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SECTION 1. INTRODUCTION

In response to the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), Sussex County and the municipalities located therein have developed this Hazard Mitigation Plan (HMP), which represents a regulatory update to the *2016 Sussex County Multi-Jurisdictional Hazard Mitigation Plan* (HMP). The DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) and is designed to improve planning for, response to, and recovery from disasters by requiring state and local entities to implement pre-disaster mitigation planning and develop HMPs. The Federal Emergency Management Agency (FEMA) has issued guidelines for HMPs. The New Jersey Office of Emergency Management (NJOEM), supports plan development for jurisdictions in New Jersey.

***Hazard Mitigation** is any sustained action taken to reduce or eliminate the long-term risk and effects that can result from specific hazards.*

*FEMA defines a **Hazard Mitigation Plan** as the documentation of a state or local government evaluation of natural hazards and the strategies to mitigate such hazards.*

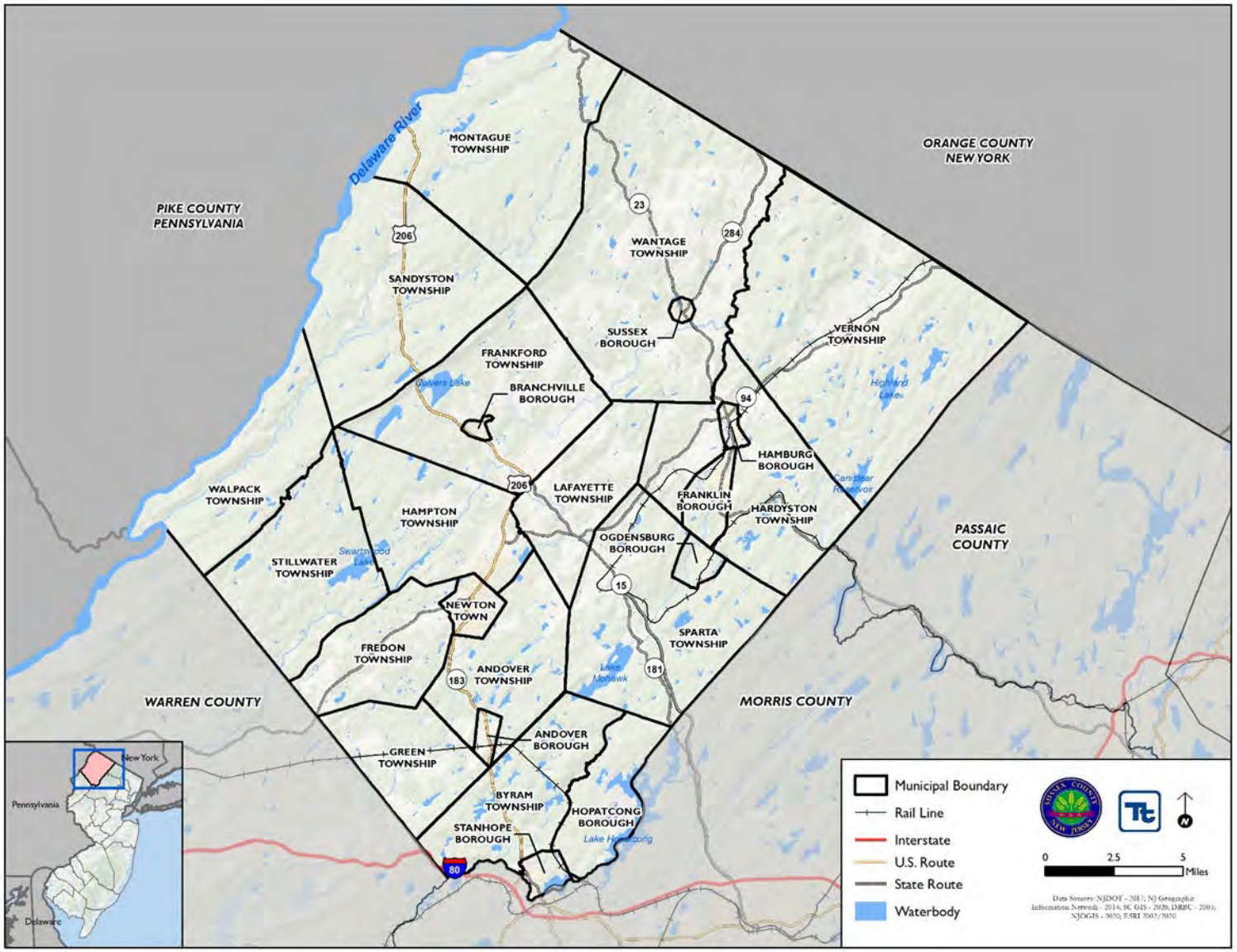
Specifically, the DMA 2000 requires that states, with support from local governmental agencies, develop and update HMPs on a five-year basis to prepare for and reduce the potential impacts of natural hazards. The DMA 2000 is intended to facilitate cooperation between state and local authorities, prompting them to work together. This enhanced planning better enables local and state governments to articulate accurate needs for mitigation, resulting in faster allocation of funding and more effective risk reduction projects.

Sussex County and all municipalities are participating in the plan update; refer to Table 1-1 and Figure 1-1.

Table 1-1. Participating Jurisdictions

Jurisdictions		
Andover Borough	Hamburg Borough	Sandyston Township
Andover Township	Hampton Township	Sparta Township
Branchville Borough	Hardyston Township	Stanhope Borough
Byram Township	Hopatcong Borough	Stillwater Township
Frankford Township	Lafayette Township	Sussex Borough
Franklin Borough	Montague Township	Vernon Township
Fredon Township	Town of Newton	Walpack Township
Green Township	Ogdensburg Borough	Wantage Township
Sussex County		

Figure 1-1. Sussex County New Jersey



1.1 DMA 2000 ORIGINS -THE STAFFORD ACT

In the early 1990s, a new federal policy regarding disasters began to evolve. Rather than reacting whenever disasters strike communities, the federal government began encouraging communities to first assess their vulnerability to various disasters and proceed to take actions to reduce or eliminate potential risks. The logic is that a disaster-resistant community can rebound from a natural disaster with less loss of property or human injury, at much lower cost, and, consequently, more quickly. Moreover, these communities minimize other costs associated with disasters, such as the time lost from productive activity by business and industries.

The DMA 2000 provides an opportunity for states, tribes, and local governments to take a new and revitalized approach to mitigation planning. The DMA 2000 amended the Stafford Act by repealing the previous mitigation planning provisions (Section 409) and replacing them with a new set of requirements (Section 322). Section 322 sets forth the requirements that communities evaluate natural hazards within their respective jurisdictions and develop an appropriate plan of action to mitigate those hazards, while emphasizing the need for state, tribal and local governments to closely coordinate mitigation planning and implementation efforts.

The amended Stafford Act requires that each local jurisdiction identify potential natural hazards to the health, safety, and well-being of its residents and identify and prioritize actions that the community can take to mitigate those hazards—before disaster strikes. To remain eligible for hazard mitigation assistance from the federal government, communities must first prepare and then maintain and update an HMP (this plan).

