

Repetitive Loss Area Analysis Ventnor, NJ



Prepared by Rutala Associates

January 2023

Table of Contents

Introduction	3
Background	4
Study Methodology, Results, and Analysis	6
Step 1: Project Notification	6
Step 2: Contact Other Agencies	6
Step 3: Collect Data	20
Step 4: Consider Mitigation Alternatives	20
Step 5: Document the findings	22
Area 1: Ventnor Gardens	22
Existing Conditions.....	22
Mitigation Projects.....	22
Area 2: Oceanfront	22
Existing Conditions.....	22
Mitigation Projects.....	23
Area 3: Upper Thorofare	23
Existing Conditions.....	23
Mitigation Projects.....	23
Area 4: Northeast Ventnor	23
Existing Conditions.....	23
Mitigation Projects.....	23
Area 5: Ventnor Heights (South)	23
Existing Conditions.....	23
Mitigation Projects.....	24
Area 6: Ventnor Heights (North)	24
Existing Conditions.....	24
Mitigation Projects.....	24
Repetitive Loss Area Summary	24
Current Private Mitigation Projects	25
Recommendations, Alternatives, and Updates	26
References	28
Appendix	29
Table 1: Base Flood Elevations and Transects for Ventnor.....	6
Table 2: Survey Dates.....	8
Table 3: Summary of Plans and Ordinances for the City of Ventnor.....	12
Table 4: Ventnor Projects Identified in the Atlantic County Flood Control Study.....	15
Table 5: Planning Contacts.....	16

Introduction

The purpose of this analysis is to identify neighborhood-based priorities and to further actions that will result in funding for prioritized mitigation projects.

To accomplish this goal, we have prepared Repetitive Loss Area Analysis (RLAA) for credit under Activity 510 (Floodplain Management Planning) of the Community Rating System. A RLAA is a mitigation plan for areas that have or are expected to experience repetitive losses from flooding. The purpose of an RLAA is to generate mitigation solutions for individual buildings or areas, in contrast to a hazard mitigation or floodplain management plan, which examines community-wide flooding problems and solutions.

The Community Rating System, administered by the Federal Emergency Management Agency, rewards proactive and voluntary floodplain management activities undertaken by the City with discounts on flood insurance premiums. A Repetitive Loss Area Analysis is a creditable activity for the Community Rating System. The repetitive loss area encompasses various sections of Ventnor's neighborhoods. The areas were determined by the concentration and distribution of repetitive loss properties and properties with substantial historic flood claims.

When an insurable building suffers flood damage with damage claims totaling more than \$1,000 over a given ten-year period, a property becomes a repetitive loss property. A severe repetitive loss property is one that is covered by the National Flood Insurance Program that has had at least four claim payments over \$5,000 (with a cumulative amount over \$20,000) or had received two separate claim payments for the building with the cumulative amount exceeding the market value of the building. From an actuarial perspective, these buildings are expensive to insure. Despite comprising less than one percent of all insured properties, severe repetitive loss properties account for over a quarter of flood claims nationwide. Eliminating or mitigating damage to repetitive loss structures is important for ensuring an area's vitality and for reducing the financial burden of flood losses.

The City of Ventnor has a total of 183 repetitive loss properties, a significant decrease in total homes from past years. This is due to the constant redevelopment of the island and existing homeowners elevating their homes. Of this total 21 properties are classified by FEMA as severe repetitive loss properties.

Ventnor's repetitive loss areas are marked predominantly by mid-century residential properties that were not constructed to floodplain management standards and have significant exposure to current and future flooding. The concentration of at-risk properties in the neighborhood resulted in the City mapping six areas of concentrated losses as a repetitive loss area pursuant to Activity 500 of the Community Rating System. A repetitive loss area includes properties that both are and are not repetitive losses and supports generalized analysis of the neighborhood to protect the confidentiality of individual flood

insurance information. A map of the repetitive loss area can be found in Appendix 4 of this report.

As with a floodplain management plan prepared for FMP (floodplain management planning) credit under the Community Rating System (CRS), an RLAA requires that your community follow a standard planning process. The RLAA process has five planning steps as compared to a more detailed 10-step process for a floodplain management plan. Depending on the number of repetitive loss properties, an RLAA will require more data-specific detail about buildings within the defined areas subject to repetitive losses. The RLAA can provide up to 140 points of credit under Activity 510. We will follow the prescribed five step process:

- 1) Notification of properties in the repetitive loss area via direct mailing.
- 2) Analyze plans or studies by outside agencies.
- 3) Perform a site visit of buildings in the repetitive loss area.
- 4) Review approaches to mitigating flood risk and protecting properties.
- 5) Document the findings in a report.

Once the report is finalized and in draft form, it will be made available on the City's web site so the owners of the properties in the repetitive loss areas can review and comment. Once comments are received and revisions incorporated, the RLAA must be adopted by the governing body.

Background

Ventnor City is a coastal settlement located on the eastern border of Atlantic County, right along the Atlantic Ocean. Named after an English seaside resort, Ventnor has historically been a recreation destination due to its close proximity to Atlantic City and pristine vistas and beaches.

The close proximity to both the Atlantic ocean and the various canals of Lakes Bay make the area highly susceptible to flooding and repetitive loss. Neighborhoods in Ventnor are low-lying and vulnerable to flooding from storm surge and tidal flooding.

The floodplain management planning process identified six repetitive loss areas in Ventnor. The repetitive loss areas comprise all of Ventnor's identified repetitive loss properties. These areas are shown on the following map and include the following (discussed in greater detail in the following sections):

- 1) Ventnor Gardens- This area consists of predominately single-family homes at the Western portion of Ventnor.
- 2) Oceanfront- This area is comprised of several beachfront homes along Ventnor's Southern border with the Atlantic Ocean.
- 3) Upper Thorofare- This area includes structures located along the Southern edge of the Inside Throughfare canal.

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- 4) Northeast Ventnor- This area includes many residential buildings and docks located along the Southern edge of the Inside Throughfare on Ventnor's East Side.
- 5) Ventnor Heights (North)- This repetitive loss area includes a handful of residential and commercial properties on the Northern shore of the Inside Throughfare.
- 6) Ventnor Heights (South)- This area includes additional single-family homes in the most Northern portion of Ventnor.

Map 1: Repetitive Loss Areas of Ventnor



Study Methodology, Results, and Analysis

The repetitive loss study was conducted using the five-step process described in the CRS Coordinator's Manual. These steps include:

- Step 1: Advise all properties of repetitive loss area status.
- Step 2: Contact agencies or organizations that have plans or studies pertaining to flooding. (Completed as part of the Floodplain Management Planning Process)
- Step 3: Visit each building in the repetitive loss area and collect basic information.
- Step 4: Review alternative approaches and determine whether any property protection measures, or drainage improvements are feasible.
- Step 5: Document the findings.

Rutala Associates conducted site visits on the dates listed in the table below. No abnormal tidal conditions were observed during the survey dates.

The site visits consisted of taking pictures of identified repetitive loss area properties and documenting the foundation type, whether flood vents were present, and whether mitigation measures were in place. Detailed building information was not available for this study because the Survey did not have access to detailed building data and did not undertake detailed property inspections. Property surveys were limited in detail to what could be obtained visually in the public right-of-way. For a number of properties, ground-level vegetation or building orientation prevented the identification of the presence of flood vents.

