Flood Risk Report

Camden County Coastal Project Area, New Jersey*

Portions of HUC-8 Watersheds; 02040202 (Lower Delaware), 02040302 (Great Egg Harbor) and 02040301 (Mullica-Toms)

**Spans more than one watershed. This report only covers the studied area within each HUC-8 watershed noted.*

Report Number 001

8/26/2016

Final

FEMA

RiskMAP

Increasing Resilience Together

Project Area Community List

Community Name	Community Name
Borough of Audubon Park	
Borough of Barrington	
Borough of Bellmawr	
Borough of Brooklawn	
Borough of Collingswood	
Borough of Haddon Heights	
Borough of Merchantville	
Borough of Mount Ephraim	
Borough of Oaklyn	
Borough of Runnemede	
Borough of Woodlynne	
City of Camden	
City of Gloucester City	
Township of Cherry Hill	
Township of Gloucester	
Township of Haddon	
Township of Pennsauken	

Preface

The Department of Homeland Security (DHS), Federal Emergency Management Agency's (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) program provides states, tribes, and local communities with flood risk information and tools that they can use to increase their resilience to flooding and better protect their citizens. By pairing accurate floodplain maps with risk assessment tools and planning and outreach support, Risk MAP has transformed traditional flood mapping efforts into an integrated process of identifying, assessing, communicating, planning for, and mitigating flood-related risks.

This Flood Risk Report (FRR) provides non-regulatory information to help local or tribal officials, floodplain managers, planners, emergency managers, and others better understand their flood risk, take steps to mitigate those risks, and communicate those risks to their citizens and local businesses.

Because flood risk often extends beyond community limits, the FRR provides flood risk data for the entire Flood Risk Project as well as for each individual community. This also emphasizes that flood risk reduction activities may impact areas beyond jurisdictional boundaries.

Flood risk is always changing, and there may be other studies, reports, or sources of information available that provide more comprehensive information. The FRR is not intended to be regulatory or the final authoritative source of all flood risk data in the project area. Rather, it should be used in conjunction with other data sources to provide a comprehensive picture of flood risk within the project area.

Table of Contents

Tables

FLOOD RISK REPORT

1 Introduction

1.1 About Flood Risk

Floods are naturally occurring phenomena that can and do happen almost anywhere. In its most basic form, a flood is an accumulation of water over normally dry areas. Floods become hazardous to people and property when they inundate an area where development has occurred, causing losses. Mild flood losses may have little impact on people or property, such as damage to landscaping or the generation of unwanted debris. Severe flooding can destroy buildings, ruin crops, and cause critical injuries or death.

Flooding is a natural part of our world and our communities. Flooding becomes a significant hazard, however, when it intersects with the built environment.

1.1.1 Calculating Flood Risk

It is not enough to simply identify where flooding may occur. Just because one knows where a flood occurs does not mean they know the **risk** of flooding. The most common method for determining flood risk, also referred to as vulnerability, is to identify the probability of flooding and the consequences of flooding. In other words:

- **Flood Risk** (or Vulnerability) **= Probability x Consequences**; where
- **Probability** = the likelihood of occurrence
- **Consequences** = the estimated impacts associated with the occurrence

The probability of a flood is the likelihood that a flood will occur. The probability of flooding can change based on physical, environmental, and/or contributing engineering factors. Factors affecting the probability that a flood will impact an area range from changing weather patterns to the existence of mitigation projects. The ability to assess the probability of a flood and the level of accuracy for that assessment are also influenced by modeling methodology advancements, better knowledge, and longer periods of record for the water body in question.

The consequences of a flood are the estimated impacts associated with the flood occurrence. Consequences relate to humans activities within an area and how a flood impacts the natural and built environments.

Which picture below shows more flood risk?

Even if you assume that the flood in both pictures was the same probability—let's say a 10-percent- annual-chance flood—the consequences in terms of property damage and potential injury as a result of the flood in the bottom picture are much more severe. Therefore, the flood risk in the area shown in the bottom picture is higher.

1.1.2 Risk MAP Flood Risk Products

Through Risk MAP, FEMA provides communities with updated Flood Insurance Rate Maps (FIRMs) and Flood Insurance Studies (FISs) that focus on the probability of floods and that show where flooding may occur as well as the calculated 1% annual chance flood elevation. The

1% annual chance flood, also known as the base flood, has a 1% chance of being equaled or exceeded in any given year. FEMA understands that flood risk is dynamic—that flooding does not stop at a line on a map—and as such, provides the following flood risk products:

- Flood Risk Report (FRR): The FRR presents key risk analysis data for the Flood Risk Project.
- Flood Risk Map (FRM): Like the example found in Section 3.1 of this document, the FRM shows a variety of flood risk information in the project area. More information about the data shown on the FRM may be found in Section 2 of this report.
- Flood Risk Database (FRD): The FRD is in GIS format and houses the flood risk data developed during the course of the flood risk analysis that can be used and updated by the community. After the Flood Risk Project is complete, this data can be used in many ways to visualize and communicate flood risk within the Flood Risk Project.

Whether or not an area might flood is one consideration. The extent to which it might flood adds a necessary dimension to that understanding.

These Flood Risk Products provide flood risk information at both the Flood Risk Project level and community level (for those portions of each community within the Flood Risk Project). They demonstrate how decisions made within a Flood Risk Project can impact properties downstream, upstream, or both. Community-level information is particularly useful for mitigation planning and emergency management activities, which often occur at a jurisdictional level.

1.2 Uses of this Report

The goal of this report is to help inform and enable communities and tribes to take action to reduce flood risk. Possible users of this report include:

- Local elected officials
- Floodplain managers
- Community planners
- Emergency managers
- Public works officials
- Other special interests (e.g., watershed conservation groups, environmental awareness organizations, etc.)

Vulnerability of infrastructure is another important consideration.

State, local, and tribal officials can use the summary information provided in this report, in conjunction with the data in the FRD, to:

- **Update local hazard mitigation plans.** As required by the 2000 Federal Stafford Act, local hazard mitigation plans must be updated at least every five (5) years. Summary information presented in Section 3 of this report and the FRM can be used to identify areas that may need additional focus when updating the risk assessment section of a local hazard mitigation plan. Information found in Section 4 pertains to the different mitigation techniques and programs and can be used to inform decisions related to the mitigation strategy of local plans.
- **Update community comprehensive plans.** Planners can use flood risk information in the development and/or update of comprehensive plans, future land use maps, and zoning regulations. For example, zoning codes may be changed to better provide for appropriate land uses in high-hazard areas.
- **Update emergency operations and response plans.** Emergency managers can identify low-risk areas for potential evacuation and sheltering and can help first responders avoid areas of high-depth flood water. Risk assessment results may reveal vulnerable areas, facilities, and infrastructure for which planning for continuity of operations plans (COOP), continuity of government (COG) plans, and emergency operations plans (EOP) would be essential.
- **Develop hazard mitigation projects.** Local officials (e.g., planners and public works officials) can use flood risk information to re-evaluate and prioritize mitigation actions in local hazard mitigation plans.
- **Communicate flood risk.** Local officials can use the information in this report to communicate with property owners, business owners, and other citizens about flood risks, changes since the last FIRM, and areas of mitigation interest. The report layout allows community information to be extracted in a fact sheet format.
- **Inform the modification of development standards.** Floodplain managers, planners, and public works officials can use information in this report to support the adjustment of development standards for certain locations. For example, heavily developed areas tend to increase floodwater runoff because paved surfaces cannot absorb water, indicating a need to adopt or revise standards that provide for appropriate stormwater retention.

Flooding along the Wabash River in Clark County, Illinois, contributed to a federal disaster declaration on June 24, 2008.

The Flood Risk Database, Flood Risk Map, and Flood Risk Report are "non-regulatory" products. They are available and intended for community use but are neither mandatory nor tied to the regulatory development and insurance requirements of the National Flood

Insurance Program (NFIP). They may be used as regulatory products by communities if authorized by state and local enabling authorities.

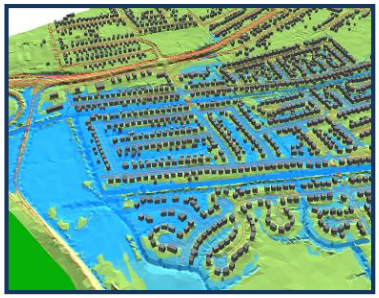
1.3 Sources of Flood Risk Assessment Data Used

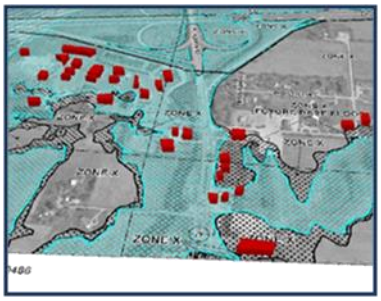
To assess potential community losses, or the consequences portion of the "risk" equation, the following data is typically collected for analysis and inclusion in a Flood Risk Project:

- Information about local assets or resources at risk of flooding
- Information about the physical features and human activities that contribute to that risk
- Information about where the risk is most severe

For most Flood Risk Projects, FEMA uses the following sources of flood risk information to develop this report:

- Hazus estimated flood loss information
- New engineering analyses (e.g., hydrology and hydraulic modeling) to develop new flood boundaries
- Locally supplied data (see Section 7 for a description)
- Sources identified during the Discovery process





FEMA data can be leveraged to identify and measure vulnerability by including local building information (i.e. building type). The examples above show various ways to display flooding intersecting with buildings.

1.4 Related Resources

For a more comprehensive picture of flood risk, FEMA recommends that state and local officials use the information provided in this report in conjunction with other sources of flood risk data, such as those listed below.

- **FIRMs and FISs.** This information indicates areas with specific flood hazards by identifying the limit and extent of the 1-percent-annual-chance floodplain and the 0.2-percent-annual-chance floodplain. FIRMs and FIS Reports do not identify all floodplains in a Flood Risk Project. The FIS Report includes summary information regarding other frequencies of flooding, as well as flood profiles for riverine sources of flooding. In rural areas and areas for which flood hazard data are not available, the 1-percent-annual-chance floodplain may not be identified. In addition, the 1-percent-annual-chance floodplain may not be identified for flooding sources with very small drainage areas (less than 1 square mile).
- **Hazus Flood Loss Estimation Reports.** Hazus can be used to generate reports, maps and tables on potential flood damage that can occur based on new/proposed mitigation projects or future development patterns and practices. Hazus can also run specialized risk assessments, such as what happens when a dam or levee fails. Flood risk assessment tools are available through

other agencies as well, including the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Army Corps of Engineers (USACE). Other existing watershed reports may have a different focus, such as water quality, but may also contain flood risk and risk assessment information. See Section 6 for additional resources.

- **Flood or multi-hazard mitigation plans.** Local hazard mitigation plans include risk assessments that contain flood risk information and mitigation strategies that identify community priorities and actions to reduce flood risk. This report was informed by any existing mitigation plans in the Flood Risk Project.
- **FEMA Map Service Center (MSC).** The MSC has useful information, including fly sheets, phone numbers, data, etc. Letters of Map Change are also available through the MSC. The user can view FIRM databases and the National Flood Hazard Layer (NFHL) Database.

2 Flood Risk Analysis

2.1 Overview

Flood hazard identification uses FIRMs, and FIS Reports identify where flooding can occur along with the probability and depth of that flooding. Flood risk assessment is the systematic approach to identifying how flooding impacts the environment. In hazard mitigation planning, flood risk assessments serve as the basis for mitigation strategies and actions by defining the hazard and enabling informed decision making. Fully assessing flood risk requires the following:

- Identifying the flooding source and determining the flood hazard occurrence probability
- Developing a complete profile of the flood hazard including historical occurrence and previous impacts
- Inventorying assets located in the identified flood hazard area
- Estimating potential future flood losses caused by exposure to the flood hazard area

Flooding impacts non-populated areas too, such as agricultural lands and wildlife habitats.

Flood risk analyses are different methods used in flood risk assessment to help quantify and communicate flood risk. Flood risk analysis can be performed on a large scale (state, community) level and on a very small scale (parcel, census block). Advantages of large-scale flood risk analysis, especially at the watershed level, include identifying how actions and development in one community can affect areas up- and downstream. On the parcel or census block level, flood risk analysis can provide actionable data to individual property owners so they can take appropriate mitigation steps.

2.2 Analysis of Risk

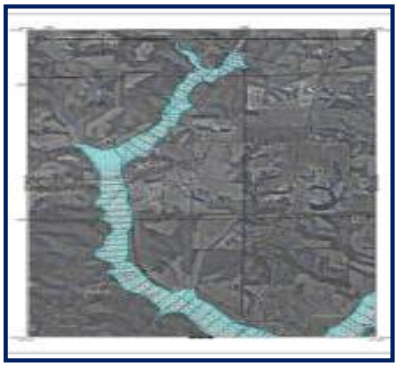
The FRR, FRM, and FRD contain a variety of flood risk analysis information to help describe and visualize flood risk within the project area. Depending on the scope of the Flood Risk Project for this project area, this information may include some or all of the following elements:

- Changes Since Last FIRM
- Water Surface, Flood Depth, and Analysis Grids
- Flood Risk Assessment Information
- Areas of Mitigation Interest

State and Local Hazard Mitigation Plans are required to have a comprehensive all-hazard risk assessment. The flood risk analyses in the FRR, FRM, and FRD can inform the flood hazard portion of a community's or state's risk assessment. Further, data in the FRD can be used to develop information that meets the requirements for risk assessments as it relates to the hazard of flood in hazard mitigation plans.

2.2.1 Changes Since Last FIRM

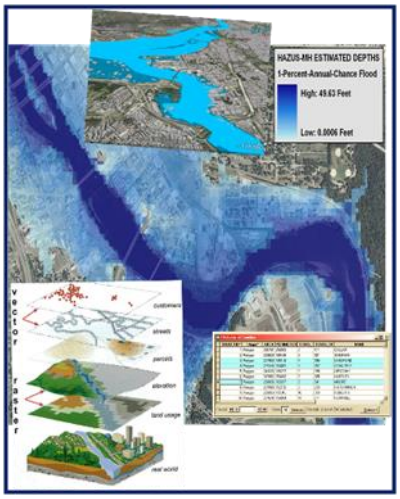
The Changes Since Last FIRM (CSLF) dataset, stored in the FRD and shown in Section 3 of this report, illustrates where changes to flood risk may have occurred since the last FIRM was published for the subject area. Communities can use this information to update their mitigation plans, specifically quantifying "what is at risk" and identifying possible mitigation activities.