Responsibility for fulfilling the requirements of Section 322 of the Stafford Act and administering the FEMA Hazard Mitigation Program has been delegated to the State of New Jersey, specifically to NJOEM. FEMA also provides support through guidance, resources, and plan reviews.

1.2 BENEFITS OF MITIGATION PLANNING

Mitigation planning forms the foundation for Sussex County's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. Mitigation planning also allows Sussex County, as a whole, and participating jurisdictions to remain eligible for mitigation grant funding for mitigation projects that will reduce the impact of future disaster events. The long-term benefits of mitigation planning include the following:

National Benefit-Cost Ratio (BCR) Per Peril *BCR numbers in this study have been rounded	Beyond Code Requirements	Federally Funded
Overall Hazard Benefit-Cost Ratio	$4:1	$6:1
Riverine Flood	$5:1	$7:1
Hurricane Surge	$7:1	Too few grants
Wind	$5:1	$5:1
Earthquake	$4:1	$3:1
Wildland-Urban Interface Fire	$4:1	$3:1

Source: *FEMA 2018; Federal Insurance Mitigation Administration 2018*
Note: *Natural hazard mitigation saves $6 on average for every $1 spent on federal mitigation grants.*

- An increased understanding of hazards faced by Sussex County and their inclusive jurisdictions.
- Building more sustainable and disaster-resistant communities.
- Increasing education and awareness of hazards and their threats, as well as their risks.
- Developing implementable and achievable actions for risk reduction in the county and its jurisdictions.
- Building relationships by involving residents, organizations, and businesses.
- Identify implementation approaches that focus resources on the greatest risks and vulnerabilities.
- Financial savings through partnerships that support planning and mitigation efforts.
- Focused use of limited resources on hazards that have the biggest impact on the community.
- Reduced long-term impacts and damages to human health and structures.
- Reduced repair costs.

1.3 HAZARD MITIGATION PLAN OVERVIEW

The structure of this HMP follows the four-phase planning process recommended by FEMA and summarized in Figure 1-2. Table 1-2 summarizes the requirements outlined in the DMA 2000 Interim Final Rule and provides the section where each is addressed in this HMP. This HMP is organized in accordance with FEMA and NJOEM guidance. This plan was prepared in accordance with the following:

- FEMA Local Mitigation Planning Handbook, March 2013.
- FEMA Integrating Hazard Mitigation into Local Planning, March 1, 2013.
- FEMA Plan Integration: Linking Local Planning Efforts, July 2015.
- Local Mitigation Plan Review Guide, October 1, 2011.
- DMA 2000 (Public Law 106-390, October 30, 2000).
- 44 Code of Federal Regulations (CFR) Parts 201 and 206 (including: Feb. 26, 2002, Oct. 1, 2002, Oct. 28, 2003, and Sept. 13, 2004 Interim Final Rules).
- FEMA How-To Guide for Using HAZUS-MH-MH for Risk Assessment FEMA Document No. 433, February 2004.
- FEMA Mitigation Planning How-to Series (FEMA 386-1 through 4), 2002, available at: http://www.fema.gov/fima/planhowto.shtm.
- FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards, January 2013