The Repetitive Loss Area includes approximately 430 properties. The number of structures was determined based on May 2019 property tax records, the list of unmitigated repetitive loss properties in Ventnor, and a list of per-property flood insurance claims. Twenty properties were found to have no buildings on-site at the time of survey.

Step 1: Project Notification.

A notice to property owners notifying them of the analysis and providing an email address to which to send flood-related comments and observations was mailed in late May 2019. An additional mailing comprising an expanded repetitive loss area was mailed in late June 2019. Copies of these notices are found in Appendix 1.

Step 2. Contact Other Agencies.

Agencies and organizations that have plans, studies, or reports that may discuss the causes of flooding must be contacted during the planning process, whether they are outside the community or within it. Each agency, organization, or department must be cited in the analysis along with the type of information utilized. Below is a summary of reports and updates provided by agencies and organizations that have studied the City of Ventnor.

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FEMA Atlantic County Flood Insurance Study, 2014

This Flood Insurance Study (FIS) aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This FIS has developed flood risk data for various areas of Atlantic County that will be used to establish actuarial flood insurance rates. This information will also be used by Atlantic County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP) and will also be used by local and regional planners to further promote sound land use and floodplain development.

The FIS was prepared to include all jurisdictions within Atlantic County in a countywide format. Information on the authority and acknowledgments for each jurisdiction included in this countywide FIS, as compiled from their previously printed FIS reports. For the City of Ventnor, the wave height analysis from the FIS report dated March 15, 1983, was prepared by Dewberry & Davis for FEMA. That work was completed in September 1982.

The following figure is derived from the Flood Insurance Study undertaken for Cape May in 2017. This identifies the most recent flood data for various locations in the City.

Table 1: Base Flood Elevations and Transects for Ventnor, NJ

Flood Source	Transect		Starting Wave Conditions for 1% Annual Chance		Starting Stillwater Elevations Range of Stillwater Elevations (ft NAVD88)			
	#	Coordinates	Significant Wave Height	Peak Wave Period	10%	2%	1%	0.2%
Atlantic Ocean	26	N 39.351182 W 74.442808	10.39	13.35	6.6 5.9 – 8.2	8.8 7.8- 9.2	9.3 8.5- 10.4	12.9 10- 13.6
Atlantic Ocean	27	N 39.346907 W 74.452940	10.43	13.01	6.4 5.8- 7.9	8.4 7.7- 9.3	9.4 8.4- 10.5	12.9 9.9- 13.8
Atlantic Ocean	28	N 39.341837 W 74.464620	10.96	13.59	6.3 5.6- 6.8	8.4 7.6- 9.2	9.3 8.2- 10.0	12.9 9.6- 13.5
Atlantic Ocean	29	N 39.337061 W 74.474988	11.20	13.52	6.4 5.7- 8.2	8.4 7.5- 9.5	9.3 8.2- 10.7	13.0 9.6- 13.5
Atlantic Ocean	30	N 39.332316 W 74.486057	11.51	13.56	6.4 5.7- 8.1	8.5 7.4- 8.6	9.4 8.2-9.5	13.0 9.6- 13.3

NFIP- Community Rating System

The City's records show that there were 87 repetitive-loss (RL) properties in Ventnor in 2018, this is down from 158 RL properties in 2016. A property is considered a repetitive-loss property when there are two or more losses reported that were paid more than \$1,000 for each loss. The two losses must be within 10 years of each other and be at least 10 days apart. Only losses from January 1, 1978, that are closed are considered.

The City has been actively involved in the NFIP's Community Rating System and is a statewide leader. The City currently has a Class 5 rating, which provides for a 25 percent discount on flood insurance. More than 1,200 communities nationwide, including 61 in New Jersey, participate in the CRS. Only a dozen communities are in Class 5, the highest ranking for any community in the State of New Jersey. Currently only Roseville, California is in Class 1 which receives a 45 percent insurance discount.

The CRS recognizes and encourages community floodplain management activities that exceed the minimum NFIP standards. In addition to the benefit of reduced insurance rates, CRS floodplain management activities enhance public safety, reduce damage to property and public infrastructure, avoid economic disruption and losses, reduce human suffering, and protect the environment. Participating in the CRS provides an incentive to maintain and improve a community's floodplain management program over the years. Implementing some CRS activities can help projects qualify for certain other federal assistance programs. Participating communities can earn credit for undertaking a variety of flood-reduction measures, including preserving open space, mandating that buildings in flood zones be elevated higher than FEMA requires, and incorporating predictions of future sea-level rise into their regulatory maps. Overall, creditable activities are grouped into four categories: public information, mapping and regulations, flood damage reduction, and warning and response. Different amounts of points are awarded for different measures, as explained in the FEMA manual.

US Army Corps of Engineers Involvement

Shore Protection

Throughout the Jersey Shore, the US Army Corps, NJDEP Division of Coastal Engineering, and local municipalities partner for periodic beach replenishments. In this process, sand is pumped from offshore locations onto eroding coastlines and is graded to meet a design height. After the initial beachfill, the project is maintained cyclically. Dunes have been effective in protecting property on the landward side of the dune and for re-creating the typical barrier island habitat and its inherent shore protection qualities.

The current USACE Beach Nourishment Program for Absecon Island includes a dune to elevation 14.75 feet for Atlantic City and 12.75 for the Downbeach communities of Ventnor, Margate, and Longport. Potential threats are erosion and inundation in the shoreline and subsequent erosional losses along the shoreline and related natural habitats. The existing

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Beach Nourishment Program has helped address shoreline losses caused by storm surge to the shoreline. Continued implementation of the Beach Nourishment Program, in concert with dune maintenance and restoration, will improve resilience against wave action, storm surge, and other flood impacts along Absecon Island.

New Jersey Back Bays Coastal Storm Risk Management Study

The U.S. Army Corps of Engineers has released a draft report for the New Jersey Back Bays Coastal Storm Risk Management Study in 2021. The report outlines a ‘Tentatively Selected Plan’ framework, which includes three storm surge barriers, two cross-bay barriers, and the elevation of more than 18,000 structures to reduce the risk of flood damage associated with storm surge. It is important to note that the plan is subject to change. It has not yet been approved by higher authorities, including Congress, and has not been funded for implementation at the federal or state level. The Corps plans to release the final report in the Spring/Summer of 2023.

The Army Corps, in partnership with New Jersey Department of Environmental Protection, is conducting the feasibility study within the New Jersey Back Bay area, defined as the network of interconnected tidal water bodies in Monmouth, Ocean, Atlantic, Burlington and Cape May Counties, located landward of the New Jersey ocean coastline. The study area includes approximately 950 square miles and nearly 3,400 miles of shoreline. The objective of the study is to investigate problems and solutions to reduce damage from coastal storm-related flooding that affects population, critical infrastructure, property, and ecosystems. Engineering and economic analyses indicate the study area could experience \$1.8 billion in average annual flood damage if no action is taken.