The CSLF dataset identifies changes in the Special Flood Hazard Area (SFHA) and floodway boundary changes since the previous FIRM was developed. These datasets quantify land area increases and decreases to the SFHA and floodway, as well as areas where the flood zone designation has changed (e.g., Zone A to AE, AE to VE, shaded Zone X protected by levee to AE for de-accredited levees).

The CSLF dataset is created in areas that were previously mapped using digital FIRMs. The CSLF dataset for this project area includes:

- Floodplain and/or Floodway Boundary Changes: Any changes to the existing floodplain or floodway boundaries are depicted in this dataset
- Floodplain Designation Changes: This includes changed floodplain designations (e.g., Zone A to Zone AE).
- CSLF Information: Within this dataset additional information is provided to help explain the floodplain and floodway boundary changes shown on the FIRM. This information is stored as digital attributes within the CSLF polygons and may include some or all of the following:
    - Changes in peak discharges
    - Changes to the modeling methodology (e.g., tide gage analysis)
    - New flood control structures (e.g., dams, levees, etc.)
    - Changes to hydraulic structures (e.g., bridges, culverts, etc.)
    - Sedimentation and/or Erosion
    - Man-made changes to a watercourse (e.g., realignment or improvement)



Floodplain maps have evolved considerably from the older paper-based FIRMs to the latest digital products and datasets.

It should be noted that reasons for the floodplain and floodway changes (also known as Contributing Engineering Factors) are intended to give the user a general sense of what caused the change, as opposed to providing a reason for each and every area of change.

CSLF data can be used to communicate changes in the physical flood hazard area (size, location) as part of the release of new FIRMS. It can also be used in the development or update of hazard mitigation plans to describe changes in hazard as part of the hazard profile.

CSLF data is shown in the FRR, and underlying data is stored in the FRD.

2.2.2 Flood Depth and Analysis Grids

Grids are FEMA datasets provided in the FRD to better describe the risk of the flood hazard. While the FIRM and FIS Report describe "what" is at risk by identifying the hazard areas, water surface, flood depth, and analysis grids can help define "how bad" the risk is within those identified areas. These grids are intended to be used by communities for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning and emergency management. Grids provided in the FRD for this project area include the following:

- **Flood Depth Grids: (for the calculated flood frequencies included in the FIS Report):** Flood Depth Grids are created for each flood frequency calculated during the course of a Flood Risk Project. These grids communicate flood depth as a function of the difference between the calculated water surface elevation and the ground. Five grids will normally be delivered for riverine areas for the standard flood frequencies (10-, 4-, 2-, 1-, and 0.2-percent-annual-chance). Coastal areas only receive the 1-percent-annual-chance grid.

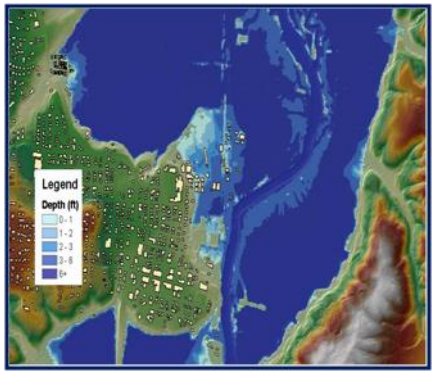
  Depth grids form the basis for refined Hazus loss estimates (as presented in a table in Section 3 of this report) and are used to calculate potential flood losses for display on the FRM and for tabular presentation in this report. Depth grids may also be used for a variety of ad-hoc risk visualization and mitigation initiatives.

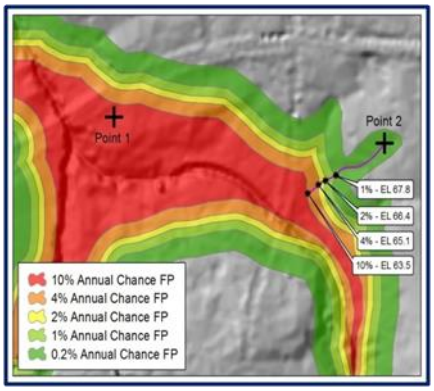
- **Percent Annual Chance of Flooding Grid:** This is a grid dataset that represents the percent annual chance of flooding for locations along a flooding source. This grid uses the five standard flood frequencies.

- **Percent 30-Year Chance of Flooding Grid:** This is a grid dataset that represents the estimated likelihood of flooding at least once within a 30-year period, which is the average lifespan for a home mortgage, for all locations within the extent of the 1-percent-annual-chance and 0.2-percent-annual-chance floodplain.

- ***Water Surface Elevation Change Grid: This dataset provides the ability to see vertical changes in the water surface elevation between the existing FIRM and the revised FIRM. This dataset would be the equivalent of the CSLF dataset, but as a vertical analysis as opposed to a horizontal analysis since last FIRM.***

- ***Water Surface Elevation Grids: This dataset represents the raw results of the hydrologic and hydraulic analysis before adjustments are made to account for influences associated with other flooding sources.***





Grid data can make flood mapping more informative. The top image is a flood depth grid showing relative depths of water in a scenario flood event. The bottom image is a percent annual chance of flooding grid, which shows inundation areas of various frequency floods.

- ***Velocity Grid: This dataset describes the average flood velocity that occurs within the floodplain. Velocity grids can be used to increase public awareness of flood hazards associated with rapidly moving floodwaters.***
- ***Water Surface and/or Depth Grids Based on Additional Flood Frequencies: In addition to the standard flood frequencies referenced above, this dataset is provided when additional flood frequencies are calculated, such as a 20-percent-annual-chance (5-year) or 0.5-percent-annual-chance (200-year) event.***

Grid data can be used to communicate the variability of floodplains, such as where floodplains are particularly deep or hazardous, where residual risks lie behind levees, and where losses may be great after a flood event. For mitigation planning, grid data can inform the hazard profile and vulnerability analysis (what is at risk for different frequencies) and can be used for preliminary benefit-cost analysis screening. For floodplain management, higher regulatory standards can be developed in higher hazard flood prone areas (i.e., 10-percent-chance floodplains or deep floodplains).

Grid data is stored in the FRD, and a list of available grid data is provided in the FRR. Visualizations of grids (maps) are not provided.

2.2.3 Estimated Flood Loss Information

Flood loss estimates provided in the FRR were developed using a FEMA flood loss estimation tool, Hazus. Originally developed for earthquake risk assessment, Hazus has evolved into a multi-hazard tool developed and distributed by FEMA that can provide loss estimates for floods, earthquakes, and hurricane winds. Hazus is a nationally accepted, consistent flood risk assessment tool to assist individuals and communities to create a more accurate picture of flood risk. Some benefits of using Hazus include the following:

- Outputs that can enhance state and local mitigation plans and help screen for cost-effectiveness in FEMA mitigation grant programs
- Analysis refinement through updating inventory data and integrating data produced using other flood models
- Widely available support documents and networks (Hazus Users Groups)

Files from the FRD can be imported into Hazus to develop other risk assessment information including:

- Debris generated after a flood event
- Dollar loss of the agricultural products in a study region
- Utility system damages in the region
- Vehicle loss in the study region
- Damages and functionality of lifelines such as highway and rail bridges, potable water, and wastewater facilities

Scenario-Based Flood Loss Estimates:

Scenario-based flood losses have been calculated using Hazus for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events. In this report, these losses are expressed in dollar amounts and are provided for the Flood Risk Project area only, even though results are shown for the entire watershed and at the local jurisdiction level.

Loss estimates are based on best available data, and the methodologies applied result in an approximation of risk. These estimates should be

used to understand relative risk from flood and potential losses. Uncertainties are inherent in any loss estimation methodology, arising in part from approximations and simplifications that are necessary for a comprehensive analysis (e.g., incomplete inventories, demographics, or economic parameters).

Flood loss estimates are being provided at the project and community levels for multiple flood frequencies including:

- **Residential Asset Loss**: These include direct building losses (estimated costs to repair or replace the damage caused to the building) for all classes of residential structures including single family, multi-family, manufactured housing, group housing, and nursing homes. This value also includes content losses.
- **Commercial Asset Loss**: These include direct building losses for all classes of commercial buildings including retail, wholesale, repair, professional services, banks, hospitals, entertainment, and parking facilities. This value also includes content and inventory losses.
- **Other Asset Loss**: This includes losses for facilities categorized as industrial, agricultural, religious, government, and educational. This value also includes content and inventory losses.
- **Essential Facility Losses:** Essential facilities are defined in Hazus as facilities which provide services to the community and should be functional after a flood, including schools, police stations, fire stations, medical facilities, and emergency operation centers. These facilities would otherwise be considered critical facilities for mitigation planning purposes. Estimated damages (in terms of loss of function) for essential facilities are determined on a site-specific basis according to latitude and longitude. For this report, Hazus calculates the types and numbers of essential facilities impacted.
- **Infrastructure:** For analysis of infrastructure, Hazus supports the analysis of transportation systems and lifeline utility systems. Transportation systems include highways, railways, light railways, busses, ports and harbors, ferries, and airport systems. Utility systems include potable water systems, wastewater, oil, natural gas, electric power, and communication systems. For this report, Hazus calculates the types of infrastructure impacted.
- **Business Disruption**: This includes the losses associated with the inability to operate a business due to the damage sustained during the flood. Losses include inventory, income, rental income, wage, and direct output losses, as well as relocation costs.
- **Annualized Losses**: Annualized losses are calculated using Hazus by taking losses from multiple events over different frequencies and expressing the long-term average by year. This factors in historic patterns of frequent smaller floods with infrequent but larger

Hazus is a loss estimation methodology developed by FEMA for flood, wind, and earthquake hazards. The methodology and data established by Hazus can also be used to study other hazards.

Hazus-estimated loss data can be used in many ways to support local decision making and explanation of flood risk. For mitigation planning purposes, loss data can be used to help meet requirements to develop loss information for the hazard of flood. Also, the FRM can show where flood risk varies by geographic location. For emergency management, Hazus data can help forecast losses based on predicted events, and resources can be assigned accordingly. Loss information can support floodplain management efforts, including those to adopt higher regulatory standards. *Also, awareness of exposed essential facilities and infrastructure encourages mitigation actions to protect citizens from service disruption should flooding occur.*

Hazus estimated loss data is summarized in the FRR and on the FRM and stored in the FRD.

events to provide a balanced presentation of flood damage.

- **Loss Ratio:** The loss ratio expresses the scenario losses divided by the total building value for a local jurisdiction and can be a gage to determine overall community resilience as a result of a scenario event. For example, a loss ratio of 5 percent for a given scenario would indicate that a local jurisdiction would be more resilient and recover more easily from a given event, versus a loss ratio of 75 percent which would indicate widespread losses. An annualized loss ratio uses the annualized loss data as a basis for computing the ratio. Loss ratios are not computed for business disruption. These data are presented in the FRR.
- **Hazus Flood Risk Value:** On the FRM, flood risk is expressed in the following five categories: very low, low, medium, high, and very high for census blocks that have flood risk. It is based on the 1-percent-annual-chance total asset loss by census block.

2.2.4 Areas of Mitigation Interest

Many factors contribute to flooding and flood losses. Some are natural, and some are not. In response to these risks, there has been a focus by the federal government, state agencies, and local jurisdictions to mitigate properties against the impacts of flood hazards so that future losses and impacts can be reduced. An area identified as an Area of Mitigation Interest (AoMI) is an important element of defining a more comprehensive picture of flood risk and mitigation activity in a watershed, identifying target areas and potential projects for flood hazard mitigation, encouraging local collaboration, and communicating how various mitigation activities can successfully reduce flood risk.

This report and the FRM may include information that focuses on identifying Areas of Mitigation Interest that may be contributing (positively or negatively) to flooding and flood losses in the Flood Risk Project. AoMIs are identified through coordination with local stakeholders; through revised hydrologic and hydraulic and/or coastal analyses; by leveraging other studies or previous flood studies; from community mitigation plans, floodplain management plans, and local surveys; and from the mining of federal government databases (e.g., flood claims, disaster grants, and data from other agencies). Below is a list of the types of Areas of Mitigation Interest that may be identified in this Flood Risk Report, shown on the Flood Risk Map, and stored in the Flood Risk Database:

- **Dams**

  A dam is a barrier built across a waterway for impounding water. Dams vary from impoundments that are hundreds of feet tall and contain thousands of acre-feet of water (e.g., Hoover Dam) to small dams that are a few feet high and contain only a few acre-feet of water (e.g., small residential pond). “Dry dams,” which are designed

Dams vary in size and shape, the amount of water they impound, and their assigned hazard classification.

to contain water only during floods and do not impound water except for the purposes of flood control, include otherwise dry land behind the dam.

While most modern, large dams are highly engineered structures with components such as impervious cores and emergency spillways, most smaller and older dams are not. State dam safety programs emerged in the 1960s, and the first Federal Guidelines for Dam Safety were not prepared until 1979. By this time, the vast majority of dams in the United States had already been constructed.

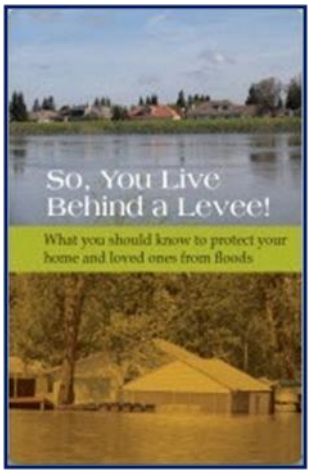
- **Reasons dams are considered AoMIs:**
  - Many older dams were not built to any particular standard and thus may not withstand extreme rainfall events. Older dams in some parts of the country are made out of an assortment of materials. These structures may not have any capacity to release water and could be overtopped, which could result in catastrophic failure.
  - Dams may not always be regulated, given that the downstream risk may have changed since the dam was constructed or since the hazard classification was determined. Years after a dam is built, a house, subdivision, or other development may be constructed in the dam failure inundation zone downstream of the dam. Thus, a subsequent dam failure could result in downstream consequences, including property damage and the potential loss of life. Since these dams are not regulated, it is impossible to predict how safe they are.
  - A significant dam failure risk is structural deficiencies associated with older dams that are not being adequately addressed today through needed inspection/maintenance practices.
  - For larger dams a flood easement may have been obtained on a property upstream or downstream of the dam. However, there may have been buildings constructed in violation of the flood easement.
  - When a new dam is constructed, the placement of such a large volume of material in a floodplain area (if that is the dam location) will displace flood waters and can alter how the watercourse flows. This can result in flooding upstream, downstream, or both.
  - For many dams, the dam failure inundation zone is not known. Not having knowledge of these risk areas could lead to unprotected development in these zones.

This dam failure caused flooding that damaged several homes and vehicles.

- **Levees and Major Embankments**

  FEMA defines a levee as "a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding." Levees are sometimes referred to as dikes. Soil used to construct a levee is compacted to make the levee as strong and stable as possible. To protect against erosion and scouring, levees can be covered with everything from grass and gravel to harder surfaces like stone (riprap), asphalt, or concrete.