Figure 1-2. Sussex County Hazard Mitigation Planning Process

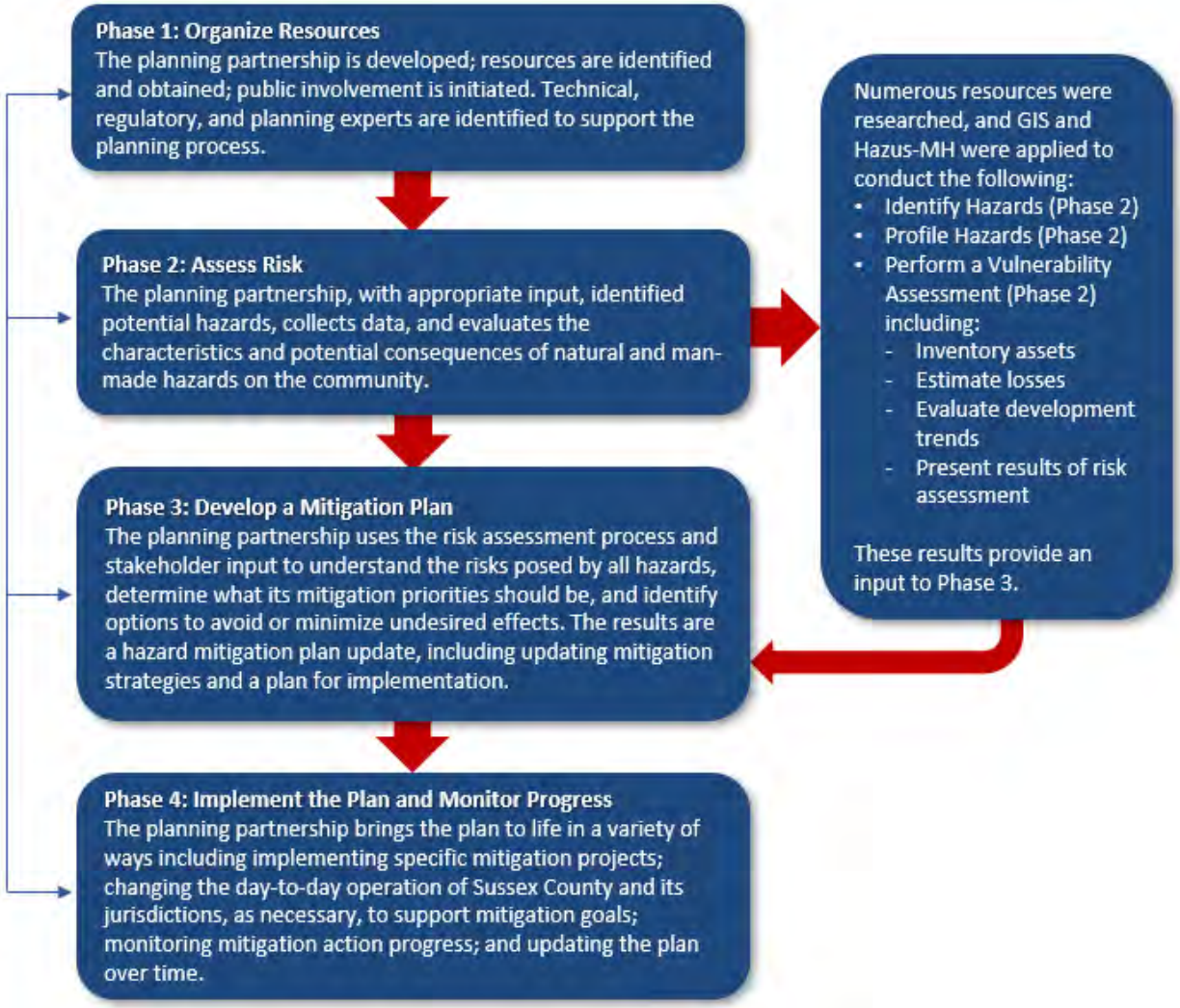


Table 1-2. FEMA Local Mitigation Plan Review Crosswalk

HMP Criteria	Primary Location in the HMP
Prerequisites	
Adoption by the Local Governing Body: §201.6(c)(5)	Section 1; Appendix A
Planning Process	
Documentation of the Planning Process: §201.6(b) and §201.6(c)(1)	Section 2; Section 8
Risk Assessment	
Identifying Hazards: §201.6(c)(2)(i)	Sections 4.1
Profiling Hazards: §201.6(c)(2)(i)	Section 4.3
Assessing Vulnerability: Overview: §201.6(c)(2)(ii)	Section 4.3
Assessing Vulnerability: Identifying Structures: §201.6(c)(2)(ii)(A)	Section 3; Section 4.2; Section 4.3; Section 9
Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B)	Section 4.3; Section 9
Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C)	Section 3; Section 4.3; Section 9
Mitigation Strategy	
Local Hazard Mitigation Goals: §201.6(c)(3)(i)	Section 6; Section 9
Identification and Analysis of Mitigation Actions: §201.6(c)(3)(ii)	Section 6; Section 9
Implementation of Mitigation Actions: §201.6(c)(3)(iii)	Section 6; Section 9
Multi-Jurisdictional Mitigation Actions: §201.6(c)(3)(iv)	Section 6; Section 9
Plan Maintenance Process	
Monitoring, Evaluating, and Updating the Plan: §201.6(c)(4)(i)	Section 7
Incorporation into Existing Planning Mechanisms: §201.6(c)(4)(ii)	Section 6; Section 7; Section 9
Continued Public Involvement: §201.6(c)(4)(iii)	Section 7

1.4 PLANNING PROCESS OVERVIEW

Sussex County and all participating municipalities intend to implement this HMP with full coordination and participation of County and local departments, organizations and groups, and relevant state and federal entities. Coordination helps to ensure that stakeholders have established communication channels and relationships necessary to support mitigation planning and mitigation actions included in Section 6 (Mitigation Strategy) and Section 9 (Jurisdictional Annexes).

During the Sussex County HMP planning process, the State of New Jersey and Sussex County were facing the COVID-19 pandemic. The COVID-19 pandemic was declared a major disaster on March 25, 2020 (DR-4488). Sussex County has been greatly impacted by the COVID-19 pandemic with 7,973 positive cases and over 250 confirmed deaths as of February 4, 2021.

The Sussex County Division of Emergency Management (DEM), Steering Committee members and the planning partners (County departments, municipalities, and stakeholders) were facing the COVID-19 pandemic concurrent with completing the update to the HMP. Sussex County and all planning partners made their best effort to work through this unprecedented time to complete the HMP update and meet FEMA and State requirements. Due to social distancing measures to reduce the spread of COVID-19, remote meetings were utilized instead of in-person meetings. This included planned public meetings throughout the planning process.

The Sussex County DEM website was updated, and social media was utilized to advertise the draft plan posting. All planning partners were notified that the draft plan was posted for public and stakeholder review, were provided social media posts/images, and were asked to distribute these notifications in their jurisdictions. Last, stakeholders that were distributed the stakeholder surveys were notified via email that the draft plan was posted for public review and comment. Refer to Section 2 (Planning Process) and Appendix D (Public and Stakeholder Engagement) for additional details on public and stakeholder outreach. Public and stakeholder comments received on the draft plan were shared with the planning partners via email and discussed with the Steering Committee. To complete the update to the draft plan prior to submission to NJOEM, teleconference meetings were held in a best effort to complete jurisdictional annexes given staffing constraints during the active pandemic.

1.5 MULTIPLE AGENCY SUPPORT FOR HAZARD MITIGATION

Primary responsibility for the development and implementation of mitigation strategies and policies lies with local governments. However, local governments are not alone; various partners and resources at the regional, state, and federal levels are available to assist communities in the development and implementation of mitigation strategies. Within New Jersey, NJOEM is the lead agency providing hazard mitigation planning assistance to local jurisdictions. NJOEM provides guidance to support mitigation planning. In addition, FEMA provides grants, tools, guidance, and training to support mitigation planning.

The Sussex County Division of Emergency Management, and the Steering Committee provided project management and oversight of the planning process. Participating jurisdictions were asked to identify a primary and alternate local point of contact (POC) to be members of the Planning Committee and lead the planning process update on behalf of the jurisdiction. At the start of the planning process, each municipality identified their National Flood Insurance Program (NFIP) Floodplain Administrator (FPA) and requested their involvement. Further, each jurisdiction was encouraged to form a 'mitigation team' comprised of representatives across departments to ensure broad participation, share the work of the update process and ensure accurate information was captured in their chapter, or annex.

Steering Committee (SC) *is comprised of County and municipal representatives that guide and lead the HMP update process on behalf of the Planning Partnership.*

Planning Committee (PC) *is comprised of representatives from each participating jurisdiction (County and municipalities).*

Planning Partnership = SC + PC

The municipal mitigation teams worked directly with the primary and alternate POCs, and the NFIP FPA and contributed to the jurisdictional annexes presented in Section 9. Together, the Steering Committee and Planning Committee are referred to as the Planning Partnership for the Sussex County HMP update. A list of Steering Committee and jurisdiction POCs is provided in Section 2 (Planning Process), while Appendices B (Meeting Documentation) and Appendix C (Participation Documentation) provide further documentation of the broader level of municipal involvement. Additional input and support for this planning effort was obtained from a range of agencies and through public and stakeholder involvement (as discussed in Section 2 and presented in Appendix D – Public and Stakeholder Outreach).

1.6 GOALS AND OBJECTIVES

The planning process included a review and update of the prior mitigation goals and objectives as a basis for the planning process and selection of appropriate mitigation actions addressing all hazards of concern. Further, the goal development process considered the mitigation goals expressed in the 2019 State of New Jersey HMP, as well as other relevant county and local planning documents, as discussed in Section 6 (Mitigation Strategy).

1.7 HAZARDS OF CONCERN

Sussex County and participating jurisdictions reviewed the hazards that caused measurable impacts based on events, losses, and information available since the development of the 2016 Sussex County HMP and the 2019 State of New Jersey HMP. A list of potential hazards of concern was reviewed by the Planning Partnership, and each was evaluated to identify the hazards of concern for the 2021 update planning process. The list was presented to each of the participating jurisdictions where they evaluated their risk and vulnerability from each hazard of concern. While the overall hazard rankings were calculated for the County and each participating jurisdiction, the specific hazard rankings displayed in each annex reflect jurisdictional input. The hazard risk rankings were used to focus and prioritize individual jurisdictional mitigation strategies.