The draft report presents findings, technical analyses, and outlines the Tentatively Selected Plan. The document describes engineering, economic, social, and environmental analyses. The Tentatively Selected Plan includes the following conceptual features:

- Storm surge barriers at Manasquan Inlet, Barnegat Inlet, and Great Egg Harbor Inlet
- Cross-bay barriers along Absecon Boulevard/Route 30 in Atlantic County and along an extension of 52nd Street in Ocean City/Upper Township in Cape May County.
- Elevating 18,800 structures (including homes and businesses) in Monmouth (135 structures), Ocean (8567 structures), Burlington (66 structures) Atlantic (1491 structures), and Cape May (8579 structures) counties. (Note: there are approximately 182,000 structures in study area)
- Other non-structural measures and natural and nature-based features (such as enhancing marshes or creating living shorelines) could be added to the plan in the future.

The Ventnor City Commissioners has passed a resolution in general support of the finding of the Back Bay Study and a willingness to work with the Corps to refine this report. The

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cross-bay barriers along Absecon Boulevard coupled with the surge barrier at the Great Egg Harbor Inlet are designed to protect Absecon Island.

New Jersey Coastal Engineering Projects/Shore Protection Program

Ventnor is within the State of New Jersey's CAFRA (Coastal Area Facility Review Act) Zone, which includes regulations for a variety of developments in the coastal zone. The state also regulates coastal wetlands, waterfront development, and provides consistency determinations for federally funded projects. The NJDEP also undertakes shore protection projects such as beach nourishment and construction/maintenance of shore protection structures throughout the State.

Resilient New Jersey

The New Jersey Department of Environmental Protection has completed the Atlantic County Coastal Region Resilience and Adaptation Action Plan to serve as a guide for future investment in mitigation projects. The Atlantic County Coastal Region—includes Atlantic City, Brigantine, Longport, Margate, Northfield, Pleasantville, Ventnor, Atlantic County, and the American Red Cross. The Plan outlines Preferred Scenario actions categorized to address the variety of challenges and opportunities for a more resilient region: Shoreline Protection, Power and Communication, Access and Transportation, Stormwater Management, Equitable Economic Development, and Vulnerable Populations and Public Facilities. This report includes several recommendations including raising Wellington Avenue to maintain this viability as an evacuation route, additional pump stations to help address low-lying areas, and restoring Shelter Island with the use of dredge material.

Ventnor City “Getting to Resilience” Recommendations Report, 2015

The Getting to Resilience (GTR) Report was originally developed and piloted by the New Jersey Department of Environmental Protection's Office of Coastal Management in an effort to foster municipal resiliency in the face of flooding, coastal storms, and sea level rise. The Getting to Resilience process was later adapted by the Coastal Training Program of the Jacques Cousteau National Estuarine Research Reserve (JC NERR), converted into a digital format, and placed on an interactive website. This report summarizes several recommendations on outreach, mitigation, municipal organization, FEMA mapping, Sustainable Jersey, and Planning.

Atlantic County Multi-Hazard Mitigation Plan, 2021

Mitigation plans form the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. The planning process is as important as the plan itself. It creates a framework for risk-based decision making to reduce damage to lives, property and the economy from future

disasters. Hazard mitigation is sustained action taken to reduce or eliminate long-term risk to people and their property from hazards.

Table 4: Ventnor Projects Identified in the Atlantic County Multi-Jurisdictional Natural Hazard Mitigation Plan, 2021

Location	Action	Cost	Description
Winchester Avenue	Fully Funded	\$1,976,605	Bulkhead Replacement
Wellington Avenue	Proposed	\$5,000,000	Raise road elevation
Little Rock & Fremont Avenues	Proposed	\$1,500,000	New Pump Station
Derby & Marshall Avenues	Proposed	\$1,500,000	New Pump Station
Lafayette Avenue, City Yard, Fulton & Harvard Avenues, Fremont & Little Road	Proposed	\$200,000 each	Emergency Generators
City Wide Early Warning System	Proposed	\$500,000	Sirens and Public Address System
Lafayette Avenue, Fulton & Harvard, City Yard	Proposed	\$500,000 each	Elevate & recondition pump stations
Lower Ventnor Heights	Design	\$5,000,000	Pump stations, bulkheads, etc.
City Wide	Proposed	\$250,000	Inspect all check valves and replace where needed
City Wide	Proposed	\$1,500/lf	Close bulkhead gaps where needed
City Wide	Underway	\$200,000 each	Secure FEMA funds for home elevations

Atlantic County Flood Control Study 2007

The Atlantic County Flood Hazard Inventory identifies recurring flooded roadways. Each flood hazard mitigation project identified in this study is given a score of up to 100 points based on three major criteria: emergency travel factors – whether it is a major evacuation route (45 possible points); daily travel factors – traffic counts, population served, etc.; and cost-effectiveness feasibility–estimated cost/traffic volumes.

Local Flood Protection Efforts

The purpose of this review is to present the findings of a review of the City’s planning reports and appropriate development ordinances to identify what Ventnor either has done or proposes to do to address flood hazards. The materials reviewed were:

- City of Ventnor Master Plan
- Margate/Ventnor Bicycle and Pedestrian Master Plan
- Floodplain Damage Prevention
- Land Use Regulations
- Stormwater Control
- NFIP Community Rating System
- Atlantic County Multi-Hazard Mitigation Plan, 2021
- The Community Plan Checklist includes a list of municipal documents that may be helpful in developing a Strategic Recovery Planning Report.

Table 3: Summary of Plans and Ordinances for the City of Ventnor

Plans, Ordinances, and Codes	Yes	No	Adopted Year	Update Frequency
Municipal Master Reexamination	x		2016	6 to 10 years
Vision Plan		x		
All-Hazard Mitigation Plan	x		2021	County Adopted
Floodplain Management Plan	x		2013	

Plans, Ordinances, and Codes	Yes	No	Adopted Year	Update Frequency
Evacuation Plan	x			
Emergency Response Plan	x		1981	
Long Term CIP		x		5 Year Plan Prepared
Post-Disaster Recovery Plan		x		
Economic Development Plan	x		2018	
Open Space Plan	x		2018	
Stormwater Management Plan	x			Update Frequency
Historic Preservation Plan		x		
Zoning Ordinance	x		1999	As Needed
Subdivision Ordinance	x		2011	As Needed
Building Code	x		1980	
NFIP Flood Damage Prevention Ordinance	x		2012	
Cumulative Substantial Damage		x		
Greater than One Foot Freeboard	x		2012	
Bulkhead Ordinance	x			
Beach Management Plan	x		2018	

A significant amount of public outreach was undertaken for the Floodplain Management Plan and Repetitive Loss Area Analysis. In addition to public meetings and planning committee meetings, the planning team engaged a number of agencies to determine their interest and activities in Ventnor vis-à-vis floodplain management. A number of these agencies responded and provided useful guidance and information for the project.

All e-mails exchanged with this planning process are attached as an Appendix to the Floodplain Management Plan. The table below summarizes the extent of contact between the Planning Team and outside agencies.