  Similar to dams, levees have not been regulated in terms of safety and design standards until relatively recently. Many older levees were constructed in a variety of ways, from a farmer piling dirt along a stream to prevent nuisance flooding to levees made out of old mining spoil material. As engineered structures, levees are designed to a certain height and can fail if a flood event is greater than anticipated.

  For more information about the risks associated with living behind levees, consult the publication "So, You Live Behind a Levee!" published by the American Society of Civil Engineers at http://content.asce.org/ASCELeveeGuide.html

  A floodwall is a vertical wall that is built to provide protection from a flood in a similar manner as a levee. Typically made of concrete or steel, floodwalls often are erected in urban locations where there is not enough room for a levee. Floodwalls are sometimes constructed on a levee crown to increase the levee's height.

  Most new dams and levees are engineered to a certain design standard. If that design is exceeded, they could be overtopped and fail catastrophically, causing more damage than if the levee was not there in the first place. Few levees anywhere in the nation are built to more than a 1-percent-annual-chance flood protection rating, and the areas behind them are still at some risk for flooding. This threat is called residual risk. In some states, residual risk areas can extend up to 15 miles from a riverbank. Although the probability of flooding may be lower because a levee exists, risk is nonetheless still present. The American Society of Civil Engineers' publication "So, You Live Behind a Levee!" provides an in-depth explanation of levee and residual risk.

  Major embankments, on the other hand, are rarely designed with any flood protection level in mind. Railroads, road abutments, and canals—especially in the Western United States—are not considered levees or dams and have issues such as unknown construction materials/methods. These embankments are not regulated from a flood risk standpoint.

  - **Reasons levees and major embankments are considered AoMIs:**

    - Like dams, many levees in the United States were constructed using unknown techniques and materials.

These levees have a higher failure rate than those that have been designed to today's standards.

- A levee might not provide the flood risk reduction it once did as a result of flood risk changes over time. Flood risk can change due to a number of factors, including increased flood levels due to climate change or better estimates of flooding, development in the watershed increasing flood levels and settlement of the levee or floodwall, and sedimentation in the levee channel. Increased flood levels mean decreased flood protection. The lack of adequate maintenance over time will also reduce the capability of a levee to contain the flood levels for which it was originally designed.
- Given enough time, any levee will eventually be overtopped or damaged by a flood that exceeds the levee's capacity. Still, a widespread public perception of levees is that they will always provide protection. This perception may lead to not taking mitigation actions such as purchasing flood insurance.
- A levee is a system that can fail due to its weakest point, and therefore maintenance is critical. Many levees in the United States are poorly maintained or not maintained at all. Maintenance also includes maintaining the drainage systems behind the levees so they can keep the protected area dry.

Canal levee breaches as a result of Hurricane Katrina in New Orleans in 2005. Note damages can be more extensive due to high velocity flood flows than if the levee was not there.

- **Coastal Structures**

  Coastal structures are used to "harden" the shoreline for a variety of purposes and include:

  - **Jetties:** Structures constructed to direct currents or accommodate vessels.
  - **Groynes:** Protective structures of stone or concrete that extend from shore into the water to prevent a beach from washing away.
  - **Sea walls:** A form of hard and strong coastal defense constructed on the inland part of a coast to reduce the effects of strong waves.

  As the rate of sea level rise accelerates, an increase in coastal erosion is likely. We are now facing rapid sea level changes on a scale of decades. Higher sea levels could affect the coastal zone and accelerate coastal erosion and flooding in a variety of ways, including greater shoreline retreat; increased coastal erosion rates; property destruction; and saltwater intrusion into bays, rivers, and

Severe beach erosion and damage resulting from a nor'easter.

underground water resources. In addition, a general elevation in the water table due to sea level rise will result.

- **Reasons coastal structures are considered AoMIs:**
  - While coastal structure may provide flood or erosion protection for one site, it might also interrupt the sediment transport process, resulting in accelerated coastal erosion downdrift of the structure.
  - Coastal structures are typically designed to withstand the forces associated with extreme design conditions of waves and water levels. Adequate protection may not be provided if these conditions are exceeded.
  - As with other infrastucture such as roads, bridges, and utilities, regular maintenance of shoreline protection structures is essential to ensure that they continue to provide the intended protection from flooding and erosion.

- **Stream Flow Constrictions**

  A stream flow constriction occurs when a human-made structure, such as a culvert or bridge, constricts the flow of a river or stream. The results of this constriction can be increased damage potential to the structure, an increase in velocity of flow through the structure, and the creation of significant ponding or backwater upstream of the structure. Regulatory standards regarding the proper opening size for a structure spanning a river or stream are not consistent and may be non-existent. Some local regulations require structures to pass a volume of water that corresponds to a certain size rain event; however, under sizing, these openings can result in flood damage to the structure itself. After a large flood event, it is not uncommon to have numerous bridges and culverts “washed out.”

  - **Reasons stream flow constrictions are considered AoMIs:**
    - Stream flow constrictions can back water up on property upstream of the structure if not designed properly.
    - These structures can accelerate the flow through the structure causing downstream erosion if not properly mitigated. This erosion can affect the structure itself, causing undermining and failure.
    - If the constriction is a bridge or culvert, it can get washed out causing an area to become isolated and potentially more difficult to evacuate.
    - Washed-out culverts and associated debris can wash downstream and cause additional constrictions.

- **At-Risk Essential Facilities**

  Essential facilities, sometimes called "critical facilities," are those whose impairment during a flood could cause significant problems to individuals or communities. For example, when a community's wastewater treatment is flooded and shut down, not only do contaminants escape and flow into the floodwaters, but backflows of sewage can contaminate basements or other areas of the community. Similarly, when a facility such as a hospital is flooded, it can result in a significant hardship on the community not only during the event but long afterwards as well.

  - **Reasons at-risk essential facilities are considered AoMIs:**
    - Costly and specialized equipment may be damaged and need to be replaced.
    - Impairments to facilities such as fire stations may result in lengthy delays in responding and a focus on evacuating the facility itself.
    - Critical records and information stored at these facilities may be lost.

- **Past Flood Insurance Claims and Individual Assistance/Public Assistance Hotspots**

  Assistance provided after flood events (flood insurance in any event and Individual Assistance [IA] or Public Assistance [PA] after declared disasters) occurs in flood affected areas. Understanding geographically where this assistance is being provided may indicate unique flood problems.

  Flood insurance claims are not always equally distributed in a community. Although estimates indicate that 20 to 50 percent of structures in identified flood hazard areas have flood insurance, clusters of past claims may indicate where there is a flood problem. However, clusters of past claims and/or areas where there are high payments under FEMA's IA or PA Programs may indicate areas of significant flood hazard.

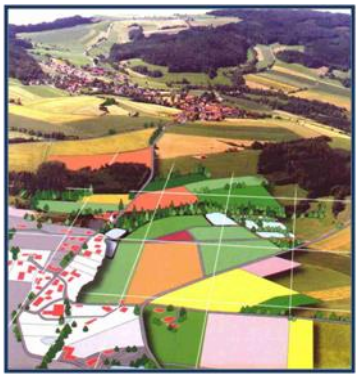
  - **Reasons past claim hotspots are considered AoMIs:**
    - A past claim hotspot may reflect an area of recent construction (large numbers of flood insurance policies as a result of a large number of mortgages) and an area where the as-built construction is not in accordance with local floodplain management regulations.
    - Sometimes clusters of past claims occur in subdivisions that were constructed before flood protection standards were in place, places with inadequate

Clusters of past flood insurance claims can show where there is a repetitive flood problem.

stormwater management systems, or in areas that may not have been identified as SFHAs.

- Clusters of IA or PA claims may indicate areas where high flood insurance coverage or other mitigation actions are needed.

- **Areas of Significant Land Use Change**



Rooftops, pavements, patios, and driveways contribute to the impervious area in a watershed. This occurs in both urban areas and rural areas being developed.

Development, whether it is a 100-lot subdivision or a single lot big box commercial outlet, can result in large amounts of fill and other material being deposited in flood storage areas, thereby increasing flood hazards downstream.

Additionally, when development occurs, hard surfaces such as parking lots, buildings and driveways do not allow water to absorb into the ground, and more of the rainwater becomes runoff flowing directly into streams. As a result, the "peak flow" in a stream after a storm event will be higher and will occur faster. Without careful planning, major land use changes can affect the impervious area of a site and result in a significant increase in flood risk caused by streams that cannot handle the extra storm water runoff.

Changes in land use in areas vulnerable to coastal flooding may affect the severity of wave hazards. Wave energy dissipates as waves propagate through forested areas or areas with dense development while wave energy can increase in open areas such as agricultural fields or parking lots. Changes in land use can affect wave hazards beyond the immediate area of land use change.

Sometimes a major land use change may be for planning purposes only. For example, a land use change that rezones land from a classification such as floodplain that restricts development to a zone such as industrial or high density residential could result in significant new infrastructure and structures in high flood risk areas.

- **Reasons Areas of Significant Land Use Change are considered AoMIs:**

  - Development in areas mapped SFHA reduces flood storage areas, which can make flooding worse at the development site and downstream of it.

  - Impervious surfaces speed up the water flowing in the streams, which can increase erosion and the danger that fast-flowing floodwaters pose to people and buildings.

  - Open areas can allow wave energy to increase while densely developed areas and dense vegetation cover

often obstruct waves. These obstructions diminish the wave's potentially destructive forces in areas inland of the obstructions.

- Rezoning flood-prone areas to high densities and/or higher intensity uses can result in more people and property at risk of flooding and flood damage.

- **Key Emergency Routes Overtopped During Frequent Flooding Events**

  Roads are not always elevated above estimated flood levels, and present a significant flood risk to motorists during flooding events. When alternate routes are available, risks may be reduced, including risks to life and economic loss.

  - **Reasons overtopped roads are considered AoMIs:**
    - Such areas, when identified, can be accounted for and incorporated into Emergency Action Plans.
    - Roads may be elevated or reinforced to reduce the risk of overtopping during flood events.

When large highways close due to flooding, traffic is detoured causing inconvenience and economic loss.

- **Drainage or Stormwater-Based Flood Hazard Areas, or Areas Not Identified as Floodprone on the FIRM But Known to Be Inundated**

  Flood hazard areas exist everywhere. While FEMA maps many of these, others are not identified. Many of these areas may be located in communities with existing, older, and often inadequate stormwater management systems or in very rural areas. Other similar areas could be a result of complex or unique drainage characteristics. Even though they are not mapped, awareness of these areas is important so adequate planning and mitigation actions can be performed.

  - **Reasons drainage or stormwater-based flood hazard areas or unidentified floodprone locations are considered AoMIs:**
    - So further investigation of such areas can occur and, based on scientific data, appropriate mitigation actions can result (i.e., land use and building standards).
    - To create viable mitigation project applications in order to reduce flood losses.

- **Areas of Mitigation Success**

  Flood mitigation projects are powerful tools to communicate the concepts of mitigation and result in more resilient communities. Multiple agencies have undertaken flood hazard mitigation actions for decades. Both structural measures—those that result in flood control structures—and non-structural measures have been

implemented in thousands of communities. An extensive list of mitigation actions can be found in Section 4.

- **Reasons areas of mitigation success are considered AoMIs:**
  - Mitigation successes identify those areas within the community that have experienced a reduction or elimination of flood risk.
  - Such areas are essential in demonstrating successful loss reduction measures and in educating citizens and officials on available flood hazard mitigation techniques.
  - Avoided losses can be calculated and shown.

- **Areas of Significant Riverine or Coastal Erosion**

  Stream channels are shaped by a number of factors, including: degradation, aggradation, general scour, local scour, deposition, and lateral migration. Streams are constantly progressing towards a state of dynamic equilibrium involving water and sediment.

  - **Reasons why areas of significant riverine or coastal erosion are considered AoMIs:**
    - Riverine flood damage assessments generally consider inundation alone
    - Bank erosion caused by within channel flows is not recognized as a significant hazard in Federal floodplain management regulations
    - Riverine and coastal erosion can undercut structures and roads, causing instability and possible collapse.
    - Landslides and mudslides are a result of erosion
    - Approximately one-third of the nation's streams experience severe erosion problems

- **Other**

  Other types of flood risk areas include drainage or stormwater-based flood hazard areas, or areas known to be inundated during storm events.

3 Flood Risk Analysis Results

The following pages provide summary flood risk results for the Flood Risk Project as follows:

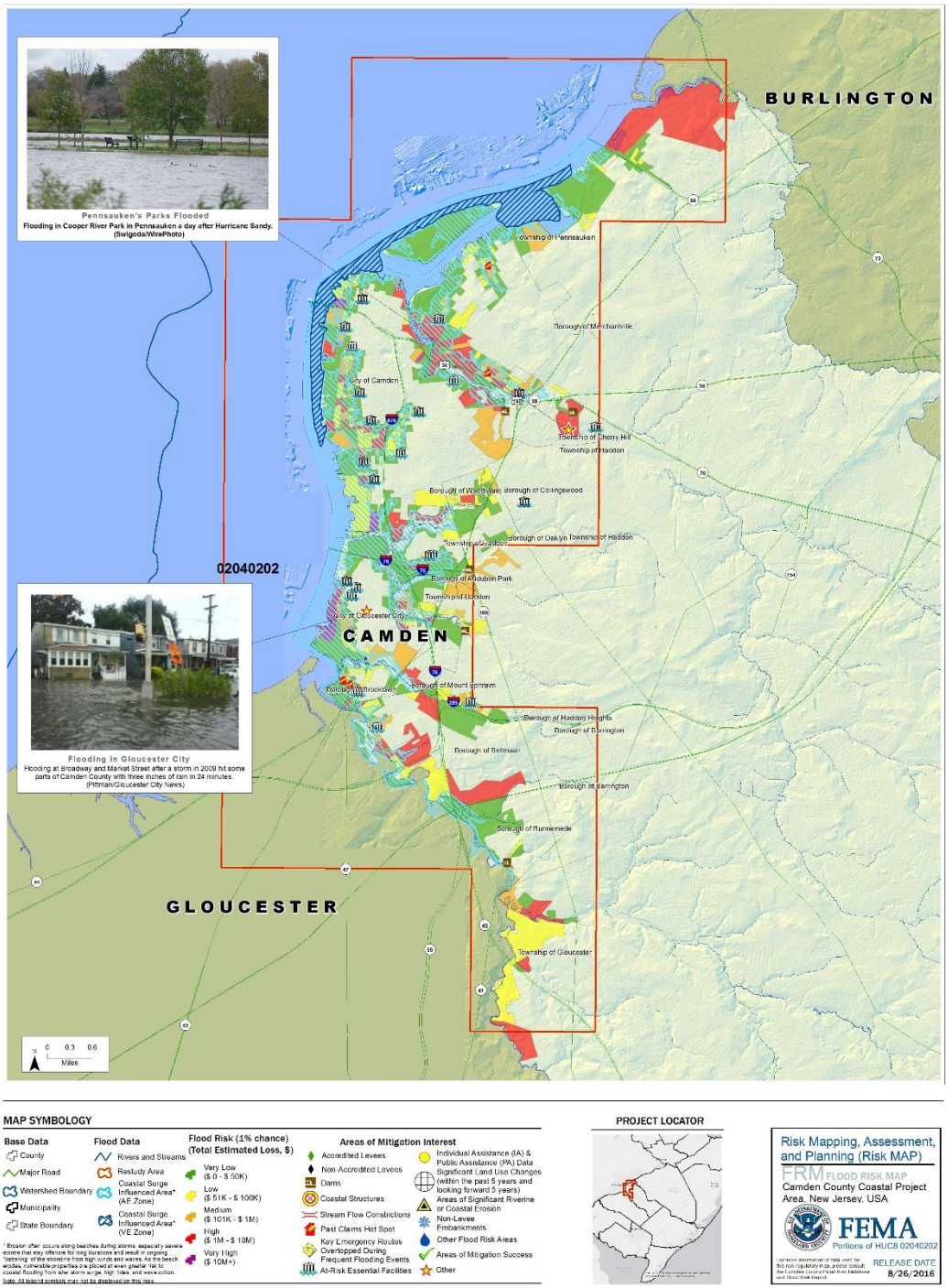
- **Flood Risk Map (FRM).** Within the Flood Risk Project the FRM displays base data reflecting community boundaries, major roads, and stream lines; potential losses that include both the 2010 Average Annualized Loss (AAL) flood loss study supplemented with new Hazus runs for areas with new or updated flood modeling; new Flood Risk Project areas; a bar chart summarizing community per capita loss; and graphics and text that promote access and usage of additional data available through the FRD, FIRM, and National Flood Hazard Layer and viewers (desktop or FEMA website, etc.). This information can be used to assist in Flood Risk Project-level planning as well as for developing mitigation actions within each jurisdiction located within the Flood Risk Project.
- **Flood Risk Project Summary.** Within the Flood Risk Project area, summary data for some or all of the following datasets are provided for the entire project area and also on a jurisdiction by jurisdiction basis:
  - **Changes Since Last FIRM (CSLF).** This is a summary of where the floodplain and flood zones have increased or decreased (only analyzed for areas that were previously mapped using digital FIRMs).
  - **Flood Depth and Analysis Grids.** A general discussion of the data provided in the FRD, including coastal and dam analysis grids if furnished as part of the project.
  - **Flood Risk Assessment Information.** A loss estimation of potential flood damages using different flood scenarios.
  - **Areas of Mitigation Interest.** A description of areas that may require mitigation or additional risk analysis.

The FRM provides a graphical overview of the Flood Risk Project which highlights areas of risk that should be noted, based on potential losses, exposed facilities, etc., based on data found in the FRD. Refer to the data in the FRD to conduct additional analyses.

3.1 Flood Risk Map

The Flood Risk Map for this Flood Risk Project is shown below. The flood risk data displayed is based on 2010 Average Annualized Losses for coastal analysis. In addition to this reduced version of the map, a full size version is available within the FRD.

Flood Risk Map: Camden County Coastal Project Area, New Jersey



This page left intentionally blank.

3.2 Camden County Coastal Project Area, New Jersey Flood Risk Project Area Summary

Camden County is located in North Eastern New Jersey and is comprised of 14 communities with an estimated population of 102,326 (2000 US Census) in the project area.

3.2.1 Overview

Camden County Coastal Project Area, located in New Jersey, includes the following communities:

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan*
Borough of Audubon Park	340122	1,102	0	0.2	1	N	10	Y
Borough of Barrington	340579	7,084	2	1.6	4	Y	10	Y
Borough of Bellmawr	340124	11,262	99	3.1	100	Y	10	Y
Borough of Brooklawn	340127	2,354	100	0.5	100	Y	10	Y
Borough of Collingswood	340131	14,326	91	1.9	92	Y	10	Y
Borough of Haddon Heights	340136	7,547	14	1.6	16	Y	10	Y
Borough of Merchantville	340569	3,801	9	0.6	6	Y	10	Y
Borough of Mount Ephraim	340140	4,495	39	0.9	45	Y	10	Y
Borough of Oaklyn	340141	4,188	10	0.7	19	Y	10	Y
Borough of Runnemede	340144	8,533	79	2.1	83	Y	10	Y
Borough of Woodlynne	340149	2,796	100	0.2	100	Y	10	Y
City of Camden	340128	79,904	100	10.5	100	Y	10	Y
City of Gloucester City	340132	11,484	100	2.8	100	Y	10	Y
Township of Cherry Hill	340129	69,965	0	24.2	0	Y	10	Y
Township of Gloucester	340133	64,350	14	23.3	11	Y	10	Y
Township of Haddon	340134	14,651	11	2.8	17	Y	10	Y
Township of Pennsauken	340142	35,737	53	12.2	63	Y	10	Y

Community-specific results are provided on subsequent pages. Data provided below and on subsequent pages only includes areas located within the Camden County Coastal Project Area Flood Risk Project and do not necessarily represent community-wide totals.

Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.2.2 Flood Risk Datasets

As a part of this Flood Risk Project, flood risk datasets were created for inclusion in the Flood Risk Database. Those datasets are summarized for this Flood Risk Project below:

- **Changes Since Last FIRM**
  - Special Flood Hazard Area (SFHA) boundaries within Camden County Coastal Project Area were updated due to new engineering analysis performed within the Flood Risk Project. The updated modeling produced new flood zone areas and new base flood elevations in some areas and leveraged recently developed LiDAR-based topographic data for the Flood Risk Project. The data in this section reflects a comparison between the effective FIRM(s) and the new analysis in this study in the form of Preliminary Coastal Floodplains.

The table below summarizes the increases, decreases, and net change of SFHAs for the project.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	9.1	0.5	-1.3	-0.8
Within Floodway	0.5	0.1	0.0	0.1
Within Non-SFHA	4.5	0.3	-1.8	-1.5
Within CHHA	1.0	1.0	0.0	1.0

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Camden County Coastal Project Area, the figures in this table only represent information within the Camden County Coastal Project Area.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - The FRD contains a dataset in the form of a depth grid for the Flood Risk Project that can be used for additional analysis, enhanced visualization, and communication of flood risks for hazard mitigation planning and emergency management. The data provided within the FRD should be used to further isolate areas where flood mitigation potential is high and may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation. Section 2 of the FRR provides general information regarding the development of and potential uses for this data.

  - The new depth grid provided in the FRD includes depth values based from Stillwater elevations in which new wave height analysis was included based on storm surge results and is the basis for Flood Insurance Study - Work Map coastal flood zones. The depth grid data corresponds to the full extent of the Work Map data.

  - Elevation hillshade raster is provided as a standard GIS raster which is used as a mapping backdrop to promote understanding of topographic relief. The hillshade raster covers the full extent of the topographic raster used in the production of Flood Insurance Study products.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
    - The Camden County Coastal Project Area incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the watershed. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.

    - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.

    - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

Table 3.1. Summary of Potential Flood Losses (2010 AAL)

	Camden County Coastal Project - Estimated Potential Losses for Flood Event Scenarios											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$10,096,500,000	52%	$85,400,000	<1%	$1,127,830,000	11%	$1,376,380,000	14%	$1,952,500,000	19%	$36,410,000	<1%
Commercial Building and Contents Losses	$5,314,600,000	27%	$119,600,000	2%	$900,220,000	17%	$1,139,820,000	21%	$1,400,200,000	26%	$33,460,000	<1%
Other Building and Contents Losses	$4,056,900,000	21%	$157,040,000	4%	$784,660,000	19%	$881,560,000	22%	$1,094,890,000	27%	$33,700,000	<1%
Total Building and Contents Losses[3]	$19,468,000,000	100%	$362,040,000	2%	$2,812,710,000	14%	$3,397,760,000	17%	$4,447,590,000	23%	$103,570,000	<1%
Business Disruption[4]	N/A	N/A	$26,640,000	N/A	$126,510,000	N/A	$136,710,000	N/A	$165,910,000	N/A	$4,930,000	N/A
TOTAL[5]	$19,468,000,000	100%	$388,680,000	2%	$2,939,220,000	15%	$3,534,470,000	18%	$4,613,500,000	24%	$108,500,000	<1%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are summed from all respective Community loss tables; final summations are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

Table 3.2. Summary of Potential Flood Losses (Refined 1%)

	Camden County Coastal Project - Estimated Potential Losses for Flood Event Scenarios											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$10,096,500,000	52%	N/A	N/A	N/A	N/A	$109,710,000	1%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$5,314,600,000	27%	N/A	N/A	N/A	N/A	$119,810,000	2%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$4,056,900,000	21%	N/A	N/A	N/A	N/A	$226,390,000	6%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$19,468,000,000	100%	N/A	N/A	N/A	N/A	$455,910,000	2%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	$2,910,000	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$19,468,000,000	100%	N/A	N/A	N/A	N/A	$458,820,000	2%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are summed from all respective Community loss tables; final summations are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest – Totals by Camden County Coastal Project Area**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type for the Camden County Coastal Project Area:

Type of Mitigation Interest	Number of Areas*	Data Source
Dam	5	State
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	4	FEMA
At Risk Essential Facilities	22	FEMA
Other Flood Risk Areas	2	Community

  - Based on current FRD specifications, Areas of Mitigation Interest (AoMI) can include Dams, Non-Accredited Levees, Accredited Levees, Coastal Structures, Streamflow Constrictions, Key Emergency Routes Overtopped, Past Claims Hot Spot, Individual Assistance (IA) or Public Assistance (PA), Significant Land Use Change, Areas of Significant Erosion, Non-Levee Embankments, At Risk Essential Facilities, Other Flood Risk Areas, Areas of Mitigation Success, and Other. The AoMI table presented in this report only shows the types of AoMI's identified in the project area.
  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster.

3.3 Communities

The following sections provide an overview of the community's floodplain management program as of the date of this publication.

3.3.1 Borough of Audubon Park (CID 340122)

The information below provides an overview of the Borough of Audubon Park as of the date of this publication.

3.3.1.1 Overview

The Borough of Audubon Park is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Borough of Audubon Park	340122	1,102	0	0.2	1	N	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 0 policies
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within the Borough of Audubon Park that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.1.2 Community Analyses and Results

- **Changes Since Last FIRM**
  - Special Flood Hazard Area (SFHA) boundaries within the Borough of Audubon Park were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.
  -

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.0	0.0	0.0	0.0
Within Floodway	N/A	N/A	N/A	N/A
Within Non-SFHA	0.0	0.0	0.0	0.0
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Borough of Audubon Park, the figures in this table only represent information within the Borough of Audubon Park.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The Borough of Audubon Park flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	Borough of Audubon Park - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$800,000	40%	N/A	N/A	N/A	N/A	N/A	N/A	$300,000	38%	N/A	N/A
Other Building and Contents Losses	$1,200,000	60%	N/A	N/A	N/A	N/A	N/A	N/A	$500,000	42%	N/A	N/A
Total Building and Contents Losses[3]	$2,000,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	$800,000	40%	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$40,000	N/A	N/A	N/A
TOTAL[5]	$2,000,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	$840,000	42%	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Borough of Audubon Park - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$800,000	40%	N/A	N/A	N/A	N/A	$10,000	1%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$1,200,000	60%	N/A	N/A	N/A	N/A	$30,000	3%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$2,000,000	100%	N/A	N/A	N/A	N/A	$40,000	2%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$2,000,000	100%	N/A	N/A	N/A	N/A	$40,000	2%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest - Borough of Audubon Park**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	0	N/A

  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.2 Borough of Barrington (CID 340579)

The information below provides an overview of the Borough of Barrington as of the date of this publication.

3.3.2.1 Overview

The Borough of Barrington is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Borough of Barrington	340579	7,084	2	1.6	4	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 12 policies totaling approximately $ 2,766,000
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within the Borough of Barrington that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.2.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within the Borough of Barrington were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.0	0.0	0.0	0.0
Within Floodway	N/A	N/A	N/A	N/A
Within Non-SFHA	N/A	N/A	N/A	N/A
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Borough of Barrington, the figures in this table only represent information within the Borough of Barrington.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The Borough of Barrington flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	Borough of Barrington - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$2,100,000	68%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$1,000,000	32%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$3,100,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$3,100,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Borough of Barrington - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$2,100,000	68%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$1,000,000	32%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$3,100,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$3,100,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest - Borough of Barrington**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	0	N/A

  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

- *This page left intentionally blank.*

3.3.3 Borough of Bellmawr (CID 340124)

The information below provides an overview of the Borough of Bellmawr as of the date of this publication.

3.3.3.1 Overview

The Borough of Bellmawr is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Borough of Bellmawr	340124	11,262	99	3.1	100	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 63 policies totaling approximately $ 16,170,800
- NFIP-recognized repetitive loss properties = 1
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within the Borough of Bellmawr that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.3.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within the Borough of Bellmawr were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.5	0.0	0.0	0.0
Within Floodway	0.0	0.0	0.0	0.0
Within Non-SFHA	0.1	0.0	-0.1	-0.1
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Borough of Bellmawr, the figures in this table only represent information within the Borough of Bellmawr.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The Borough of Bellmawr flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	Borough of Bellmawr - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$842,300,000	61%	$300,000	<1%	$10,800,000	1%	$14,000,000	2%	$31,000,000	4%	$400,000	<1%
Commercial Building and Contents Losses	$350,700,000	25%	$2,500,000	<1%	$8,900,000	3%	$10,200,000	3%	$13,100,000	4%	$500,000	<1%
Other Building and Contents Losses	$197,400,000	14%	$1,900,000	<1%	$4,400,000	2%	$4,800,000	2%	$6,100,000	3%	$300,000	<1%
Total Building and Contents Losses[3]	$1,390,400,000	100%	$4,700,000	<1%	$24,100,000	2%	$29,000,000	2%	$50,200,000	4%	$1,200,000	<1%
Business Disruption[4]	N/A	N/A	$400,000	N/A	$1,100,000	N/A	$1,200,000	N/A	$1,500,000	N/A	$60,000	N/A
TOTAL[5]	$1,390,400,000	100%	$5,100,000	<1%	$25,200,000	2%	$30,200,000	2%	$51,700,000	4%	$1,260,000	<1%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Borough of Bellmawr - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$842,300,000	61%	N/A	N/A	N/A	N/A	$2,500,000	<1%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$350,700,000	25%	N/A	N/A	N/A	N/A	$4,700,000	1%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$197,400,000	14%	N/A	N/A	N/A	N/A	$3,700,000	2%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$1,390,400,000	100%	N/A	N/A	N/A	N/A	$10,900,000	<1%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	$100,000	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$1,390,400,000	100%	N/A	N/A	N/A	N/A	$11,000,000	<1%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest - Borough of Bellmawr**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	1	FEMA
Other Flood Risk Areas	1	Community

  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.4 Borough of Brooklawn (CID 340127)

The information below provides an overview of the Borough of Brooklawn as of the date of this publication.