1.8 PLAN INTEGRATION INTO OTHER PLANNING MECHANISMS

Plan integration is the process by which jurisdictions look at their existing planning framework and align efforts with the goal of building a safer, smarter, and more resilient community. It is specific to each community and depends on the vulnerability of the built environment. Community-wide plan integration supports risk reduction through various planning and development measures, both before and after a disaster. Plan integration involves a community's plans, policies, codes, and programs that guide development and the roles of people and government in implementing these capabilities. Successful integration occurs through collaboration among a diverse set of stakeholders in the community.

Effective mitigation is achieved when hazard awareness and risk management approaches and strategies are integrated into local planning mechanisms and become an integral part of public activities and decision making. Within Sussex County, there are numerous existing plans and programs that support hazard risk management and reduction, and thus, it is critical that the 2021 HMP update integrates, coordinates with, and complements those mechanisms.

Section 5 (Capability Assessment) provides a summary and description of the existing plans, programs and regulatory mechanisms at all levels of government (federal, state, county, local) that support hazard mitigation within the County. Within each jurisdictional annex in Section 9 (Jurisdictional Annexes), the County and each participating jurisdiction identified how they have integrated hazard risk management into their existing planning, regulatory and operational/administrative framework ("existing integration"), and how they intend to promote this integration ("opportunities for future integration").

A further summary of these continued efforts to develop and promote a comprehensive and holistic approach to hazard risk management and mitigation is presented in Section 9 (Jurisdictional Annexes).

1.9 IMPLEMENTATION OF PRIOR AND EXISTING LOCAL HAZARD MITIGATION PLANS

Section 9 (Jurisdictional Annexes) of the plan present the status of the mitigation projects identified in the 2016 Sussex County HMP. Numerous projects and programs have been implemented that have reduced hazard vulnerability to assets in the planning area. The County and jurisdictional annexes, as well as plan maintenance procedures in Section 7 (Plan Maintenance), were developed to encourage specific activities. Future actions include integrating hazard mitigation goals into Master Plan updates; reviewing the HMP during updates of codes, ordinances, zoning, and development; and ensuring a more thorough integration of hazard mitigation, with its related benefits into municipal operations, will be completed within the upcoming five-year planning period.

1.10 IMPLEMENTATION OF THE PLANNING PROCESS

The planning process and findings are required to be documented in local HMPs. To support the planning process in developing this HMP, Sussex County and the participating jurisdictions have accomplished the following:

- Developed a Steering Committee and countywide planning partnership with jurisdictions and stakeholders.
- Reviewed the 2016 Sussex County Hazard Mitigation Plan.
- Identified and reviewed those hazards that are of greatest concern to Sussex County and its jurisdictions (hazards of concern) to be included in the plan.
- Profiled the relevant hazards.
- Estimated the inventory at risk and potential losses associated with the relevant hazards.
- Reviewed and updated the hazard mitigation goals and objectives.
- Reviewed mitigation strategies identified in the 2016 Sussex County HMP.
- Developed new mitigation actions to address reduction of vulnerability of hazards of concern.
- Involved a wide range of stakeholders and the public in the plan process.
- Developed mitigation plan maintenance procedures to be executed after obtaining approval of the plan from NJOEM and FEMA.

As required by the DMA 2000, Sussex County and its participating jurisdictions have informed the public and provided opportunities for public comment and input. Numerous agencies and stakeholders were invited to participate in the planning process by providing input and expertise. Refer to Appendix D (Public and Stakeholder Outreach) for copies of public announcements, social media posts and other forms of public and stakeholder outreach conducted.

1.11 ADOPTION

Upon FEMA Approval Pending Adoption (APA) status of the 2021 HMP update, Sussex County and each municipality will adopt the plan by resolution of local governing body. An example resolution authorizing adoption of the 2021 Sussex County HMP may found in Appendix A. Upon receipt of the FEMA APA status, participants will adopt the plan and the resolutions saved in Appendix A. Please refer to Section 8 (Planning Partnership) for additional information on plan adoption procedures.

1.12 ORGANIZATION OF THE HAZARD MITIGATION PLAN

The Sussex County HMP update is organized as a two-volume plan. Volume I provides information on the overall planning process and hazard profiling and vulnerability assessments, which serves as a basis for understanding risk and identifying mitigation actions. As such, Volume I is intended for use as a resource for on-going mitigation analysis. Volume II provides an annex dedicated to each participating jurisdiction. Each annex summarizes the jurisdiction's legal, regulatory, and fiscal capabilities; identifies vulnerabilities to hazards; documents mitigation plan integration with other planning efforts; records status of past mitigation actions; and presents an individualized mitigation strategy. The annexes are intended to provide a useful resource for each jurisdiction for implementation of mitigation projects and future grant opportunities, as well as place for each jurisdiction to record and maintain their local aspect of the countywide plan.

Volume I of this HMP includes the following sections:

Section 1: Introduction: Overview of participants, planning process and information regarding adoption of the HMP by Sussex County and each participating jurisdiction.

Section 2: Planning Process: Description of the HMP methodology and development process; Steering Committee, Planning Committee, Planning Partnership, and stakeholder involvement efforts; and a description of how this HMP will be incorporated into existing programs.

Section 3: County Profile: Overview of Sussex County, including: (1) physical setting, (2) land use, (3) land use trends, (4) population and demographics, (5) general building stock and (6) critical facilities and lifelines.

Section 4: Risk Assessment: Documentation of the hazard identification and hazard risk ranking process, hazard profiles, and findings of the vulnerability assessment (estimates of the impact of hazard events on life, safety, health, general building stock, critical facilities, the economy).

Section 5: Capability Assessment: A summary and description of the existing plans, programs, and regulatory mechanisms at all levels of government (federal, state, county, local) that support hazard mitigation within the County.

Section 6: Mitigation Strategy: Information regarding the mitigation goals and objectives in response to priority hazards of concern and the process by which Sussex County and local mitigation strategies have been developed or updated.

Section 7: Plan Maintenance Procedures: System established to continue to monitor, evaluate, maintain, and update the HMP.

Volume II of this plan includes the following sections:

Section 8: Planning Partnership: Description of the planning partnership, their responsibilities, and description of jurisdictional annexes.

Section 9: Jurisdictional Annexes: Jurisdiction-specific annex for Sussex County and each participating jurisdiction containing their hazards of concern, hazard ranking, capability assessment, mitigation actions, action prioritization specific only to Sussex County or that jurisdiction, progress on prior mitigation activities (as applicable), and a discussion of prior local hazard mitigation plan integration into local planning processes.

Appendices include the following:

Appendix A: Plan Adoption: Resolutions from the County and each jurisdiction included as each formally adopts the HMP update.

Appendix B: Participation Documentation: Matrix to give a broad overview of who attended meetings and when input was provided to the HMP update, as well as Letters of Intent to Participate described in Section 2 (Planning Process), and additional worksheets submitted during workshops conducted throughout the planning process.

Appendix C: Meeting Documentation: Agendas, attendance sheets, meeting notes, and other documentation (as available and applicable) of planning meetings convened during the development of the plan.

Appendix D: Public and Stakeholder Outreach: Documentation of the public and stakeholder outreach effort including webpages, informational materials, public and stakeholder meetings and presentations, surveys, interactive StoryMap and other methods used to receive and incorporate public and stakeholder comment and input to the plan process.