Table 5: Planning Contacts

Agency	Contact	Contact Dates (Phone/Email)	Notes
<i>American Littoral Society</i>	Tim Dillingham Executive Director 732-291-0055 tim@littoralsociety.org	E-Mail sent to Agency on June 24, 2019. No response received.	
<i>American Red Cross-South Jersey</i>	Carol Cohen Executive Director 609-646-8330 carol.cohen@redcross.org	E-mail	The American Red Cross is not undertaking mitigation projects but is participating in preparedness training and offers programming related to disaster response.
<i>Atlantic City Electric Company</i>	ACBrigReliability@exeloncorp.com	E-Mail: Response June 24, 2019	ACEC is planning a new substation at Harbor Beach and is submitting it for Planning Board review in the fall. ACEC can provide building specifications once submitted for review. The substation will conform to the City's flood ordinance.

Agency	Contact	Contact Dates (Phone/Email)	Notes
<i>Atlantic County Departme nt of Regional Planning</i>	<i>John Peterson Department Head (609) 645-5898 peterson_john@aclink.o rg.</i>	E-Mail: Response June 24, 2019	Atlantic County does not have plans for resilience projects but is interested in participating in planning efforts and attending floodplain management meetings. The County asked to be included in announcements and invitations.
<i>Atlantic County- OEM</i>	Vincent J. Jones III Director (609) 407-6742 jones_vincent@aclink.o rg	E-Mail sent to Agency on June 24, 2019. No response received.	
<i>Ventnor Green Team</i>	Ventnorbeachgreentea m@outlook.com	E-Mail sent to Agency on June 24,2019. No response received.	
<i>Builders League of South Jersey</i>	Richard S. Van Osten Executive Vice President <u>856. 616.8460</u> <u>rick@blsj.com</u>	E-Mail sent to Agency on June 24,2019. No response received.	
<i>Cape Atlantic Conservati on District</i>	<i>David Reilly, District Manager (609) 625-3144 davidreilly@capeatlant ic.org</i>	E-Mail sent to Agency on June 24,2019. No response received.	
<i>City of Atlantic City</i>	Barbara Wooley-Dillon Direct of Planning and Development	E-Mail sent to Agency on June 24,2019. No response received.	

Agency	Contact	Contact Dates (Phone/Email)	Notes
<i>Comcast</i>	Robert Clifton Director of Government and Community Affairs robert.clifton@comcast .net	E-Mail sent to Agency on June 24,2019. No response received.	
<i>FEMA- Region 2</i>	Michael Moriarty Direction, Region II Mitigation (347) 838-0427 michael.moriarty@dhs. gov	E-Mail sent to Agency on June 24,2019. No response received.	
<i>Jacques Cousteau NERR</i>	Michael P. De Luca Reserve Manager 848-932-3474 deluca@marine.rutgers .edu	E-Mail	JCNERR offers the NJFloodmapper.org tool to examine current and future flood hazards and includes GIS layers that show critical facilities, social vulnerability, etc. JCNERR also offers a Coastal Training Program that has training, webinars, and workshops throughout the year to provide continuing education. JCNERR also offers direct technical assistance.
<i>National Oceanic Atmospheric Administration</i>	Darlene Finch, Mid- Atlantic Regional Lead Betsy Nicholson Mid-Atlantic Sub- Region Office for Coastal Management 617-869-9148, betsy.nicholson@noaa. gov	E-mail	NOAA provides data, tools, training, and information that supports coastal management efforts. NOAA also directed the City to visit the NOAA Digital Coast website.

Agency	Contact	Contact Dates (Phone/Email)	Notes
<i>National Weather Service</i>	Dean Iovino Coastal Flooding Program Leader Jason Franklin Meteorologist-in- Charge jason.franklin@noaa.gov v 609-261-6600	E-mail	The National Weather Service issues Coastal Flood Warnings, Watches, and Advisories for Atlantic County. NWS has developed a correlation between water levels at the Atlantic City tide gauges and the magnitude of tidal flooding in Ventnor. NWS has 20 years of data with regard to water levels and flooding reports.
<i>NJ Department of Community Affairs</i>	Nancy B. Diehl Sandy Recovery Division Nancy.diehl@dca.nj.gov (609) 633 2806	E-mail	DCA has provided funding for a variety of projects in Ventnor through the federal CDBG-Disaster Recovery program. Projects included Local Planning Services Grants, Debris Removal, streetscape improvements, and various public services.
<i>NJDEP Climate and Flood Resilience</i>	Dave Rosenblatt Assistant Commissioner/Chief Resilience Officer 609.292.9236 Dave.Rosenblatt@dep.nj.gov	In-Person	Representatives from the Bureau of Flood Resilience met with the Army Corps and Floodplain Management Planning Committee on 12 September 2019. The DEP briefly discussed its coastal resilience plan and issues surrounding the financing of protection projects.
<i>NJDEP-Coastal Management Program</i>	Kimberly Springer Office of Policy and Coastal Management Kim.Springer@dep.nj.gov v 609-292-2178	E-Mail sent to Agency on June 24,2019. No response received.	

Agency	Contact	Contact Dates (Phone/Email)	Notes
<i>NJDEP- Natural and Historical Resources</i>	Raymond Bukowski Assistant Commissioner <i>Ray.Bukowski@dep.nj.gov</i> ov 609-292-3541	E-Mail	The Natural and Historical Resources division manages property in and around the City as a Natural Area and Wildlife Management Area. The properties are maintained in a natural state.
<i>NJDEP- NFIP Coordinator</i>	John H. Moyle, PE State NFIP Coordinator (609) 292-2296 <i>John.Moyle@dep.nj.gov</i>	E-Mail sent to Agency on June 24,2019. No response received.	
<i>NJDOT</i>	Genevieve Clifton Program Manager- Office of Maritime Resources	E-Mail	The Office of Maritime Resources is interested in being a part of discussions should the City wish to pursue reuse of dredge material.
<i>NJOEM</i>	Chris Testa Mitigation Unit Manager 609-508-6557 <i>lpptestc@gw.njsp.org</i>	E-mail	NJOEM directed the City to consult with the State and County Hazard Mitigation Plans.
<i>South Jersey Gas</i>	Lauren Hurtt Supervisor, Public Affairs (609) 561-9000 ext. 4181 <i>lhurtt@sjindustries.com</i>	E-Mail sent to Agency on June 24,2019. No response received.	
<i>Stockton University Coastal Research Center</i>	Dr. Stewart Farrell Director, Stockton University CRC Stewart.farrell@stockton.edu	E-mail	Stockton CRC provided a list of projects that it has assisted the City with completing. This includes beach profiles, project design, the drafting of the City's Watershed Management Plan, nuisance flood studies, and similar projects.

Agency	Contact	Contact Dates (Phone/Email)	Notes
<i>South Jersey Transportation Planning Organization</i>	Jennifer Marandino Executive Director jmarandino@sjtpo.org 856-794-1941	E-mail	SJTPO encouraged Ventnor to contact John Peterson at Atlantic County and copied David Heller, the program manager for resiliency and other environmental efforts at SJTPO.
<i>US Army Corps – Philadelphia District</i>	J. Bailey Smith NJ Back Bay CSRP Project Manager Steve Rochette 215-656-6432 stephen.rochette@usace.army.mil	In-Person	J. Bailey Smith, who manages the Corps' Back Bay Coastal Storm Risk Management Study, met with the DEP and Floodplain Management Planning Committee on 12 September 2019. Smith briefly reviewed the Study project and outlined various conditions and factors determining how the project will advance. The Army Corps requested more information about the City's mitigation efforts. Committee members expressed concern about the efficacy of proposed projects such as floodwalls and tide gates in preventing flooding.
<i>US Fish and Wildlife Service</i>	Steve Mars Senior Fish and Wildlife Biologist Steve.Mars@fws.gov 609-646-9310x5267		The US Fish and Wildlife Service reported that it had no actions that would impact flooding or resiliency in the City.
<i>USDA-Natural Resources Conservation Service</i>	Hilary Trotman Civil Engineer (856) 205-1225, ext. 3 hilary.trotman@nj.usda.gov	E-Mail sent to Agency on June 24, 2019. No response received.	