3.3.4.1 Overview

The Borough of Brooklawn is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Borough of Brooklawn	340127	2,354	100	0.5	100	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 23 policies totaling approximately $ 6,492,800
- NFIP-recognized repetitive loss properties = 4
- NFIP-recognized severe repetitive loss properties = 1

Data provided below only includes areas within the Borough of Brooklawn that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.4.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within the Borough of Brooklawn were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.2	0.0	0.0	0.0
Within Floodway	N/A	N/A	N/A	N/A
Within Non-SFHA	0.1	0.0	-0.1	0.0
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Borough of Brooklawn, the figures in this table only represent information within the Borough of Brooklawn.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The Borough of Brooklawn flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	Borough of Brooklawn - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$120,100,000	41%	$300,000	<1%	$20,400,000	17%	$28,500,000	24%	$55,400,000	46%	$700,000	<1%
Commercial Building and Contents Losses	$129,300,000	44%	$400,000	<1%	$47,400,000	37%	$52,000,000	40%	$60,500,000	47%	$1,100,000	<1%
Other Building and Contents Losses	$44,700,000	15%	$80,000	<1%	$13,600,000	30%	$14,500,000	32%	$16,900,000	38%	$300,000	<1%
Total Building and Contents Losses[3]	$294,100,000	100%	$780,000	<1%	$81,400,000	28%	$95,000,000	32%	$132,800,000	45%	$2,100,000	<1%
Business Disruption[4]	N/A	N/A	$30,000	N/A	$4,500,000	N/A	$4,800,000	N/A	$5,300,000	N/A	$90,000	N/A
TOTAL[5]	$294,100,000	100%	$810,000	<1%	$85,900,000	29%	$99,800,000	34%	$138,100,000	47%	$2,190,000	<1%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Borough of Brooklawn - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$120,100,000	41%	N/A	N/A	N/A	N/A	$2,400,000	2%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$129,300,000	44%	N/A	N/A	N/A	N/A	$4,300,000	3%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$44,700,000	15%	N/A	N/A	N/A	N/A	$900,000	2%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$294,100,000	100%	N/A	N/A	N/A	N/A	$7,600,000	3%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	$70,000	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$294,100,000	100%	N/A	N/A	N/A	N/A	$7,670,000	3%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest - Borough of Brooklawn**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	2	FEMA
At Risk Essential Facilities	1	FEMA
Other Flood Risk Areas	1	Community

  - Evidence of actual flood losses can be one of the most compelling factors for increasing a community's flood risk awareness. One indicator is claims through the NFIP. Past claims are represented within the City at the centroid of each respective Census Block to indicate the vicinity of known areas of flooding. Also, many times it is necessary to move the location to the nearest road or any such discreet area to avoid pin-pointing specific home/building.
  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

- *This page left intentionally blank.*

3.3.5 Borough of Collingswood (CID 340131)

The information below provides an overview of the Borough of Collingswood as of the date of this publication.

3.3.5.1 Overview

The Borough of Collingswood is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Borough of Collingswood	340131	14,326	91	1.9	92	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 80 policies totaling approximately $ 19,728,000
- NFIP-recognized repetitive loss properties = 2
- NFIP-recognized severe repetitive loss properties = 2

Data provided below only includes areas within the Borough of Collingswood that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.5.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within the Borough of Collingswood were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.3	0.0	0.0	0.0
Within Floodway	0.1	0.0	0.0	0.0
Within Non-SFHA	0.1	0.0	0.0	0.0
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Borough of Collingswood, the figures in this table only represent information within the Borough of Collingswood.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The Borough of Collingswood flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	Borough of Collingswood - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$1,103,400,000	68%	$500,000	<1%	$700,000	<1%	$700,000	<1%	$130,300,000	12%	$400,000	<1%
Commercial Building and Contents Losses	$391,900,000	24%	$100,000	<1%	$200,000	<1%	$200,000	<1%	$72,200,000	18%	$200,000	<1%
Other Building and Contents Losses	$134,300,000	8%	$60,000	<1%	$60,000	<1%	$60,000	<1%	$23,800,000	18%	$70,000	<1%
Total Building and Contents Losses[3]	$1,629,600,000	100%	$660,000	<1%	$960,000	<1%	$960,000	<1%	$226,300,000	14%	$670,000	<1%
Business Disruption[4]	N/A	N/A	$10,000	N/A	$10,000	N/A	$10,000	N/A	$5,300,000	N/A	N/A	N/A
TOTAL[5]	$1,629,600,000	100%	$670,000	<1%	$970,000	<1%	$970,000	<1%	$231,600,000	14%	$670,000	<1%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Borough of Collingswood - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$1,103,400,000	68%	N/A	N/A	N/A	N/A	$1,200,000	<1%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$391,900,000	24%	N/A	N/A	N/A	N/A	$1,000,000	<1%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$134,300,000	8%	N/A	N/A	N/A	N/A	$200,000	<1%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$1,629,600,000	100%	N/A	N/A	N/A	N/A	$2,400,000	<1%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	$10,000	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$1,629,600,000	100%	N/A	N/A	N/A	N/A	$2,410,000	<1%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest - Borough of Collingswood**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	0	N/A

  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

- *This page left intentionally blank.*

3.3.6 Borough of Haddon Heights (CID 340136)

The information below provides an overview of the Borough of Haddon Heights as of the date of this publication.

3.3.6.1 Overview

The Borough of Haddon Heights is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Borough of Haddon Heights	340136	7,547	14	1.6	16	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 9 policies totaling approximately $ 2,506,000
- NFIP-recognized repetitive loss properties = 1
- NFIP-recognized severe repetitive loss properties = 2

Data provided below only includes areas within the Borough of Haddon Heights that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.6.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within the Borough of Haddon Heights were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.0	0.0	0.0	0.0
Within Floodway	N/A	N/A	N/A	N/A
Within Non-SFHA	N/A	N/A	N/A	N/A
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Borough of Haddon Heights, the figures in this table only represent information within the Borough of Haddon Heights.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The Borough of Haddon Heights flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	Borough of Haddon Heights - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$37,300,000	77%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$6,700,000	14%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$4,500,000	9%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$48,500,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$48,500,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Borough of Haddon Heights - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$37,300,000	77%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$6,700,000	14%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$4,500,000	9%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$48,500,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$48,500,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest - Borough of Haddon Heights**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	0	N/A

  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.7 Borough of Merchantville (CID 340569)

The information below provides an overview of the Borough of Merchantville as of the date of this publication.

3.3.7.1 Overview

The Borough of Merchantville is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Borough of Merchantville	340569	3,801	9	0.6	6	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 6 policies totaling approximately $ 2,100,000
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within the Borough of Merchantville that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.7.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within the Borough of Merchantville were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	N/A	N/A	N/A	N/A
Within Floodway	N/A	N/A	N/A	N/A
Within Non-SFHA	N/A	N/A	N/A	N/A
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Borough of Merchantville, the figures in this table only represent information within the Borough of Merchantville.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The Borough of Merchantville flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	Borough of Merchantville - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$11,000,000	55%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$7,700,000	38%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$1,400,000	7%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$20,100,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$20,100,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Borough of Merchantville - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$11,000,000	55%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$7,700,000	38%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$1,400,000	7%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$20,100,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$20,100,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest - Borough of Merchantville**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	0	N/A

  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
    -
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.8 Borough of Mount Ephraim (CID 340140)

The information below provides an overview of the Borough of Mount Ephraim as of the date of this publication.

3.3.8.1 Overview

Borough of Mount Ephraim is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Borough of Mount Ephraim	340140	4,495	39	0.9	45	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 16 policies totaling approximately $ 3,662,900
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within Borough of Mount Ephraim that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.8.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within Borough of Mount Ephraim were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.1	0.0	0.0	0.0
Within Floodway	0.0	0.0	0.0	0.0
Within Non-SFHA	0.0	0.0	0.0	0.0
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Borough of Mount Ephraim, the figures in this table only represent information within Borough of Mount Ephraim.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

	Borough of Mount Ephraim - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$92,500,000	74%	N/A	N/A	$70,000	<1%	$100,000	<1%	$2,600,000	3%	$10,000	<1%
Commercial Building and Contents Losses	$21,300,000	17%	N/A	N/A	$10,000	<1%	$10,000	<1%	$1,500,000	7%	N/A	N/A
Other Building and Contents Losses	$10,700,000	9%	N/A	N/A	N/A	N/A	N/A	N/A	$30,000	<1%	N/A	N/A
Total Building and Contents Losses[3]	$124,500,000	100%	N/A	N/A	$80,000	<1%	$110,000	<1%	$4,130,000	3%	$10,000	<1%
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$60,000	N/A	N/A	N/A
TOTAL[5]	$124,500,000	100%	N/A	N/A	$80,000	<1%	$110,000	<1%	$4,190,000	3%	$10,000	<1%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Borough of Mount Ephraim - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$92,500,000	74%	N/A	N/A	N/A	N/A	$3,400,000	4%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$21,300,000	17%	N/A	N/A	N/A	N/A	$300,000	1%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$10,700,000	9%	N/A	N/A	N/A	N/A	$60,000	<1%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$124,500,000	100%	N/A	N/A	N/A	N/A	$3,760,000	3%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$124,500,000	100%	N/A	N/A	N/A	N/A	$3,760,000	3%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest – Borough of Mount Ephraim**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	0	N/A

  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.9 Borough of Oaklyn (CID 340141)

The information below provides an overview of the Borough of Oaklyn as of the date of this publication.

3.3.9.1 Overview

The Borough of Oaklyn is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Borough of Oaklyn	340141	4,188	10	0.7	19	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 9 policies totaling approximately $ 2,515,000
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within Borough of Oaklyn that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.9.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within Borough of Oaklyn were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.0	0.0	0.0	0.0
Within Floodway	0.0	0.0	0.0	0.0
Within Non-SFHA	0.0	0.0	0.0	0.0
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Borough of Oaklyn, the figures in this table only represent information within Borough of Oaklyn.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

	Borough of Oaklyn- Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$17,100,000	41%	N/A	N/A	N/A	N/A	N/A	N/A	$200,000	1%	N/A	N/A
Commercial Building and Contents Losses	$21,300,000	51%	N/A	N/A	N/A	N/A	N/A	N/A	$100,000	<1%	N/A	N/A
Other Building and Contents Losses	$3,700,000	9%	N/A	N/A	N/A	N/A	N/A	N/A	$60,000	2%	N/A	N/A
Total Building and Contents Losses[3]	$42,100,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	$360,000	<1%	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$10,000	N/A	N/A	N/A
TOTAL[5]	$42,100,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	$370,000	<1%	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Borough of Oaklyn - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$17,100,000	41%	N/A	N/A	N/A	N/A	$10,000	<1%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$21,300,000	51%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$3,700,000	9%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$42,100,000	100%	N/A	N/A	N/A	N/A	$10,000	<1%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$42,100,000	100%	N/A	N/A	N/A	N/A	$10,000	<1%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest – Borough of Oaklyn**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas*	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	0	N/A

  - Dam-break flooding can be a significant hazard to life and property. Readers are encouraged to direct any dam-related issues or questions to the State of New Jersey, Department of Environmental Protection – Dam Safety & Flood Control Section (http://www.nj.gov/dep/damsafety/index.htm).
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.10 Borough of Runnemede (CID 340144)

The information below provides an overview of the Borough of Runnemede as of the date of this publication.

3.3.10.1 Overview

The Borough of Runnemede is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Borough of Runnemede	340144	8,533	79	2.1	83	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 6 policies totaling approximately $ 1,486,000
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within Borough of Runnemede that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.10.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within Borough of Runnemede were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.3	0.0	0.0	0.0
Within Floodway	0.0	0.0	0.0	0.0
Within Non-SFHA	0.1	0.0	0.0	0.0
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Borough of Runnemede, the figures in this table only represent information within Borough of Runnemede.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

	Borough of Runnemede- Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$435,800,000	64%	$5,400,000	1%	$6,500,000	1%	$7,400,000	2%	$7,400,000	2%	$600,000	<1%
Commercial Building and Contents Losses	$178,600,000	26%	$300,000	<1%	$300,000	<1%	$300,000	<1%	$300,000	<1%	$30,000	<1%
Other Building and Contents Losses	$70,000,000	10%	$1,100,000	2%	$1,200,000	2%	$1,300,000	2%	$1,300,000	2%	$100,000	<1%
Total Building and Contents Losses[3]	$684,400,000	100%	$6,800,000	<1%	$8,000,000	1%	$9,000,000	1%	$9,000,000	1%	$730,000	<1%
Business Disruption[4]	N/A	N/A	$200,000	N/A	$200,000	N/A	$200,000	N/A	$200,000	N/A	$20,000	N/A
TOTAL[5]	$684,400,000	100%	$7,000,000	1%	$8,200,000	1%	$9,200,000	1%	$9,200,000	1%	$750,000	<1%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Borough of Runnemede - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$435,800,000	64%	N/A	N/A	N/A	N/A	$700,000	<1%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$178,600,000	26%	N/A	N/A	N/A	N/A	$200,000	<1%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$70,000,000	10%	N/A	N/A	N/A	N/A	$200,000	<1%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$684,400,000	100%	N/A	N/A	N/A	N/A	$1,100,000	<1%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$684,400,000	100%	N/A	N/A	N/A	N/A	$1,100,000	<1%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest – Borough of Runnemede**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	1	State
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	0	N/A

  - Dam-break flooding can be a significant hazard to life and property. Readers are encouraged to direct any dam-related issues or questions to the State of New Jersey, Department of Environmental Protection – Dam Safety & Flood Control Section (http://www.nj.gov/dep/damsafety/index.htm).
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.11 Borough of Woodlynne (CID 340149)

The information below provides an overview of the Borough of Woodlynne as of the date of this publication.