Appendix E: Risk Assessment Supplementary Data: Expanded explanation of community lifelines and the previous hazard events from the 2016 HMP.

Appendix F: Mitigation Strategy Supplementary Data: Documentation of the broad range of actions identified during the mitigation process; types of mitigation actions; the mitigation catalog developed using jurisdiction input and potential mitigation funding sources.

Appendix G: Plan Maintenance Tools: Examples of plan review tools and templates available to support annual plan review.

Appendix H: Linkage Procedures: Procedures for non-participating local governments to "link" to the plan within the period of performance to gain eligibility for programs under the DMA 2000.

1.13 THE UPDATED PLAN – WHAT IS DIFFERENT?

Both the planning process and the 2021 HMP have been enhanced for this update. An increased effort to actively engage stakeholders and the public was a focus of the update; as well as the continued education of the Planning Partnership of mitigation and available grant funding opportunities. The mitigation strategy was updated to only contain detailed actions that are considered priority to each jurisdiction (i.e., quality not quantity). Further, the sections in the 2021 HMP have been realigned to increase the readability of the plan. The following summarizes process and plan changes that differ from the 2016 process and HMP:

- Section 2 (Planning Process) was formerly Section 3 in the 2016 HMP and now comprises the Planning Process section of the plan. Adoption information has been re-located to Section 8 (Planning Partnership) and Appendix A.
- Section 2 (Planning Process) has been updated in its entirety to summarize the planning process followed for the 2021 HMP update. In summary, the Steering Committee was expanded to include additional County Departments, two municipal representatives (Andover Township and Wantage Township), two major employers in the County (Newton Medical Center and Sussex County Community College), as well as a representative from the Upper Delaware Conservation District (former Sussex County Soil and Water Conservation District) and the Rutgers Cooperative Extension of Sussex County.
- Section 4 (Risk Assessment) has been streamlined and updated as summarized below.
    - A new hazard of concern, Infestation and Invasive Species, was added to the plan and the flood hazard was expanded to collect additional details on urban flooding (i.e., flooding outside of the floodplain).
    - The updated plan is based on new inventory data (i.e., building footprints, updated replacement cost values, critical facilities and community lifelines) and updated spatial hazard data.
    - The topic of FEMA community lifelines is included. All jurisdictions identified critical facilities considered lifelines in accordance with FEMA's community lifeline definition. In addition, the inventory expanded to include lifeline types not considered in the 2016 HMP.
    - The flood hazard was expanded to include urban flooding or flooding outside of the floodplain. The Planning Partnership identified locations of urban flooding utilizing a spatial identification tool which was developed into a spatial layer to inform the mitigation strategy.
    - The hazard ranking methodology was expanded to include adaptive capacity and climate change.
- Section 5 (Capability Assessment) and Section 9 (Jurisdictional Annexes) were subject to several changes in the capability assessment, both in Volumes I and II of the plan.
    - Section 5 (Capability Assessment) is now a stand-alone section for the capability assessment summarizing existing plans, programs and regulatory mechanisms at all levels of government (federal, state, county, local) that support hazard mitigation within the County. This information was formerly part of Section 6 (Mitigation Strategy) in the 2016 HMP.

  - Section 9 (Jurisdictional Annexes) has an expanded capability assessment to include additional planning mechanisms in New Jersey as well as information regarding plan integration in the Planning, Legal and Regulatory table.
- Section 6 (Mitigation Strategy) - A mitigation strategy workshop was conducted in November 2020 and supported by NJOEM and FEMA to focus on the development of specific problem statements based on the impacts of natural hazards in the County and communities. These problem statements provided a detailed description of the problem area, including its impacts to the municipality/jurisdiction; past damages; loss of service; etc. An effort was made to include the property/project location, adjacent streets, water bodies, and well-known structures as well as a brief description of existing conditions (topography, terrain, hydrology) of the site. These problem statements form a bridge between the hazard risk assessment which quantifies impacts to each community with the development of actionable mitigation strategies.
- The jurisdictional annexes in Section 9 have been enhanced to include the following:
  - Identification of the NFIP Floodplain Administrator as part of the hazard mitigation planning team.
  - Expanded capability assessment including the identification of additional administrative and technical capabilities and catalog of adaptive capacity for each hazard of concern for each jurisdiction.
  - Expansion of the critical facility and lifeline flood hazard exposure table to include a mitigation action, if appropriate.
  - A user-friendly presentation of the hazard ranking results.
  - A revised 2016 previous mitigation strategy status table to more clearly identify if the action is to be included in the 2021 HMP update.
  - An increased focus on actionable projects has been applied; removing actions that are capabilities and focusing on high-ranked hazards.
  - A more detailed proposed mitigation action table that now specifies the problem statement and the proposed solution (mitigation action). The more detailed mitigation strategy is also reflected in the mitigation action worksheets that also include additional details.
  - A table that summarizes the actions across the ranked hazards and their mitigation action types.
  - Individuals that contributed to the annex are specifically listed at the end of the section.
  - Mitigation action worksheets have only been developed for FEMA-eligible projects, per NJOEM guidance.
- To increase public engagement, the following efforts were made:
  - All Planning Partnership meetings were made open to the public.
  - Social media (Facebook and Twitter) was used to inform the public of meetings and to take the citizen survey.
  - An interactive StoryMap was developed to engage residents and stakeholders. The StoryMap has interactive web maps to pan around the County and view the hazard areas. It also links directly to the public and stakeholder surveys distributed.
- A user-friendly tone was used to cater to the strong desire for this plan to be understandable to the general public and not overly technical. This includes limiting the hazard profile section to brief summaries and providing an increased number of graphical summaries throughout the risk assessment.
- An enhanced mitigation strategy process was utilized to develop a robust and actional action plan.
  - A mitigation toolbox was built to assist with mitigation action identification.
  - A Strengths, Weaknesses, Obstacles and Opportunities exercise was conducted to gain a better understanding of areas of improvement and challenges faced with risk reduction.
  - Utilizing the risk assessment and capability assessment results, problem statements were drafted by each municipality and used to inform the mitigation action development.

- Actions are identified, rather than strategies. Strategies provide direction, but actions are fundable under grant programs. The identified actions are designed to meet multiple measurable objectives, so that each planning partner can measure the effectiveness of their mitigation actions.

- The plan maintenance strategy is more clearly defined to provide a roadmap for the annual monitoring of the plan.

Table 1-3 summarizes the major changes between the two plans as they relate to 44 CFR planning requirements.