In addition to these public agencies, information was solicited via letters from residents and property owners. No comments were received.

Step 3. Collect Data.

Each building in the repetitive loss area must be visited to collect data and make a preliminary determination of repetitive flooding and appropriate mitigation measures.

Step 4. Consider Mitigation Alternatives.

This step requires matching the correct mitigation measure with the flooding problem, based on the data collected and the field visits. Many mitigation measures are available, and multiple options should be considered.

The six FEMA mitigation categories follow.

Preventive activities keep things from getting worse. Planning, land acquisition or regulations are put in place to reduce development in flood-prone areas. Examples of non-structural preventative projects include:

- More accurate floodplain mapping using LiDAR and including development of depth grids
- Increased floodplain regulations that manage what can and cannot be done in the SFHA
- More stringent building code requirements to protect buildings
- Creating open space areas within areas subject to flood damage to reduce potential for additional damage
- Changes to the planning and zoning requirements which could include low density zoning requirements in the floodplain
- Maintaining the drainage system to ensure there are no obstructions to the flow
- Implementing stormwater management regulations to reduce post-development runoff from building sites
- Develop setback requirements

Property Protection activities are most often undertaken by property owners on a particular building or can sometimes be led by a community on behalf of a property owner. Examples of non-structural property protection projects include:

- Promotion of flood insurance across the community to make sure those in repetitively flooded buildings in B, C and X-Zones also carry insurance.
- Encourage acquisition and/or relocation of a building to eliminate damage from flooding.

- Elevate pre-FIRM buildings to at or above the base flood elevation plus any freeboard.
- Combined storm and sanitary sewers may require that sewer backup protection measures be implemented.
- Retrofitting a building can eliminate low level repetitive flooding.

Natural Resource Protection activities may not directly affect a building that is subject to repetitive flooding, but these measures can help areas by protecting lands from development and keeping property in a natural state. Examples of non-structural natural resource protection projects include

- Preserving natural areas or restoring areas to a natural state can benefit the quality of a community or local neighborhood.
- Protecting wetlands will allow additional storage of floodwaters and provide a recharge of the aquifer system.
- Protecting the coastline by preserving native habitat and allowing setbacks for construction can protect an area from sea level rise.

Structural projects keep floodwaters away from buildings or an area through a variety of large-scale mitigation projects. These projects are usually undertaken by the local, state, or federal governments or a combination of government entities. These types of projects are often not undertaken by property owners. Examples of structural projects include

- Building a levee or floodwall between a water course and the area to be protected.
- Modifications to channels can bring about reduced flood damage.
- Reservoirs hold water back for a period of time. Floodwaters are stored behind a dam or in a storage or detention basin. Floodwater can be stored for some time, then released slowly so that the stream or river can manage the flow.
- A diversion is a new channel or pipe that moves flood waters away from an existing problem to a new area where there is less of an impact.
- Drainage improvements are often described in a local capital improvement program.

Public Information activities will not fix the flood problem but will help to educate property owners about the causes of repetitive flooding and ways they can protect their buildings from damage. These activities are usually undertaken by the local government but can also be implemented by a regional planning agency, water management district, or other entity. Examples of public information activities include

- Conducting outreach projects including mailings to all properties in the repetitive loss area encouraging the purchase of flood insurance and discussing property protection measures along with sources of financial assistance and where to go to get help.
- Enhancing a community's website to provide property protection advice and assistance and what department will visit a property to investigate a flood problem.
- Working with the real estate community to develop a disclosure program for flooding either by encouraging the use of a local GIS system (which identifies if a building is in

the SFHA or is in an area that is subject to flooding) or by working with the Multiple Listing Service (MLS) to promote disclosure of the flood hazard on MLS forms.

Emergency Services measures are more for response and recovery than for mitigation; however, having a fully operational flood threat recognition system and warning system can protect residents and prepare them to make modifications to their building or to encourage action to move their belongings to a higher level or safer location.

Step 5. Document the findings.

The findings of the analyses must be documented, and a report must be developed for each repetitive loss area. If the types of buildings, flooding problems, and mitigation measures vary from one area of a community to another, a separate report must be prepared for each. However, similar conditions (structure types, flood problems and mitigation) exist in multiple areas, they can be grouped into one report.

Area 1: Ventnor Gardens

Existing Conditions

The Ventnor Gardens repetitive loss area consists of single-family homes, multi-family homes, and apartment buildings. While some modifications have been made, most properties have not been elevated, have a cinderblock foundation, and lack proper flood vents. Properties receive significant risk of flooding due to the wetlands that stem from the West and Inside Thorofare canals.

Mitigation Projects

The Ventnor Gardens Pump Station has been upgraded. The piping network that feeds the pump station is being examined and it is expected that improvements are needed. In addition home elevation needs to continue, specifically those homes closest to the wetlands and canals. In those properties that cannot be elevated, flood vents must be installed to prevent further repetitive loss from flooding. Approximately 6 of the area's 118 repetitive loss properties have been elevated thus far. The replacement of private bulkheads, a responsibility of the property owner, should be encouraged.

Area 2: Oceanfront

Existing Conditions

The Oceanfront repetitive loss area mainly consists of larger single-family homes with the occasional multi-family home or apartment building. The majority of RL properties in this area are directly adjacent or in close proximity to the Atlantic Ocean. Of the total 37 properties, 2 have been elevated with a piles/open foundation. The rest are built on slab and cinderblock foundations, and many do not have obvious flood vents.

Mitigation Projects

A solution to mitigate the risk of flooding in Oceanfront would be to elevate properties, specifically those closest to the beach, boardwalk, and ocean. Flood vents should be installed in properties which are lacking. An additional project would be the installation of engineered dunes on the beachfront to function as a buffer for rising sea levels.

Area 3: Upper Thorofare

Existing Conditions

The Upper Thorofare repetitive loss area consists mainly of single-family and multi-family houses. All the repetitive loss properties in this area are directly adjacent or in close proximity to the Inside Thorofare canal. Despite this connection, only 1 of the area's 24 listed properties has been elevated. In this area, most houses do not have flood vents and are mixed between slab and cinderblock foundations.

Mitigation Projects

A solution to mitigate the risk of flooding in Upper Thorofare would be to elevate properties, specifically those closest to the Inside Thorofare canal. In those properties that cannot be elevated, flood vents must be installed to prevent further repetitive loss from flooding. The replacement of private bulkheads, a responsibility of the property owner, should be encouraged.