3.3.11.1 Overview

The Borough of Woodlynne is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Borough of Woodlynne	340149	2,796	100	0.2	100	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 61 policies totaling approximately $ 7,343,000
- NFIP-recognized repetitive loss properties = 3
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within the Borough of Woodlynne that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.11.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within the Borough of Woodlynne were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.1	0.0	0.0	0.0
Within Floodway	0.0	0.0	0.0	0.0
Within Non-SFHA	0.0	0.0	0.0	0.0
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Borough of Woodlynne, the figures in this table only represent information within the Borough of Woodlynne.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The Borough of Woodlynne flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	Borough of Woodlynne - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$182,500,000	77%	N/A	N/A	$60,000	<1%	$80,000	<1%	$60,200,000	33%	$200,000	<1%
Commercial Building and Contents Losses	$27,100,000	11%	N/A	N/A	$10,000	<1%	$10,000	<1%	$9,100,000	34%	$30,000	<1%
Other Building and Contents Losses	$28,500,000	12%	N/A	N/A	N/A	N/A	N/A	N/A	$12,500,000	44%	$50,000	<1%
Total Building and Contents Losses[3]	$238,100,000	100%	N/A	N/A	$70,000	<1%	$90,000	<1%	$81,800,000	34%	$280,000	<1%
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$1,700,000	N/A	$10,000	N/A
TOTAL[5]	$238,100,000	100%	N/A	N/A	$70,000	<1%	$90,000	<1%	$83,500,000	35%	$290,000	<1%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Borough of Woodlynne - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$182,500,000	77%	N/A	N/A	N/A	N/A	$6,100,000	3%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$27,100,000	11%	N/A	N/A	N/A	N/A	$500,000	2%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$28,500,000	12%	N/A	N/A	N/A	N/A	$2,900,000	10%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$238,100,000	100%	N/A	N/A	N/A	N/A	$9,500,000	4%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	$200,000	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$238,100,000	100%	N/A	N/A	N/A	N/A	$9,700,000	4%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest - Borough of Woodlynne**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	0	N/A

  - No Areas of Mitigation Interest were identified for this project.
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.12 City of Camden (CID 340128)

The information below provides an overview of the City of Camden as of the date of this publication.

3.3.12.1 Overview

The City of Camden is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
City of Camden	340128	79,904	100	10.5	100	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 761 policies totaling approximately $ 125,627,200
- NFIP-recognized repetitive loss properties = 28
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within the City of Camden that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.12.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within the City of Camden were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	3.7	0.2	-0.6	-0.4
Within Floodway	0.0	0.0	0.0	0.0
Within Non-SFHA	2.3	0.2	-1.0	-0.8
Within CHHA	0.4	0.4	0.0	0.4

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of City of Camden, the figures in this table only represent information within the City of Camden.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The City of Camden flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	City of Camden- Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$4,567,100,000	52%	$37,900,000	<1%	$786,800,000	17%	$990,600,000	22%	$1,261,500,000	28%	$23,400,000	<1%
Commercial Building and Contents Losses	$2,378,500,000	27%	$99,300,000	4%	$735,200,000	31%	$945,600,000	40%	$1,067,500,000	45%	$27,300,000	1%
Other Building and Contents Losses	$1,794,400,000	21%	$95,400,000	5%	$621,500,000	35%	$686,700,000	38%	$770,300,000	43%	$23,300,000	1%
Total Building and Contents Losses[3]	$8,740,000,000	100%	$232,600,000	3%	$2,143,500,000	25%	$2,622,900,000	30%	$3,099,300,000	35%	$74,000,000	<1%
Business Disruption[4]	N/A	N/A	$17,800,000	N/A	$100,700,000	N/A	$106,800,000	N/A	$119,300,000	N/A	$3,600,000	N/A
TOTAL[5]	$8,740,000,000	100%	$250,400,000	3%	$2,244,200,000	26%	$2,729,700,000	31%	$3,218,600,000	37%	$77,600,000	<1%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	City of Camden - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$4,567,100,000	52%	N/A	N/A	N/A	N/A	$63,000,000	1%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$2,378,500,000	27%	N/A	N/A	N/A	N/A	$86,400,000	4%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$1,794,400,000	21%	N/A	N/A	N/A	N/A	$155,300,000	9%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$8,740,000,000	100%	N/A	N/A	N/A	N/A	$304,700,000	3%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	$2,100,000	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$8,740,000,000	100%	N/A	N/A	N/A	N/A	$306,800,000	4%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest – City of Camden**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	1	State
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	2	FEMA
At Risk Essential Facilities	13	FEMA

  - Dam-break flooding can be a significant hazard to life and property. Readers are encouraged to direct any dam-related issues or questions to the State of New Jersey, Department of Environmental Protection – Dam Safety & Flood Control Section (http://www.nj.gov/dep/damsafety/index.htm).
  - Evidence of actual flood losses can be one of the most compelling factors for increasing a community's flood risk awareness. One indicator is claims through the NFIP. Past claims are represented within the City at the centroid of each respective Census Block to indicate the vicinity of known areas of flooding. Also, many times it is necessary to move the location to the nearest road or any such discreet area to avoid pin-pointing specific home/building.
  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.13 City of Gloucester City (CID 340132)

The information below provides an overview of the City of Gloucester City as of the date of this publication.

3.3.13.1 Overview

The City of Gloucester City is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
City of Gloucester City	340132	11,484	100	2.8	100	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 118 policies totaling approximately $ 23,027,700
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within the City of Gloucester City that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.13.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within the City of Gloucester City were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	1.1	0.0	-0.2	-0.2
Within Floodway	0.0	0.0	0.0	0.0
Within Non-SFHA	0.6	0.0	-0.2	-0.2
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of City of Gloucester City, the figures in this table only represent information within the City of Gloucester City.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The City of Gloucester City flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	City of Gloucester City - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$735,700,000	61%	$9,000,000	1%	$260,300,000	35%	$288,200,000	39%	$325,200,000	44%	$6,900,000	<1%
Commercial Building and Contents Losses	$214,400,000	18%	$11,600,000	5%	$91,000,000	42%	$96,300,000	45%	$101,400,000	47%	$3,000,000	1%
Other Building and Contents Losses	$252,300,000	21%	$52,500,000	21%	$115,100,000	46%	$122,400,000	49%	$138,300,000	55%	$7,300,000	3%
Total Building and Contents Losses[3]	$1,202,400,000	100%	$73,100,000	6%	$466,400,000	39%	$506,900,000	42%	$564,900,000	47%	$17,200,000	1%
Business Disruption[4]	N/A	N/A	$7,300,000	N/A	$15,600,000	N/A	$16,100,000	N/A	$17,200,000	N/A	$900,000	N/A
TOTAL[5]	$1,202,400,000	100%	$80,400,000	7%	$482,000,000	40%	$523,000,000	43%	$582,100,000	48%	$18,100,000	2%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	City of Gloucester City - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$735,700,000	61%	N/A	N/A	N/A	N/A	$11,500,000	2%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$214,400,000	18%	N/A	N/A	N/A	N/A	$9,300,000	4%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$252,300,000	21%	N/A	N/A	N/A	N/A	$46,100,000	18%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$1,202,400,000	100%	N/A	N/A	N/A	N/A	$66,900,000	6%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	$200,000	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$1,202,400,000	100%	N/A	N/A	N/A	N/A	$67,100,000	6%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest – City of Gloucester City**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	5	FEMA

  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.14 Township of Cherry Hill (CID 340129)

The information below provides an overview of the Township of Cherry Hill as of the date of this publication.

3.3.14.1 Overview

The Township of Cherry Hill is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Township of Cherry Hill	340129	69,965	0	24.2	0	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 295 policies totaling approximately $ 87,008,100
- NFIP-recognized repetitive loss properties = 8
- NFIP-recognized severe repetitive loss properties = 1

Data provided below only includes areas within the Township of Cherry Hill that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.14.2 Community Analyses and Results

- **Changes Since Last FIRM**
  - Special Flood Hazard Area (SFHA) boundaries within the Township of Cherry Hill were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.0	0.0	0.0	0.0
Within Floodway	0.0	0.0	0.0	0.0
Within Non-SFHA	0.0	0.0	0.0	0.0
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Township of Cherry Hill, the figures in this table only represent information within the Township of Cherry Hill.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The Township of Cherry Hill flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	Township of Cherry Hill - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$400,000	50%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$400,000	50%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$800,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$800,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Township of Cherry Hill - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$400,000	50%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$400,000	50%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$800,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$800,000	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest - Township of Cherry Hill**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	0	N/A

  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.15 Township of Gloucester (CID 340133)

The information below provides an overview of the Township of Gloucester as of the date of this publication.

3.3.15.1 Overview

The Township of Gloucester is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Township of Gloucester	340133	64,350	14	23.3	11	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 85 policies totaling approximately $ 22,307,700
- NFIP-recognized repetitive loss properties = 0
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within the Township of Gloucester that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.15.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within the Township of Gloucester were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.3	0.0	0.0	0.0
Within Floodway	0.2	0.0	0.0	0.0
Within Non-SFHA	0.1	0.0	0.0	0.0
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Township of Gloucester, the figures in this table only represent information within the Township of Gloucester.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The Township of Gloucester flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	Township of Gloucester - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$619,200,000	71%	$24,400,000	4%	$29,300,000	5%	$32,000,000	5%	$36,500,000	6%	$2,800,000	<1%
Commercial Building and Contents Losses	$163,000,000	19%	$2,500,000	2%	$2,900,000	2%	$3,000,000	2%	$3,400,000	2%	$300,000	<1%
Other Building and Contents Losses	$94,000,000	11%	$2,200,000	2%	$2,600,000	3%	$2,800,000	3%	$3,500,000	4%	$300,000	<1%
Total Building and Contents Losses[3]	$876,200,000	100%	$29,100,000	3%	$34,800,000	4%	$37,800,000	4%	$43,400,000	5%	$3,400,000	<1%
Business Disruption[4]	N/A	N/A	$400,000	N/A	$500,000	N/A	$500,000	N/A	$600,000	N/A	$40,000	N/A
TOTAL[5]	$876,200,000	100%	$29,500,000	3%	$35,300,000	4%	$38,300,000	4%	$44,000,000	5%	$3,440,000	<1%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Township of Gloucester - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$619,200,000	71%	N/A	N/A	N/A	N/A	$12,700,000	2%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$163,000,000	19%	N/A	N/A	N/A	N/A	$900,000	<1%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$94,000,000	11%	N/A	N/A	N/A	N/A	$400,000	<1%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$876,200,000	100%	N/A	N/A	N/A	N/A	$14,000,000	2%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	$10,000	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$876,200,000	100%	N/A	N/A	N/A	N/A	$14,010,000	2%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest - Township of Gloucester**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	0	N/A
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	0	N/A

  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.16 Township of Haddon (CID 340134)

The information below provides an overview of the Township of Haddon as of the date of this publication.

3.3.16.1 Overview

The Township of Haddon is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Township of Haddon	340134	14,651	11	2.8	17	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 45 policies totaling approximately $ 11,083,300
- NFIP-recognized repetitive loss properties = 1
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within the Township of Haddon that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.16.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within the Township of Haddon were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	0.1	0.0	0.0	0.0
Within Floodway	0.0	0.0	0.0	0.0
Within Non-SFHA	0.1	0.0	-0.1	-0.1
Within CHHA	N/A	N/A	N/A	N/A

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Township of Haddon, the figures in this table only represent information within the Township of Haddon.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The Township of Haddon flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	Township of Haddon - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$86,200,000	59%	N/A	N/A	$4,300,000	5%	$5,600,000	6%	$28,300,000	33%	$200,000	<1%
Commercial Building and Contents Losses	$42,000,000	29%	N/A	N/A	$4,900,000	12%	$5,300,000	13%	$13,000,000	31%	$100,000	<1%
Other Building and Contents Losses	$18,300,000	12%	N/A	N/A	$2,800,000	15%	$3,000,000	16%	$7,000,000	38%	$80,000	<1%
Total Building and Contents Losses[3]	$146,500,000	100%	N/A	N/A	$12,000,000	8%	$13,900,000	9%	$48,300,000	33%	$380,000	<1%
Business Disruption[4]	N/A	N/A	N/A	N/A	$300,000	N/A	$300,000	N/A	$1,000,000	N/A	$10,000	N/A
TOTAL[5]	$146,500,000	100%	N/A	N/A	$12,300,000	8%	$14,200,000	10%	$49,300,000	34%	$390,000	<1%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Township of Haddon - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$86,200,000	59%	N/A	N/A	N/A	N/A	$1,700,000	2%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$42,000,000	29%	N/A	N/A	N/A	N/A	$1,400,000	3%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$18,300,000	12%	N/A	N/A	N/A	N/A	$100,000	<1%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$146,500,000	100%	N/A	N/A	N/A	N/A	$3,200,000	2%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	$20,000	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$146,500,000	100%	N/A	N/A	N/A	N/A	$3,220,000	2%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest - Township of Haddon**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	2	State
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	0	N/A

  - Flooding of important or key emergency roadways could disrupt travel for transit users and drivers and potentially place life and property at risk. In addition, the same flooding over key routes could prevent first-responders from reaching victims or severely affect their ability to transport victims to safety or medical care.
  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

3.3.17 Township of Pennsauken (CID 340142)

The information below provides an overview of the Township of Pennsauken as of the date of this publication.

3.3.17.1 Overview

The Township of Pennsauken is one of fourteen communities located within the Project Area. The information below provides an overview of the community's floodplain management program information as of the date of this publication.

Community Name	CID	Total Community Population (Census 2000)	Percent of Population in Project	Total Community Land Area (sq mi)	Percent of Land Area in Project	NFIP	CRS Rating	Mitigation Plan
Township of Pennsauken	340142	35,737	53	12.2	63	Y	10	Y

- Participating in the Camden County Multi-Jurisdictional Hazard Mitigation Plan which will expire 10/16/2016
- Past Federal Disaster Declarations for flooding = 5
- National Flood Insurance Program (NFIP) policy coverage (policies/value) = 126 policies totaling approximately $ 38,018,900
- NFIP-recognized repetitive loss properties = 3
- NFIP-recognized severe repetitive loss properties = 0

Data provided below only includes areas within the Township of Pennsauken that area located within the Camden County Coastal Project Area Flood Risk Project, and do not necessarily represent community-wide totals. Section 2 of the Flood Risk Report (FRR) provides more information regarding the source and methodology used to develop the information presented below. Datasets used toward the generation of results of this project are described in Section 7 of the FRR and are found in the Flood Risk Database (FRD).

3.3.17.2 Community Analyses and Results

- **Changes Since Last FIRM**
    - Special Flood Hazard Area (SFHA) boundaries within the Township of Pennsauken were updated due to new coastal engineering analysis. The updated modeling produced new Preliminary flood zone areas and new base flood elevations and leveraged recent LiDAR-based topographic data. The data in this section reflects the comparison between the effective FIRM and the new analysis in this study.