Table 1-3. HMP Changes Crosswalk

44 CFR Requirement	2016 HMP	2021 Updated HMP
Requirement §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval; (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and (3) Review and incorporation, if appropriate, of existing plans, studies, reports and technical information.	The 2016 plan followed an outreach strategy utilizing multiple media developed and approved by the Steering Committee. This strategy involved the following: • Establishment of a plan informational website. • Press release • Use of public and stakeholder information surveys. Stakeholders were identified and coordinated with throughout the process. A comprehensive review of relevant plans and programs was performed by the planning team.	Building upon the success of the 2016 plan, the 2021 planning effort deployed an enhanced public engagement methodology: • Use of social media (Facebook and Twitter). • Web-deployed surveys to residents and targeted stakeholders • All meetings open to the public • Development of an interactive StoryMap to provide risk communication to residents and direct access to the citizen and stakeholder surveys. As with the 2016 plan, the 2021 planning process identified key stakeholders and coordinated with them throughout the process. The Steering Committee was expanded to include a representative of two major employers in the County, Newton Medical Center and Sussex County Community College, as well as the Upper Delaware Conservation District. A comprehensive review of relevant plans and programs was performed by the planning team.
§201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.	The 2016 plan included a comprehensive risk assessment of hazards of concern. Risk was defined as (probability x impact), where impact is the impact on people, property, and economy of the planning area. All planning partners ranked hazard risk as it pertains to their jurisdiction. The potential impacts of climate change are discussed for each hazard.	New and updated data hazard and inventory data was utilized for the 2021 plan's risk assessment update. The flood hazard was expanded to include urban flooding (or flooding outside of the floodplain). A new hazard of concern, infestation and invasive species was included. The hazard ranking methodology was expanded to include adaptive capacity and climate change. Jurisdiction-specific risk assessment results are summarized in Section 4 (Risk Assessment) and in each jurisdictional annex (Section 9).
§201.6(c)(2)(i): [The risk assessment] shall include a] description of the … location and extent of all-natural hazards	The 2016 plan presented a risk assessment of each hazard of concern. Each section included the following:	A similar format, using new and updated data, was used for the 2021 plan update. Each section of the risk

44 CFR Requirement	2016 HMP	2021 Updated HMP
that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	• Hazard profile, including maps of extent and location, previous occurrences, and probability of future events. • Climate change impacts on future probability. • Impact and vulnerability on life, health, safety, general building stock, critical facilities, and economy. • Future growth and development.	assessment includes the following along with an expanded section to discuss future changes that may impact vulnerability: • Hazard profile, including maps of extent and location, previous occurrences, and probability of future events. • Climate change impacts on future probability using the best available data for New Jersey. • Vulnerability assessment includes impact on life, safety, and health, general building stock, critical facilities/lifelines, and the economy, as well as future changes that could impact vulnerability (population, development, and climate). • The vulnerability assessment also includes changes in vulnerability since the 2016 plan.
§201.6(c)(2)(ii): [The risk assessment] shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i). This description shall include an overall summary of each hazard and its impact on the community.	Vulnerability was assessed for all hazards of concern. The HAZUS-MH-MH computer model was used for the wind, earthquake, and flood hazards. These were Level 2 analyses using County data. Site-specific data on County-identified critical facilities were entered into the HAZUS-MH model. HAZUS-MH outputs were generated for other hazards by applying an estimated damage function to an asset inventory extracted from HAZUS-MH-MH.	A robust vulnerability assessment was conducted for the 2021 plan update, using new and updated asset and hazard data. Volume 1, Section 4.3 summarizes countywide and municipal-specific vulnerability for each hazard of concern. The jurisdictional annexes (Section 9) include a summary table of impacts on each community.
§201.6(c)(2)(ii): [The risk assessment] must also address National Flood Insurance Program insured structures that have been repetitively damaged floods.	A summary of NFIP insured properties including an analysis of repetitive loss property locations was included in the plan.	Updated NFIP statistics, as well as Write-Your-Own statistics were presented in the 2021 plan update using best available data.
Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure and critical facilities located in the identified hazard area.	A complete inventory of the numbers and types of buildings exposed was generated for each hazard of concern. The Steering Committee defined "critical facilities" for the planning area, and these were inventoried by exposure. Each hazard chapter provides a discussion on future development trends.	Quantitative and qualitative analyses were conducted using the updated hazard and inventory data as presented in Section 4 (Risk Assessment). In addition, critical facilities considered community lifelines in accordance with FEMA's definition were identified.
Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) and a description of the methodology used to prepare the estimate.	Loss estimates were generated for all hazards of concern. These were generated by HAZUS-MH-MH for the wind, earthquake, and flood hazards. For the other hazards, loss estimates were generated by applying a regionally relevant damage function to the exposed inventory. In all cases, a damage function was applied to an asset inventory. The asset inventory was the same for all hazards and was generated in HAZUS-MH.	Quantitative and qualitative analyses were conducted using the updated hazard and inventory data as presented in Section 4 (Risk Assessment). Estimated potential losses are reported in both Volume 1, Section 4.3 and Volume II Section 9 for each jurisdiction.

44 CFR Requirement	2016 HMP	2021 Updated HMP
Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.	There is a summary of anticipated development in the County profile, as well as in each individual annex.	A spatial analysis using Highlands Council identified growth areas (Section 3), and potential new development identified by municipalities was conducted to determine if located in hazard areas (Section 9). These results were reported to all participants and summarized in their annexes to discuss mitigation measures. In Volume I, Section 4.3, projected changes in population and development are discussed in each hazard section and how these projected changes may lead to increased vulnerability, or plans/regulations/ordinances in place to implement mitigation to protect the development. Further, a land use analysis was conducted for the flood hazard to examine residential and non-residential classified land in the floodplain.
§201.6(c)(3):[The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.]	The 2016 plan contained goals, objectives, and actions. Each planning partner identified actions that could be implemented within their capabilities. The actions were jurisdiction-specific and strove to meet multiple objectives. All objectives met multiple goals and stand alone as components of the plan. Each planning partner completed an assessment of its regulatory, technical, and financial capabilities.	The Steering Committee reviewed and updated the goals and objectives and they were approved by the Planning Committee. A mitigation strategy workshop with associated tools and guidance on problem statement development was deployed to inform the identification of mitigation actions. Actions that were completed or no longer considered to be feasible were removed; and actions considered general or capabilities were moved to the capability and integration sections. The balance of the actions was carried over to the 2021 plan, and in some cases, new actions were added to the action plan.
Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.	The Steering Committee identified goals, and objectives targeted specifically for this hazard mitigation plan. These planning components supported the actions identified in the plan.	The Steering Committee reviewed and updated the goals and objectives and they were approved by the Planning Committee. One new goal and several new objectives were identified to align with updated County and municipal priorities.
Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.	The 2016 plan included mitigation action worksheets that evaluated alternative actions considered for the final mitigation strategy.	For the 2021 update, a mitigation catalog was developed to provide a comprehensive range of specific mitigation actions to be considered. A table with the analysis of mitigation actions by type and hazard was used in jurisdictional annexes to the plan. Mitigation action worksheets with an alternatives evaluation were prepared for FEMA-eligible projects.
Requirement: §201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National	All municipal planning partners that participate in the National Flood Insurance Program indicated their	An analysis of repetitive and severe repetitive loss properties was conducted and is summarized in