Area 4: Northeast Ventnor

Existing Conditions

The Northeast repetitive loss area consists mainly of single-family and multi-family houses. All of the repetitive loss properties in this area are directly adjacent or in close proximity to the Inside Thorofare canal, on the northern end. None of the area's 31 repetitive loss properties have been elevated. Additionally, the vast majority do not have flood vents and are built on cinderblock foundation.

Mitigation Projects

A solution to mitigate the risk of flooding in Northeast would be to elevate properties, specifically those closest to the Inside Thorofare canal. In those properties that cannot be elevated, flood vents must be installed to prevent further repetitive loss from flooding.

Area 5: Ventnor Heights (South)

Existing Conditions

Ventnor Heights (South) – The lower Ventnor Heights area in the City of Ventnor is defined roughly by Calvert Avenue to the south and the surrounding waterways. This area suffers from frequent tidal and rainwater flooding events. The study includes 373 NFIP insured properties and 73 repetitive loss properties.

Ventnor: Repetitive Loss Area Analysis

Rutala Associates, LLC

South repetitive loss area consists mainly of single-family and multi-family houses with occasional commercial property. The majority of repetitive loss properties in this area are directly adjacent or in close proximity to the Inside Thorofare and West canal. In addition, wetlands east of this area further contribute to flooding risk. This area features the largest quantity of repetitive loss properties as well as the largest quantity of elevated properties. Of the 125 total listed properties, 22 have already been elevated. This area also features the most houses with flood vents though the vast majority are still lacking.

Mitigation Projects

It is recommended that the City install two (2) bayside pump stations located at Derby Avenue and Surrey Avenue. Stormwater would discharge through force mains through existing bayside bulkheads. The design of the pump station will consider sea level rise and account for the higher water level as reported in the New Jersey's Rising Seas and Changing Coastal Storms, Rutgers University.

In addition, homeowners should continue to be encouraged to elevate properties, specifically those closest to the Inside Thorofare and West canal. For those properties that cannot be elevated, flood vents must be installed to prevent further repetitive loss from flooding.

Area 6: Ventnor Heights (North)

Existing Conditions

The Ventnor Heights – North repetitive loss area consists mainly of single-family and multi-family houses with occasional commercial property. The majority of repetitive loss properties in this area are directly adjacent or in close proximity to the Inside Thorofare and wetlands in the eastern portion of the site. Of the 52 total listed properties, 1 has been elevated.

Mitigation Projects

A solution to mitigate the risk of flooding in Ventnor Heights - North would be to continue elevating properties, specifically those closest to the Inside Thorofare and wetlands. In those properties that cannot be elevated, flood vents must be installed to prevent further repetitive loss from flooding.

Repetitive Loss Area Summary

The August surveys examined each structure in the repetitive loss area. Despite the geographic diversity of the areas and neighborhoods affected, the same issues and causes of flooding remain overtopping from bulkheads and low-lying topography. The preponderance of non-mitigated, mid-century residential structures provides conditions that can cause future flood damage. Reconstructing bulkheads is an involved permitting process that is

complicated by differing ownership from property to property and the private owner's financial ability to complete such a construction project.

Mitigating flood damage in the repetitive loss areas can be most cost-effectively accomplished through the flood mitigation of private properties through the elevation of existing homes, construction of new ones to higher standards, and through selective land preservation. Larger-scale projects that the City is already undertaking such as drainage improvements and bulkhead replacements provide temporary and incomplete flood mitigation. Through the City's support of private bulkhead replacements and in conjunction with structural mitigation, flood damages can be reduced. Structural solutions proposed by the Army Corps will require additional study to determine impacts to Ventnor property owners.

Current Public Mitigation Projects

In addition to supporting the long-term improvement planned by the US Army Corps of Engineering for both beach and back bay protection, the City of Ventnor has aggressively pursued various short-term projects including:

- Wellington Avenue Bulkhead Replacement – the City has secured full funding for this 500 linear feet of bulkhead replacement from FEMA and the Ocean Wind Pro-NJ Grantor Trust. This project extends from Marion Avenue to Jackson Avenue.
- Lower Ventnor Heights Improvements – the City has secured a FEMA project scoping grant to develop a plan to address flooding in this low-lying area of the City. A FEMA flood mitigation grant application has been submitted for two pump stations as part of Phase 1 of this improvement.
- Ventnor West Living Shoreline – the City has pursued funding to install living shorelines along the end of Ventnor West to abate erosion.
- Shelter Island Restoration – The City has been working with the City of Margate to permit and restore the wetlands at Shelter Island.

Current Private Mitigation Projects

Private property owners (occasionally with the assistance of federal and state funding) have undertaken property mitigation measures that enhance the ability of structures to withstand flooding.

Ventnor's floodplain development ordinance has one of the highest standards for development at the Jersey Shore and requires each new and substantially improved structure to be floodproofed and/or elevated to at least two feet above the base flood

elevation. These standards help ensure that developments in Ventnor will be floodproofed to a high degree of protection for the years to come.

This Repetitive Loss Area Analysis examined the extent to which structural floodproofing has taken place in the City. The results are described in this section. Please note that due to the small size of some repetitive loss areas, these figures are being presented for the totality of the City's repetitive loss areas and are not broken down by neighborhood.

Foundation

Building foundations are a crucial aspect of building safety, particularly for flooding. Foundations that are not designed and built to withstand flooding can face failure when flooding conditions do occur.

Slab homes feature several issues that make them dangerous for flooding. Differential settlement can occur in areas with soft soil, and erosion can scour and undermine concrete foundations. Hydrostatic pressure can crack slab foundations and threaten the structural integrity of the house. Structures that are built on piles and on concrete columns can generally better withstand flooding conditions.

Structure Elevations

Structures that are properly elevated and floodproofed offer some of the best protection against flood damage. By locating habitable living areas and appurtenant equipment out of the flood zone, major flood damage to the building and contents can be mitigated. Structure elevations are often done with reference to a "base flood elevation," or the height to which waters are expected to rise during a base flood or design storm.

The City applies for FEMA funding annually to assist homeowners to elevate their homes. This effort has resulted in the elevation of dozens of homes in Ventnor.

Recommendations, Alternatives, and Updates

Mitigating future flood losses in Ventnor's repetitive loss areas will require a comprehensive suite of improvements that address both individual structures' risk as well as systemic flood protection systems that increase the level of protection for City assets and private property.

The following measures are proposed for Ventnor's Repetitive Loss Areas:

Preventive Activities

- Examine the potential for targeted open space acquisitions in low-lying areas that cannot be feasibly protected through structural flood protection measures.
- Continually examine and revise the floodplain management ordinance to account for sea level changes, new flood maps, and other changes.

- Continue drainage improvements and maintenance.
- Develop a Natural Resources Plan that addresses drainage and green infrastructure.
- Examine ordinance improvements governing stormwater management and impervious surface coverage to reduce the amount of runoff that flows into neighborhoods with poor drainage.