The table below summarizes the increases, decreases, and net change of SFHAs for the community.

Area of Study	Total Area (mi^2)	Increase (mi^2)	Decrease (mi^2)	Net Change (mi^2)
Within SFHA	2.4	0.2	-0.5	-0.3
Within Floodway	0.0	0.0	0.0	0.0
Within Non-SFHA	1.0	0.0	-0.3	-0.2
Within CHHA	0.6	0.6	0.0	0.6

*Although the Flood Risk Database may contain Changes Since Last FIRM information outside of Township of Pennsauken, the figures in this table only represent information within the Township of Pennsauken.

Section 2 of the FRR provides more information regarding the source and methodology used to develop this table.

- **Flood Depth and Analysis Grids**
  - See the FRD for the following depth and analysis grid data (Section 2 of the FRR provides general information regarding the development of and potential uses for this data):
    - 1-percent annual chance of flooding grid
    - Hillshade of the project area
  - Additional information and data layers provided within the FRD should be used to further isolate these and other areas where flood mitigation potential is high. The FRD includes data which may be helpful in planning and implementing mitigation strategies. Properties located in areas expected to experience some depth of water should seriously consider mitigation options for implementation.
  - The new depth grid provided in the FRD includes Stillwater elevations that represent elevations from the wave height analysis based on storm surge results and is the basis for final work map coastal flood zones.

- **Flood Risk Results Information (Hazus Estimated Loss information)**
  - The Township of Pennsauken flood risk analysis incorporates results from a FEMA-performed Hazus analysis which accounts for average annualized loss (2010 AAL) within the community. These data are presented for the coastally influenced areas within the Coastal Project Area for Camden County following the geographic extents of other FEMA Flood Insurance Studies for Camden County. FEMA's 2010 AAL results are included in the Flood Risk Database within the standalone GIS Table > L_RA_AAL.
  - A Hazus "Level-2" analysis was also performed for the Coastal Project Area that is consistent with other FEMA Flood Insurance Studies for Camden County. Both the Total Inventory of potential losses and the estimated loss results are calculated for this project area and each community.
  - Both Hazus loss estimations (2010 AAL and Refined 1%) utilize the Hazus Version 2.1 default General Building Stock (GBS) data.

	Township of Pennsauken - Estimated Potential Losses for Flood Event Scenarios (2010 AAL)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$1,246,300,000	31%	$7,600,000	<1%	$8,600,000	<1%	$9,200,000	<1%	$13,900,000	1%	$800,000	<1%
Commercial Building and Contents Losses	$1,378,800,000	34%	$2,900,000	<1%	$9,400,000	<1%	$26,900,000	2%	$57,800,000	4%	$900,000	<1%
Other Building and Contents Losses	$1,400,100,000	35%	$3,800,000	<1%	$23,400,000	2%	$46,000,000	3%	$114,600,000	8%	$1,900,000	<1%
Total Building and Contents Losses[3]	$4,025,200,000	100%	$14,300,000	<1%	$41,400,000	1%	$82,100,000	2%	$186,300,000	5%	$3,600,000	<1%
Business Disruption[4]	N/A	N/A	$500,000	N/A	$3,600,000	N/A	$6,800,000	N/A	$13,700,000	N/A	$200,000	N/A
TOTAL[5]	$4,025,200,000	100%	$14,800,000	<1%	$45,000,000	1%	$88,900,000	2%	$200,000,000	5%	$3,800,000	<1%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.

[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.

[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.

[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

	Township of Pennsauken - Estimated Potential Losses for Flood Event Scenarios (Refined 1%)											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized ($/yr)	
	Estimated Value	% of Total	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]	Dollar Losses[1]	Loss Ratio[2]
Residential Building and Contents Losses	$1,246,300,000	31%	N/A	N/A	N/A	N/A	$4,500,000	<1%	N/A	N/A	N/A	N/A
Commercial Building and Contents Losses	$1,378,800,000	34%	N/A	N/A	N/A	N/A	$10,800,000	<1%	N/A	N/A	N/A	N/A
Other Building and Contents Losses	$1,400,100,000	35%	N/A	N/A	N/A	N/A	$16,500,000	1%	N/A	N/A	N/A	N/A
Total Building and Contents Losses[3]	$4,025,200,000	100%	N/A	N/A	N/A	N/A	$31,800,000	<1%	N/A	N/A	N/A	N/A
Business Disruption[4]	N/A	N/A	N/A	N/A	N/A	N/A	$200,000	N/A	N/A	N/A	N/A	N/A
TOTAL[5]	$4,025,200,000	100%	N/A	N/A	N/A	N/A	$32,000,000	<1%	N/A	N/A	N/A	N/A

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.
[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000. Totals are NOT rounded.
[2]Loss ratio = Dollar Losses ÷ Estimated Value. Loss Ratios are rounded to the nearest integer percent.
[3]Total Building and Contents Losses = Residential Building and Contents Losses + Commercial Building and Contents Losses + Other Building and Contents Losses. Totals are NOT rounded.
[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss. Values are rounded per Note 1 above.
[5]Total Loss = Total Building and Contents Losses + Business Disruption. Totals are NOT rounded.

- **Areas of Mitigation Interest - Township of Pennsauken**
  - Section 2.2.4 of the FRR provides more information regarding areas of mitigation interest, how they are defined for this analysis, and potential mitigation actions that could be considered for each type. The table below summarizes the number of areas of mitigation interest by type.

Type of Mitigation Interest	Number of Areas	Data Source
Dam	1	State
Streamflow Constrictions	0	N/A
Key Emergency Routes Overtopped	0	N/A
Past Claims Hot Spot	0	N/A
At Risk Essential Facilities	2	FEMA

  - An essential facility is typically defined as a facility that must remain functional for the public good in the event of a major disaster. An essential facility as defined by the Hazus software includes the following types:
    - Medical Care Centers (Hospital or other medical care typically with beds)
    - Emergency Centers
      - Emergency Operation Center - typically where disaster operations are coordinated
      - Fire Stations
      - Police Stations
    - Schools – typically only public schools are considered and schools are also assumed to be emergency shelters
  - Readers and users of this work product are also encouraged to consult the most recent version of the Camden County Hazard Mitigation Plan (HMP) as it may provide other information not captured in this project.

This page left intentionally blank.

4 Actions to Reduce Flood Risk

In order to fully leverage the Flood Risk Datasets and Products created for this Flood Risk Project, local stakeholders should consider many different flood risk mitigation tactics, including, but not limited the items shown in the sub-sections below.

Before Mitigation and After Mitigation

Communities will need to prioritize projects as part of the planning process. FEMA can then help route federal mitigation dollars to fund these projects.

4.1 Types of Mitigation Actions

Mitigation provides a critical foundation on which to reduce loss of life and property by avoiding or lessening the impact of hazard events. This creates safer communities and facilitates resiliency by enabling communities to return to normal function as quickly as possible after a hazard event. Once a community understands its flood risk, it is in a better position to identify potential mitigation actions that can reduce the risk to its people and property.

The mitigation plan requirements in 44 CFR Part 201 encourage communities to understand their vulnerability to hazards and take actions to minimize vulnerability and promote resilience. Flood mitigation actions generally fall into the following categories:

4.1.1 Preventative Measures

Preventative measures are intended to keep flood hazards from getting worse. They can reduce future vulnerability to flooding, especially in areas where development has not yet occurred or where capital improvements have not been substantial. Examples include:

- Comprehensive land use planning
- Zoning regulations
- Subdivision regulations
- Open space preservation
- Building codes
- Floodplain development regulations
- Stormwater management
- Purchase development rights or conservation easements
- Participation in the NFIP Community Rating System (CRS)

NFIP's CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from community actions meeting the three goals of the CRS: to reduce flood losses, to facilitate accurate insurance rating, and to promote the awareness of flood insurance.

For CRS participating communities, flood insurance premium rates are discounted in increments of 5%; i.e., a Class 1 community would receive a 45% premium discount, while a Class 9 community would receive a 5% discount. (A Class 10 is not participating in the CRS and receives no discount.)

4.1.2 Property Protection Measures

Property protection measures protect existing buildings by

modifying the building to withstand floods, or by removing buildings from hazardous locations. Examples include:

- Building relocation
- Acquisition and clearance
- Building elevation
- Barrier installation
- Building retrofit

4.1.3 Natural Resource Protection Activities

Natural resource protection activities reduce the impact of floods by preserving or restoring natural areas such as floodplains, wetlands, and dunes and their natural functions. Examples include:

- Wetland protection
- Habitat protection
- Erosion and sedimentation control
- Best management practices (BMP)
- Prevention of stream dumping activities (anti-litter campaigns)
- Improved forestry practices such as reforesting or selective timbering (extraction)

4.1.4 Structural Mitigation Projects

Structural mitigation projects lessen the impact of floods by modifying the environmental natural progression of the flooding event. Structural protection such as upgrading dams/levees for already existing development and critical facilities may be a realistic alternative. However, citizens should be made aware of their residual risk. Examples include:

- Reservoirs, retention, and detention basins
- Levees and floodwalls
- Channel modifications
- Channel maintenance

4.1.5 Public Education and Awareness Activities

Public education and awareness activities advise residents, business owners, potential property buyers, and visitors about floods, hazardous

For more information regarding hazard mitigation techniques, best practices, and potential grant funding sources, visit www.fema.gov or contact your local floodplain manager, emergency manager, or State Hazard Mitigation Officer.

areas, and mitigation techniques they can use to reduce the flood risk to themselves and their property. Examples include:

- Readily available and readable updated maps
- Outreach projects
- Libraries
- Technical assistance
- Real estate disclosure
- Environmental education
- Risk information via the nightly news

4.1.6 Emergency Service Measures

Although not typically considered a mitigation technique, emergency service measures minimize the impact of flooding on people and property. These are actions commonly taken immediately prior to, during, or in response to a hazard event. Examples include:

- Hazard warning system
- Emergency response plan
- COOP and COG planning
- Critical facilities protection
- Health and safety maintenance
- Post flood recovery planning

In Section 3, specific AoMIs were identified. Table 4.1 below identifies possible mitigation actions for each AoMI to consider.

Table 4-1. Mitigation Actions for Areas of Mitigation Interest

AoMI	*Possible Actions to Reduce Flood Risk*
Dams	*Engineering assessment* *Dam upgrades and strengthening* *Emergency Action Plan* *Dam removal* *Easement creation in impoundment and downstream inundation areas*
Levees (accredited and non-accredited) and significant levee-like structures	*Generally same as dams above* *Purchase of flood insurance for at-risk structures*
Coastal Structures *Jetties* *Groynes* *Seawalls* *Other structures*	*Increase coastal setbacks for construction* *Habitat restoration programs* *Wetland restoration and mitigation banking programs*
Stream Flow Pinch Point *Undersized culverts or bridge openings*	*Engineering analysis* *Replacement of structure pre- and post-disaster*
Past Claims and IA/PA Hot Spots	*Acquisition* *Elevation* *Relocation* *Floodproofing*
Major Land Use Changes (past 5 years or next 5 years)	*Higher regulatory standard* *Stormwater BMPs* *Transfer of Development rights* *Compensatory storage and equal conveyance standards*
Key Emergency Routes Overtopped During Frequent Flooding Events	*Elevation* *Creation of alternate routes* *Design as low water crossing*
Areas of Significant Riverine or Coastal Erosion	*Relocation of buildings and infrastructure* *Regulations and planning* *Natural vegetation* *Hardening*
Drainage or Stormwater- Based Flood Hazard Areas, or Areas Not Identified as Floodprone on the FIRM But Known to be Inundated	*Identification of all flood hazard areas*
Areas of Mitigation Success	*N/A*

4.2 Identifying Specific Actions for Your Community

As many mitigation actions are possible to lessen the impact of floods, how can a community decide which ones are appropriate to implement? There are many ways to identify specific actions most appropriate for a community. Some factors to consider may include the following:

- **Site characteristics.** Does the site present unique challenges (e.g., significant slopes or erosion potential)?
- **Flood characteristics.** Are the flood waters affecting the site fast or slow moving? Is there debris associated with the flow? How deep is the flooding?
- **Social acceptance.** Will the mitigation action be acceptable to the public? Does it cause social or cultural problems?
- **Technical feasibility.** Is the mitigation action technically feasible (e.g., making a building watertight to a reasonable depth)?
- **Administrative feasibility.** Is there administrative capability to implement the mitigation action?
- **Legal.** Does the mitigation action meet all applicable codes, regulations, and laws? Public officials may have a legal responsibility to act and inform citizens if a known hazard has been identified.
- **Economic.** Is the mitigation action affordable? Is it eligible under grant or other funding programs? Can it be completed within existing budgets?
- **Environmental.** Does the mitigation action cause adverse impacts on the environment or can they be mitigated? Is it the most appropriate action among the possible alternatives?

Refer to FEMA Mitigation Planning How To Guide #3 (FEMA 386-3) "Developing the Mitigation Plan - Identifying Mitigation Actions and Implementation Strategies" for more information on how to identify specific mitigation actions to address hazard risk in your community.

FEMA in collaboration with the American Planning Association has released the publication, "Integrating Hazard Mitigation into Local Planning." This guide explains how hazard mitigation can be incorporated into several different types of local planning programs. For more information go to www.planning.org. or http://www.fema.gov/library.

Your local Hazard Mitigation Plan is a valuable place to identify and prioritize possible mitigation actions. The plan includes a mitigation strategy with mitigation actions that were developed through a public and open process. You can then add to or modify those actions based on what is learned during the course of the Risk MAP project and the information provided within this FRR.

4.3 Mitigation Programs and Assistance

Not all mitigation activities require funding (e.g., local policy actions such as strengthening a flood damage prevention ordinance), and those that do are not limited to outside funding sources (e.g., inclusion in local capital improvements plan, etc.). For those mitigation actions that require assistance through funding or technical expertise, several state

and federal agencies have flood hazard mitigation grant programs and offer technical assistance. These programs may be funded at different levels over time or may be activated under special circumstances such as after a presidential disaster declaration.

Communities can link hazard mitigation plans and actions to the right FEMA grant programs to fund flood risk reduction. More information about FEMA HMA programs can be found at http://www.fema.gov/government/grant/hma/index.shtm.

4.3.1 FEMA Mitigation Programs and Assistance

FEMA awards many mitigation grants each year to states and communities to undertake mitigation projects to prevent future loss of life and property resulting from hazard impacts, including flooding. The FEMA Hazard Mitigation Assistance (HMA) programs provide grants for mitigation through the programs listed in Table 4.2 below.