44 CFR Requirement	2016 HMP	2021 Updated HMP
Flood Insurance Program, and continued compliance with the program's requirements, as appropriate.	commitment to maintain compliance and good standing under the program.	Section 4.3.5 (Flood) and in Section 9 (Jurisdictional Annexes). Municipalities with repetitive and severe repetitive loss properties included an action to mitigate those properties.
Requirement: §201.6(c)(3)(iii): [The mitigation strategy shall describe] how the actions identified in section (c)(3)(ii) will be prioritized, implemented and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.	Each recommended action was prioritized using a revised methodology based on the STAPLEE criteria was used to prioritize projects.	A revised methodology to evaluate mitigation alternatives based on the STAPLEE with expanded criteria and using new and updated data was used for the 2021 plan update. A total of 14 criteria were used to evaluate each potential mitigation action. The evaluation included a qualitative benefits and cost review. The results of the evaluation were used to identify the actions to include in the plan and assist with the prioritization. An emphasis was placed on benefits and costs (quantified where possible and listed in the mitigation action worksheets), as well as timeline for implementation (also documented in the mitigation action worksheets for FEMA-eligible projects).
Requirement §201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.	The 2016 plan outlined a detailed maintenance strategy.	The 2021 plan details a maintenance strategy similar to that of the initial plan. It has been enhanced to provide a roadmap for the annual monitoring of the plan and a program to assist with project progress reporting. This includes the inclusion of a summary plan maintenance matrix that provides an overview of the planning partner responsibilities for monitoring, evaluation, and update of the plan.
Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.	The 2016 plan details recommendations for incorporating the plan into other planning mechanisms.	The 2021 plan details recommendations for incorporating the plan into other planning mechanisms such as the following: • Master Plan • Emergency Response Plan • Capital Improvement Programs • Municipal Code
Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.	The 2016 plan details a strategy for continuing public involvement.	The 2016 plan maintenance strategy was enhanced for the 2021 plan. In addition, the County will use a proprietary online tool to support the annual progress reporting of mitigation actions. Section 7 (Plan Maintenance) also details the continued public participation in the plan maintenance process.
Requirement §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the	Sussex County and all jurisdictions participated in the 2016 HMP.	The 2021 plan achieves DMA compliance for Sussex County and all jurisdictions. Resolutions for each partner adopting the plan can be found in Appendix A of this volume.

44 CFR Requirement	2016 HMP	2021 Updated HMP
plan (e.g., City Council, County Commissioner, Tribal Council).		

SECTION 2. PLANNING PROCESS

2021 HMP CHANGES

- The sections in the 2021 HMP were realigned to increase the readability of the plan. Section 2 (formerly Section 3 in the 2016 HMP) now comprises the Planning Process section of the plan.
- All aspects of the planning process were updated for the 2021 HMP.
- The Steering Committee was expanded to include additional County departments, municipal representatives and stakeholders including major employers.
- Public outreach was enhanced to reach a broader audience by using additional media outlets (Facebook, Twitter) and interactive online tools (StoryMap and web maps).

2.1 INTRODUCTION

This section includes a description of the planning process used to update the 2016 Sussex County HMP, including how it was prepared, who was involved in the process, and how the public was involved. To ensure that the plan meets requirements of the DMA 2000 and that the planning process would have the broad and effective support of the participating jurisdictions, regional and local stakeholders, and the public, an approach to the planning process and plan documentation was developed to achieve the following goals:

- The HMP will be multi-jurisdictional and consider natural and human-caused hazards facing Sussex County, thereby satisfying the natural hazards mitigation planning requirements specified in the DMA 2000.

- Sussex County invited all municipalities in the County to join with them in the preparation of the Sussex County HMP. The County and all municipalities are participating in the HMP as indicated in Table 2-1 below.

- The HMP shall be developed following the process outlined by the DMA 2000, FEMA regulations, and prevailing FEMA and NJOEM guidance. Following this process ensures all the requirements are met and support HMP review.

Table 2-1. Participating Sussex County Jurisdictions

Jurisdictions		
Andover Borough	Hamburg Borough	Sandyston Township
Andover Township	Hampton Township	Sparta Township
Branchville Borough	Hardyston Township	Stanhope Borough
Byram Township	Hopatcong Borough	Stillwater Township
Frankford Township	Lafayette Township	Sussex Borough
Franklin Borough	Montague Township	Vernon Township
Fredon Township	Town of Newton	Walpack Township
Green Township	Ogdensburg Borough	Wantage Township
Sussex County		

The Sussex County HMP update was written using the best available information obtained from a wide variety of sources. Throughout the HMP update process, a concerted effort was made to gather information from local

and regional agencies and staff, as well as stakeholders, federal and state agencies, and the residents of the County. The HMP Steering and Planning Committees, together called the Planning Partnership, solicited information from local agencies and individuals with specific knowledge of certain hazards and past historical events, as well as considering planning and zoning codes, ordinances, and other recent planning decisions. The hazard mitigation strategies identified in this HMP have been developed through an extensive planning process involving local, county and regional agencies, County residents and stakeholders.

This section describes the mitigation planning process, including (1) Organization of the Planning Process; (2) Stakeholder Outreach and Involvement; (3) Public Participation; (4) Integration of Existing Data, Plans, and Technical Information; (5) Integration with Existing Planning Mechanisms and Programs; and (6) Continued Public Involvement.

2.2 ORGANIZATION OF THE PLANNING PROCESS

Many parties supported the preparation of this HMP update: County officials, municipal officials, the Steering Committee, Planning Committee, stakeholders and planning consultant. This planning process does not represent the start of hazard risk management in the County; rather it is part of an ongoing process that various State, County and local agencies and individuals have continued to embrace. A summary of the past and ongoing mitigation efforts is provided in Section 6 (Mitigation Strategy), as well as in Volume II Section 9 (Jurisdictional Annexes), to give an historical perspective of the County and local activities implemented to reduce vulnerablity to hazards in the planning area.

This section of the HMP describes how the planning process was organized with the many "planning partners" involved and outlines the major activities that were conducted in the development of this HMP update.

2.2.1 ORGANIZATION OF PLANNING PARTNERSHIP

Recognizing the need to manage risk within the County, and to meet the requirements of the DMA 2000, the Sussex County DEM led the update to the 2016 Sussex County HMP. The State of New Jersey and Sussex County signed a Grantee-Subgrantee Agreement to fund the Sussex County HMP update. The period of performance for this grant is from October 1, 2018 and ending April 1, 2022. The County selected a contract planning consultant (Tetra Tech Inc. – Parsippany, NJ) to guide the County and participating jurisdictions through the HMP update process. A contract between Tetra Tech Inc. (Tetra Tech) and the County was executed in July 2020. Specifically, Tetra Tech, the "contract consultant", was tasked with:

- Assisting with the organization of a Steering Committee and Planning Committee.
- Assisting with the development and implementation of a public and stakeholder outreach program.
- Data collection.
- Facilitation and attendance at meetings (Steering Committee, Planning Committee, stakeholder, public and other).
- Review and update of the hazards of concern, and hazard profiling and risk assessment.
- Assistance with the review and update of mitigation planning goals and objectives.
- Assistance with the review of progress of past mitigation strategies.
- Assistance with the screening of mitigation actions and the identification of appropriate actions.
- Assistance with the prioritization of mitigation actions.
- Authoring of the draft and final HMP documents.