Property Protection Measures

- Elevate remaining buildings and utilities above the base flood elevation;
- Install flood vents in elevated homes on stem-wall foundations
- Close existing bulkhead gaps
- Install sewer backup preventers; and

Natural Resource Protection

- Install and maintain stormwater inlets and debris collectors
- Identify locations where living shorelines can be installed

Emergency Services

- Elevate evacuation routes
- Facilitate city-wide emergency response communications through IPAWS

Structural Projects

- Undertake selective road elevations and drainage improvements and examine the potential for streets to function as flood berms
- Continue to collaborate with the Army Corps and partners on comprehensive flood control improvements that minimize disruption to property and prolong mitigation benefits in the face of future flooding conditions

Public Information

- Map elevation certificates and flood data to monitor plan progress

This Repetitive Loss Area Analysis will be evaluated on an annual basis along with the Floodplain Management Plan, and more thoroughly re-examined and reviewed every three years, or prior to a Community Rating System verification visit. The annual evaluation will consist of an analysis evaluation for progress on recommended actions and to what extent mitigation or building demolition activities have occurred and be publicly available. The re-analysis will occur prior to a CRS cycle visit and entail a thorough re-analysis and survey of conditions in the neighborhood.

References

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Miller, Kenneth G. (2014). "Sea Level Facts Sheet." Rutgers University. Retrieved from http://geology.rutgers.edu/images/stories/faculty/miller_kenneth_g/Sealevelfactsheet7112014update.pdf

National Flood Insurance Program- Community Rating System Coordinator's Manual. Prepared by FEMA, 2013.

Appendix

Appendix 1: Letter to Property Owners

DEPARTMENT OF BUILDING SAFETY
&
FLOOD PLAIN MANAGEMENT



VENTNOR CITY, N.J. 08406

VENTNOR CITY HALL
6201 ATLANTIC AVENUE
ROOM 4
823-7987
823-7966 FAX

July 2, 2021

**Re: FEMA Community Rating System
Repetitive Loss Area Analysis
Ventnor, New Jersey**

Dear Ventnor Property Owner,

You are receiving this letter because your property is in an area that has been flooded several times. The City is undertaking an analysis of flood conditions in your neighborhood. This analysis will allow the City to better understand localized flooding and determine approaches to address it.

This analysis is part of the City's participation in the National Flood Insurance Program's (NFIP) Community Rating System. Participation in the Community Rating System provides NFIP policyholders in the City's flood zones a 25 percent discount on their flood insurance premiums. The Repetitive Loss Area Analysis, which studies areas where properties that have witnessed repetitive flood claims are located, is an activity of the Community Rating System that can increase the City's flood insurance discount.

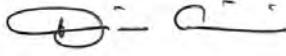
Please note that your property's location in a Repetitive Loss Area does not mean that your property is a repetitive loss property or has experienced flood damage. Please consult your flood insurance policy, provider, or the City to determine whether your property is considered a Repetitive Loss. The Repetitive Loss Area designation is solely an analysis undertaken by the City for planning purposes.

In the next month, City representatives will tour your neighborhood to look at drainage conditions, topography, and structural flood mitigation measures. They will take photographs of your property from the street but *will not* enter your property or request access to your property. In the analysis, discrete property identifiers such as street numbers and/or owner names *will not* be published. This analysis is not being undertaken for tax assessment, code enforcement, or other purposes.

No one knows your neighborhood better than you. If you would like to contribute knowledge or observations about flooding on your property or in your immediate vicinity, please send them via email to jmrutala@comcast.net or contact Dino Cavalieri, the City's Floodplain Manager at 609.823.7987, to ensure that your valuable feedback is incorporated into the analysis. Please note that no mitigation projects have been decided upon; this is an information-gathering effort. The draft analysis will include recommendations and will be available on the City's website in the Fall of 2021 and will later be adopted by the City Commissioners.

For your information, we have attached some steps that you can take to protect yourself and your property from future flooding. Thank you for your cooperation.

Regards,
City of Ventnor



The City of Ventnor is concerned about repetitive flooding and has an active program to help you protect yourself and your property from future flooding, but here are some things you can do:

1. Check with the Building Department on the extent of past flooding in your area. Department staff can tell you about the causes of repetitive flooding, what the City is doing about it, and what would be an appropriate flood protection level. The staff can visit your property to discuss flood protection alternatives.
2. Prepare for flooding by doing the following:
 - Know how to shut off the electricity and gas to your house when a flood comes.
 - Make a list of emergency numbers and identify a safe place to go.
 - Make a household inventory, especially of basement contents.
 - Put insurance policies, valuable papers, medicine, etc., in a safe place.
 - Collect and put cleaning supplies, camera, waterproof boots, etc., in a handy place.
 - Develop a disaster response plan. See the Red Cross's website at www.redcross.org for information about preparing your home and family for a disaster.
 - Get a copy of *Repairing Your Flooded Home*. This can be found on the Red Cross' website, too.
3. Consider some permanent flood protection measures.
 - Mark your fuse or breaker box to show the circuits to the floodable areas. Turning off the power to the basement before a flood can reduce property damage and save lives.
 - Check your building for water entry points, such as basement windows, the basement stairwell, doors, and dryer vents. These can be protected with low walls or temporary shields.
 - Install a floor drain plug, standpipe, overhead sewer, or sewer backup valve to prevent sewer backup flooding.
 - More information can be found at FEMA's website, www.ready.gov/floods.
 - Note that some flood protection measures may need a building permit and others may not be safe for your type of building, so be sure to talk to the Building Department.
4. Talk to the Building Department for information on financial assistance.

If you are interested in elevating your building above the flood level, the City can apply for a Federal grant on your behalf to reimburse 75 percent of the cost. If awarded, the grant will

be used to elevate your home in accordance with the provisions of the grant. *Participation on the part of property owners will be voluntary.*

To start the application process please complete the Notice of Voluntary Interest (attached) and provide proof of National Flood Insurance Program (NFIP) flood insurance and your flood damage history and email them to Rutala Associates, the City's grant consultant, at jmrutala@comcast.net.

Only properties that have are covered by NFIP flood insurance will qualify for this grant.

5. Get a flood insurance policy.

Homeowner's insurance policies do not cover damage from floods. However, because the City participates in the National Flood Insurance Program, you can purchase a separate flood insurance policy. This insurance is backed by the Federal government and is available to everyone, even properties that have been flooded. Because the City participates in the Community Rating System, you receive a reduction in the insurance premium. This discount appears on your flood insurance bill.

Some people have purchased flood insurance because it was required by the bank when they got a mortgage or home improvement loan. Usually these policies just cover the building's structure and not the contents. During the kind of flooding that happens in your area, there is usually more damage to the furniture and contents than there is to the structure. Be sure you have contents coverage.

Don't wait for the next flood to buy insurance protection. In most cases, there is a 30-day waiting period before National Flood Insurance Program coverage takes effect.

Contact your insurance agent for more information on rates and coverage.

Notice of Voluntary Interest - FEMA Flood Mitigation Assistance (FMA) Program

By signing this Notice of Voluntary Interest you are declaring:

1. You are financially able to secure funds to pay for all related costs to elevate the structure.
2. The structural elevation will not start until a grant agreement is fully executed and will be completed in full compliance with FEMA requirements and guidelines.
3. All property owners that are listed on the deed have signed this letter.

Please forward the completed Notice of Voluntary Interest to Jim Rutala, Rutala Associates at jmrutala@comcast.net.

