthquake	Wildfire
Somers Point, City of	M	M	L	H	L	M	L	M	M	H	N/A	L	H	L	H	M	L	L
Ventnor City, City of	M	M	L	H	L	M	L	M	M	H	N/A	L	H	L	H	L	L	L
Weymouth, Township of	M	M	L	H	L	M	L	M	N/A	N/A	M	L	M	L	M	N/A	L	M

Key Risk Findings

Key Risk Findings are problem statements arising from the risk assessment by each participating jurisdiction. Each jurisdiction was encouraged to consider different types of mitigation actions for addressing their highest hazards and Key Risk Findings.

Key Risk Findings for Atlantic County (as determined by the Atlantic County JAT) are presented in **Table 3e.6**. Key Risk Findings reported by each individual jurisdiction are included in **Appendix 3e**.

Table 3e.6 Key Risk Findings for Atlantic County
The current configuration of the intersection and roadway allows for flooding on regular tidal events and during larger storms prevents evacuation of the Ventnor Heights and Chelsea Heights neighborhoods.
Pump station is critical in removal of flood water in the communities of Ventnor and Margate. Storm water system is antiquated and has produced multiple failures of the system resulting in flooded streets and residential/commercial properties in Ventnor and Margate and surrounding areas.
By ensuring that local plans incorporate natural disaster techniques the risks to people and property could be reduced from hazards such as hurricanes, tropical storms, flooding, storm surge, nor'easters, coastal erosion, etc. Hazard mitigation techniques in local comprehensive plans can provide improved life safety and protection of property in communities.
Prevent risks from increasing if local planning and zoning decisions are made without consideration of natural hazard and mitigation techniques.
Keeping new and updated development in line with the Hazard Mitigation Plan Strategies.
The general public's understanding of natural hazards and preparedness and mitigation possibilities could be improved. The planning area's overall level of disaster resistance would increase if a greater number of households had a thorough understanding of their risks and things they can do to reduce these risks.
Local codes & ordinances can be updated to address natural disaster mitigation techniques or, if already included, they can be re-evaluated to improve upon or expand the mitigation approach.
The community's overall level of disaster resistance would increase if hazard mitigation principles were more closely aligned with day-to-day operations and activities.