Table 4-2. FEMA Hazard Mitigation Assistance Programs

Mitigation Grant Program	Authorization	Purpose
Hazard Mitigation Grant Program (HMGP)	Robert T. Stafford Disaster Relief and Emergency Assistance Act	Activated after a presidential disaster declaration; provides funds on a sliding scale formula based on a percentage of the total federal assistance for a disaster for long-term mitigation measures to reduce vulnerability to natural hazards
Flood Mitigation Assistance (FMA)	National Flood Insurance Reform Act	Reduce or eliminate claims against the NFIP
Pre-Disaster Mitigation (PDM)	Disaster Mitigation Act	National competitive program focused on mitigation project and planning activities that address multiple natural hazards
Repetitive Flood Claims (RFC)	Bunning-Bereuter-Blumenauer Flood Insurance Reform Act	Reduce flood claims against the NFIP through flood mitigation; properties must be currently NFIP insured and have had at least one NFIP claim
Severe Repetitive Loss (SRL)	Bunning-Bereuter-Blumenauer Flood Insurance Reform Act	Reduce or eliminate the long-term risk of flood damage to SRL residential structures currently insured under the NFIP

The HMGP and PDM programs offer funding for mitigation planning and project activities that address multiple natural hazard events. The FMA, RFC, and SRL programs focus funding efforts on reducing claims against the NFIP. Funding under the HMA programs is subject to availability of annual appropriations, and HMGP funding is also subject to the amount of FEMA disaster recovery assistance provided under a presidential major disaster declaration.

FEMA's HMA grants are awarded to eligible states, tribes, and territories (applicant) that, in turn, provide sub-grants to local governments and communities (sub-applicant). The applicant selects and prioritizes sub-applications developed and submitted to them by sub-applicants and submits them to FEMA for funding consideration. Prospective sub-applicants should consult the office designated as their applicant for further information regarding specific program and application requirements. Contact information for the FEMA Regional Offices and State Hazard Mitigation Officers (SHMO) is available on the FEMA website (www.fema.gov).

4.3.2 Additional Mitigation Programs and Assistance

Several additional agencies including USACE, Natural Resource Conservation Service (NRCS), U.S. Geological Survey (USGS), and others have specialists on staff and can offer further information on flood hazard mitigation. The State NFIP Coordinator and SHMO are state-level sources of information and assistance, which vary among different states.

The Silver Jackets program, active in several states, is a partnership of USACE, FEMA, and state agencies. The Silver Jackets program provides a state-based strategy for an interagency approach to planning and implementing measures for risk reduction.

5 Acronyms and Definitions

5.1 Acronyms

A

AAL	Average Annualized Loss
ALR	Annualized Loss Ratio
AoMI	*Areas of Mitigation Interest*

B

BCA	Benefit-Cost Analysis
BFE	Base Flood Elevation
BMP	Best Management Practices

C

CFR	Code of Federal Regulations
COG	Continuity of Government Plan
COOP	Continuity of Operations Plan
CRS	Community Rating System
CSLF	Changes Since Last FIRM

D

DHS	Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000

E

EOP	Emergency Operations Plan

F

FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FRD	Flood Risk Database
FRM	Flood Risk Map
FRR	Flood Risk Report
FY	Fiscal Year

G

GIS	Geographic Information System

H

HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program

I

IA	Individual Assistance

N

NFIA	National Flood Insurance Act
NFIP	National Flood Insurance Program
NRCS	Natural Resource Conservation Service

P

PA	Public Assistance
PDM	Pre-Disaster Mitigation

R

RFC	Repetitive Flood Claims
Risk MAP	Mapping, Assessment, and Planning

S

SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
SRL	Severe Repetitive Loss

U

USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

5.2 Definitions

0.2-percent-annual-chance flood – The flood elevation that has a 0.2-percent chance of being equaled or exceeded each year. Sometimes referred to as the 500-year flood.

1-percent-annual-chance flood – The flood elevation that has a 1-percent chance of being equaled or exceeded each year. Sometimes referred to as the 100-year flood.

Annualized Loss Ratio (ALR) – Expresses the annualized loss as a fraction of the value of the local inventory (total value/annualized loss).

Average Annualized Loss (AAL) – The estimated long-term weighted average value of losses to property in any single year in a specified geographic area.

Base Flood Elevation (BFE) – Elevation of the 1-percent-annual-chance flood. This elevation is the basis of the insurance and floodplain management requirements of the NFIP.

Berm – A small levee, typically built from earth.

Cfs – Cubic feet per second, the unit by which discharges are measured (a cubic foot of water is about 7.5 gallons).

Consequence (of flood) – The estimated damages associated with a given flood occurrence.

Crest – The peak stage or elevation reached or expected to be reached by the floodwaters of a specific flood at a given location.

Dam – An artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material, for the purpose of storage or control of water.

Design flood event – The greater of the following two flood events: (1) the base flood, affecting those areas identified as SFHAs on a community's FIRM; or (2) the flood corresponding to the area designated as a flood hazard area on a community's flood hazard map or otherwise legally designated.

Erosion – Process by which floodwaters lower the ground surface in an area by removing upper layers of soil.

Essential facilities – Facilities that, if damaged, would present an immediate threat to life, public health, and safety. As categorized in Hazus, essential facilities include hospitals, emergency operations centers, police stations, fire stations, and schools.

Flood – A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters or (2) the unusual and rapid accumulation or runoff of surface waters from any source.

Flood Insurance Rate Map (FIRM) – An official map of a community, on which FEMA has delineated both the SFHAs and the risk premium zones applicable to the community. See also Digital Flood Insurance Rate Map.

Flood Insurance Study (FIS) Report – Contains an examination, evaluation, and determination of the flood hazards of a community, and if appropriate, the corresponding water-surface elevations.

Flood risk – Probability multiplied by consequence; the degree of probability that a loss or injury may occur as a result of flooding. This is sometimes referred to as flood vulnerability.

Flood vulnerability – Probability multiplied by consequence; the degree of probability that a loss or injury may occur as a result of flooding. This is sometimes referred to as flood risk.

Flood-borne debris impact – Floodwater moving at a moderate or high velocity can carry flood-borne debris that can impact buildings and damage walls and foundations.

Floodwall – A long, narrow concrete or masonry wall built to protect land from flooding.

Floodway (regulatory) – The channel of a river or other watercourse and that portion of the adjacent floodplain that must remain unobstructed to permit passage of the base flood without cumulatively increasing the water surface elevation more than a designated height (usually 1 foot).

Floodway fringe – The portion of the SFHA that is outside of the floodway.

Freeboard – A factor of safety usually expressed in feet above a flood level for purposes of flood plain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed (44CFR§59.1).

Hazus – A GIS-based risk assessment methodology and software application created by FEMA and the National Institute of Building Sciences for analyzing potential losses from floods, hurricane winds and storm surge, and earthquakes.

High velocity flow – Typically comprised of floodwaters moving faster than 5 feet per second.

Levee – A human-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding. (44CFR§59.1)

Loss ratio – Expresses loss as a fraction of the value of the local inventory (total value/loss).

Mudflow – Mudslide (i.e., mudflow) describes a condition where there is a river, flow or inundation of liquid mud down a hillside usually as a result of a dual condition of loss of brush cover, and the subsequent accumulation of water on the ground preceded by a period of unusually heavy or sustained rain. A mudslide (i.e., mudflow) may occur as a distinct phenomenon while a landslide is in progress, and will be recognized as such by the Administrator only if the mudflow, and not the landslide, is the proximate cause of damage that occurs. (44CFR§59.1)

Probability (of flood) – The likelihood that a flood will occur in a given area.

Risk MAP – Risk Mapping, Assessment, and Planning, a FEMA strategy to work collaboratively with state, local, and tribal entities to deliver quality flood data that increases public awareness and leads to action that reduces risk to life and property.

Riverine – Of or produced by a river. Riverine floodplains have readily identifiable channels.

Special Flood Hazard Area (SFHA) – Portion of the floodplain subject to inundation by the 1-percent-annual or base flood.

Stafford Act – Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707, signed into law November 23, 1988; amended the Disaster Relief Act of 1974, PL 93-288. This Act constitutes the statutory authority for most federal disaster response activities especially as they pertain to FEMA and FEMA programs.

Stillwater –Projected elevation that flood waters would assume, referenced to National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or other datum, in the absence of waves resulting from wind or seismic effects.

Stream Flow Constrictions – A point where a human-made structure constricts the flow of a river or stream.

6 Additional Resources

ASCE 7 – National design standard issued by the American Society of Civil Engineers (ASCE), *Minimum Design Loads for Buildings and Other Structures*, which gives current requirements for dead, live, soil, flood, wind, snow, rain, ice, and earthquake loads, and their combinations, suitable for inclusion in building codes and other documents.

ASCE 24-05 – National design standard issued by the ASCE, *Flood Resistant Design and Construction*, which outlines the requirements for flood resistant design and construction of structures in flood hazard areas.

National Flood Insurance Program (NFIP), Federal Emergency Management Agency (FEMA), www.floodsmart.gov

FEMA, www.fema.gov

ASCE, 2010. *So, You Live Behind a Levee!* Reston, VA.

FEMA Publications – available at www.fema.gov

FEMA, 1985. *Manufactured Home Installation in Flood Hazard Areas*, FEMA 85. Washington, DC, September 1985.

FEMA and the American Red Cross, 1992. *Repairing Your Flooded Home*, FEMA 234/ARC 4476. Washington, DC, August 1992.

FEMA, 1996. *Addressing Your Community's Flood Problems*, FEMA 309. Washington, DC, June 1996.

FEMA, 1998. *Homeowner's Guide to Retrofitting*, FEMA 312. Washington, DC, June 1998.

FEMA, 1999. *Protecting Building Utilities from Flood Damage*, FEMA 348. Washington, DC, November 1999.

FEMA, 1999. Riverine Erosion Hazard Areas Mapping Feasibility Study. Washington, DC, September 1999.

FEMA, 2003. *Interim Guidance for State and Local Officials - Increased Cost of Compliance Coverage*, FEMA 301. Washington, DC, September 2003.

FEMA, 2000. *Above the Flood: Elevating Your Floodprone House,* FEMA 347. Washington, DC, May 2000.

FEMA, 2001. *Understanding Your Risks: Identifying Hazards and Estimating Losses*, FEMA 386-2. Washington, DC, August 2001.

FEMA, 2002a. *Getting Started: Building Support for Mitigation Planning*, FEMA 386-1. Washington, DC, September 2002.

FEMA, 2002b. *Integrating Manmade Hazards into Mitigation Planning*, FEMA 386-7. Washington, DC, September 2002.

FEMA, 2003a. *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies*, FEMA 386-3. Washington, DC, April 2003.

FEMA, 2003b. *Bringing the Plan to Life: Implementing the Hazard Mitigation Plan*, FEMA 386-4. Washington, DC, August 2003.

FEMA, 2004a. *Design Guide for Improving School Safety in Earthquakes, Floods, and High Winds*, FEMA 424. Washington, DC, January 2004.

FEMA, 2004b. *Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners*, FEMA 64. Washington, DC, April 2004.

FEMA, 2005. *Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning*, FEMA 386-6. Washington, DC, May 2005.

FEMA, 2006a. *Multi-Jurisdictional Mitigation Planning*, FEMA 386-8. Washington, DC, August 2006.

FEMA, 2006b. *Using the Hazard Mitigation Plan to Prepare Successful Mitigation Projects*, FEMA 386-9. Washington, DC, August 2008.

FEMA, 2006c. "*Designing for Flood Levels Above the BFE," Hurricane Katrina Recovery Advisory 8, Hurricane Katrina in the Gulf Coast: Building Performance Observations, Recommendations, and Technical Guidance*, FEMA 549, Appendix E. Washington, DC, July 2006.

FEMA, 2007a. *Property Acquisition Handbook for Local Communities*, FEMA 317. Washington, DC, September 2007.

FEMA, 2007b. *Public Assistance Guide*, FEMA 322. Washington, DC, June 2007.

FEMA, 2007c. *Using Benefit-Cost Review in Mitigation Planning*, FEMA 386-5. Washington, DC, May 2007.

FEMA, 2007d. *Design Guide for Improving Critical Facility Safety from Flooding and High Winds: Providing Protection to People and Buildings*, FEMA 543. Washington, DC, January 2007.

FEMA, 2007e. *Selecting Appropriate Mitigation Measures for Floodprone Structures*, FEMA 551. Washington, DC, March 2007.

FEMA, 2007f. *Design Guide for Improving Hospital Safety in Earthquakes, Floods, and High Winds: Providing Protection to People and Buildings,* FEMA 577. Washington, DC, June 2007.

FEMA, 2008. *Reducing Flood Losses Through the International Codes: Meeting the Requirements of the National Flood Insurance Program,* FEMA 9-0372, Third Edition. Washington, DC, December 2007.

7 Data Used to Develop Flood Risk Products

GIS base map information was acquired from the following sources:

- FEMA
- NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS)
- NJDEP
- NJDOT
- USDA-NRCS, USGS & EPA

Mitigation Plan
The Mitigation Plan was obtained from online resources of Camden County - http://www.Camdencountynj.org/all-hazard-mitigation-plan/

Census Information
All Census information was collected from FEMA's Hazus version 2.1 For more detailed information on the Census data and currency, see the metadata file for the Flood Risk Database.

HUC8 Boundary
HUC boundaries were provided by USDA-NRCS, USGS & EPA.

Hillshade
A grayscale image showing elevation topographic data is shown on the background of the Flood Risk Map. These data were created from LiDAR-based topographic data – the same data used in the creation of floodplain mapping of the new Preliminary floodplains.

Changes Since Last FIRM (CSLF)
CSLF are provided for the project area for the most recent map revision of the Flood Insurance Rate Map (FIRM). These data, however exclude any changes to the floodway as the latest FIRM revision did not revise the location of any floodways. Effective FIRM data was digitally captured from the National Flood Hazard Data Layer (NFHL) dated 2013/04/16. The only changes for Camden County FIRMs were to incorporate the revised Coastal Engineering analysis that did not involve any floodway revisions.

General Building Stock
General Building Stock represents the total economic inventory for a community (i.e. an estimate of the replacement dollar cost for all buildings and their content). These data come from the Census information in Hazus version 2.1. For this report, no updates or changes were made to the default General Building Stock data provided by Hazus.

Areas of Mitigation Interest
AoMI information were acquired from local community input as well as input from the State of New Jersey Department of Environmental Protection and Hazus data produced by the Federal Emergency Management Agency (FEMA).

Hazus Loss Estimations
2010 AAL loss estimates were provided by FEMA. Revised 1% losses were produced by running the 1% annual chance event depth grid of the work map coastal BFE's through Hazus Version 2.1.