Property Owner Information

Property Owner's Full Name: _____

Co-Owner's Full Name: _____

Phone #: _____ Work #: _____ Cell #: _____

E-Mail: _____

Property Address (property to be elevated)

Street: _____

City: _____ State: _____ Zip: _____

Block: _____ Lot: _____ County: _____

Mailing Address (if different)

Street: _____

City: _____ State: _____ Zip: _____

Co-Owner Mailing Address (if different)

Street: _____

City: _____ State: _____ Zip: _____

Property Information

Body of water causing flooding: _____

Do you currently have Flood Insurance: Y N

Insurance Company: _____ Policy #: _____

Please circle the appropriate answers below:

Is your property in foreclosure: Y N If yes, please indicate the mortgage lender:

Have you filed claims in the last 10 years? Y N ICC? Y N Is home substantially damaged?* Y N

**If the home is substantially damaged, please provide percent damaged and substantially damaged letter from your municipality*

Building Information

Structure Type

- _____ Single Family _____ 2-4 Family
_____ Manufactured _____ Multi-Family Dwelling (5 or more units)
_____ Non-Residential (commercial)

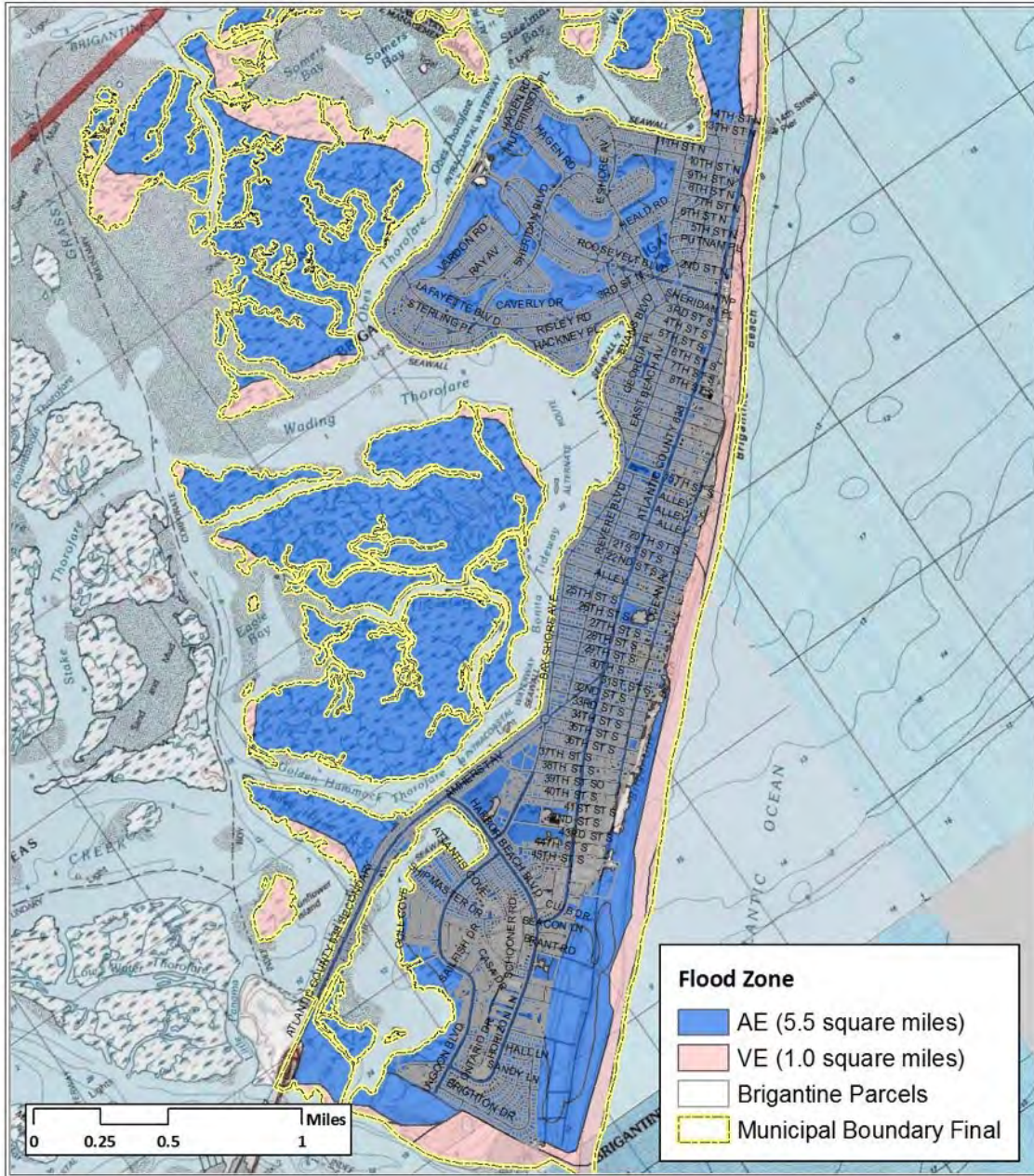
Building Type

- _____ One-Story (without basement) _____ Two-Story (without basement)
_____ One-Story (with basement) _____ Two-Story (with basement)
_____ Manufactured Other (describe): _____

Appendix 2: Copy of Adopted Resolution

TBD

Appendix 3: Map of Ventnor's Flood Zones



Agnoli Engineering, LLC has made every effort to only include GIS data from government sources with published quality control procedures. The flood limits are based on the most recent data available from FEMA, "Preliminary Work Maps," which supersede Advisory Base Flood Elevation maps.

Appendix 4: Map of Repetitive Loss Area



Appendix 5: Survey Results

NOT TO BE INCLUDED FOR PUBLIC REPORT
Documents attached separately.

Appendix 6: Site Visit Photos

NOT TO BE INCLUDED FOR PUBLIC REPORT
Documents attached separately.

Appendix 6: Comments Received from Home Owners

NOT TO BE INCLUDED FOR PUBLIC REPORT
Documents attached separately.

Appendix 7: Floodplain Management Activities

1. **Preventive** activities keep flood problems from getting worse. The use and development of flood-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.
 - Floodplain mapping and data
 - Open space preservation
 - Floodplain regulations
 - Erosion setbacks
 - Planning and zoning
 - Stormwater management
 - Drainage system maintenance
 - Building codes
2. **Property protection** activities are usually undertaken by property owners on a building-by-building or parcel basis.
 - Relocation
 - Acquisition
 - Building elevation
 - Retrofitting
 - Sewer backup protection
 - Insurance
3. **Natural resource protection** activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.
 - Wetlands protection
 - Erosion and sediment control
 - Natural area preservation
 - Natural area restoration
 - Water quality improvement
 - Coastal barrier protection
 - Environmental corridors
 - Natural functions protection
4. **Emergency services** measures are taken during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.
 - Hazard threat recognition
 - Hazard warning
 - Hazard response operations
 - Critical facilities protection
 - Health and safety maintenance
 - Post-disaster mitigation actions
5. **Structural projects** keep flood waters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.
 - Reservoirs
 - Levees/floodwalls
 - Diversions
 - Channel modifications
 - Storm drain improvements
6. **Public information** activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of local floodplains. They are usually implemented by a public information office.
 - Map information
 - Outreach projects
 - Real estate disclosure
 - Library
 - Technical assistance
 - Environmental education

From the CRS Coordinators Manual 2017, Figure 510-4