In July 2020, Sussex County DEM notified all municipalities within the County of the pending planning process and invited them to formally participate. Municipalities were provided with a copy of the Planning Partner Expectations and asked to formally notify the County of their intent to participate [via a Letter of Intent to

Participate (LOIP)] and to identify a primary and secondary planning point of contact to serve on a Planning Committee and represent the interests of their respective community. In addition, each municipal Floodplain Administrator (FPA) was identified in the LOIP and requested to actively participate in the planning process. Section 9 (Jurisdictional Annexes) and Appendix B (Participation Documentation) detail contributions provided by the FPA. All jurisdictions returned their LOIP; refer to Appendix B for copies of the returned letters.

To facilitate HMP development, with support from their contract planning consultant, Sussex County developed a Steering Committee to provide guidance and direction to the planning effort, and to ensure the resulting document will be embraced both politically and by the constituency within the planning area. All municipalities participating in the plan update authorized the Steering Committee to perform certain activities on their behalf, via the LOIP. Specifically, the Steering Committee was charged with:

Steering Committee (SC) *is comprised of County and municipal representatives and stakeholders that guide and lead the HMP update process on behalf of the Planning Partnership.*

Planning Committee (PC) *is comprised of representatives from each participating jurisdiction (County and municipal).*

Planning Partnership = SC + PC

- Providing guidance and overseeing the planning process on behalf of the general planning partnership.
- Attending and participating in Steering Committee meetings.
- Establish a timeline for completion of the plan;
- Assisting with the development and completion of certain planning elements, including:
  - Reviewing and updating the hazards of concern,
  - Developing a public and stakeholder outreach program,
  - Assuring that the data and information used in the plan update process is the best available
  - Reviewing and updating the hazard mitigation goals and objectives,
  - Identification and screening of appropriate mitigation strategies and activities; and
  - Reviewing and commenting on plan documents prior to submission to NJOEM and FEMA.
  - Ensure that the plan meets the requirements of DMA 2000 and FEMA and NJOEM guidance.

The organizational structure was successfully implemented for the 2021 HMP updated consistent with the development of the initial 2016 planning process. The Steering Committee provided guidance and leadership, oversight of the planning process, and acted as the point of contact for all participating jurisdictions and the various interest groups in the planning area. In summary, the Steering Committee was expanded to include additional County Departments, two municipal representatives from Andover Township and Wantage Township, two major employers in the County (Newton Medical Center and Sussex County Community College), as well as a representative from the Upper Delaware Conservation District (former Sussex County Soil and Water Conservation District) and the Rutgers Cooperative Extension of Sussex County.

Table 2-2. Steering and Planning Committee Members

Jurisdiction	Name	Title	Steering Committee	Planning Committee		
				Primary POC	Secondary POC	NFIP FPA
Sussex County HMP Steering Committee	Michael F. Strada	Sheriff/OEM Coordinator	X			
	Robert Haffner	Division of Emergency Management	X	X		
	Jen Van Der Wende	Division of Emergency Management	X		X	
	Scott House	Sussex County Division of Public Works	X			
	Gregory V. Poff	Sussex County Administrator, Sussex	X			

Table 2-2. Steering and Planning Committee Members

Jurisdiction	Name	Title	Steering Committee	Planning Committee		
				Primary POC	Secondary POC	NFIP FPA
		County Department of Central and Shared Services				
	William J. Koppenaal	Sussex County Engineering Department	X			
	Tom Drabic	Sussex County Division of Planning	X			
	Carol Novrit	Sussex County Health and Human Services – Division of Health	X			
	Keith Nelson	Sussex County Facilities Management	X			
	Stepher Komar	Rutgers Cooperative Extension of Sussex County	X			
	Manny Ayers	Newton Medical Center	X			
	Fred Mamay	Sussex County Community College	X			
	Sandra Meyers	Upper Delaware Conservation District (former Sussex County Soil and Water Conservation District)	X			
	George Loudis	Andover Township	X			
	Joe Konopinski	Wantage Township	X			
Planning Committee						
Sussex County	Robert Haffner	Division of Emergency Management		X		
	Jen Van Der Wende	Division of Emergency Management			X	
Andover Borough	John Hoag	Emergency Management Coordinator		X		
	Jessica Casella	Deputy Emergency Management Coordinator			X	
	Harold Pellow	Engineer				X
Andover Township	Chief Eric Danielson	Emergency Management Coordinator		X		
	Ptl. Georgios Laoudis	Deputy Coordinator			X	
	Corey Stoney	Township Engineer				X
Branchville Borough	Jeff Lewis	OEM Coordinator		X		
	Kate Leissler	Borough Clerk			X	
	Dave Simmons	Engineer				X
Byram Township	Thomas Koundry	Emergency Management Coordinator		X		X
	Ken Burke	Deputy Emergency Management Coordinator			X	
Frankford Township	Jeff Lewis	OEM Coordinator		X		
	Scott Klosterhoff	Deputy OEM Coordinator			X	
	Harold E. Pellow	Engineer				X

Table 2-2. Steering and Planning Committee Members

Jurisdiction	Name	Title	Steering Committee	Planning Committee		
				Primary POC	Secondary POC	NFIP FPA
Franklin Borough	Jim Williams	OEM Coordinator		X		
	Brian VanDenBroek	DPW Supervisor			X	
	Deborah Bonanno	Administrator				X
Fredon Township	Keith Festa	OEM Coordinator		X		X
	Glenn Deitz	Third OEM Coordinator			X	
Green Township	Mark Zschack	Municipal Clerk/Administrator		X		
	Margaret "Peg" Phillips	Mayor			X	
	Cory Stoner	Township Engineer				X
Hamburg Borough	Keith Sukennikoff	OEM Coordinator		X		
	Michael Postorino	Public Safety/Police Director			X	
	John Ruschke	Borough Engineer				X
Hampton Township	Edward Hayes	Township Emergency Management Coordinator		X		
	Jessica M. Caruso	Administrator			X	
	Harold E. Pellow	Engineer				X
Hardyston Township	William Hickerson	OEM Coordinator		X		
	Carrine Piccolo-Kaufer	Township Manager/Planner			X	
	Joseph Butto	Construction				X
Hopatcong Borough	Wade Crowley	OEM Coordinator		X		
	Ron Tappan	Administrator			X	
	William O'Connor	Construction Official				X
Lafayette Township	Richard Hughes	Committeeman/Emergency Management Coordinator		X		
	Bill Macko	Road Foreman/Roads			X	
	Debra Card	Zoning Officer/Zoning				X
Montague Township	David Coss	OEM Coordinator				
	Eileen DeFabiis	Clerk		X		
	Robert Huber	Construction Official/Plumbing Sub-Code Official			X	
Town of Newton	Dan Finkle	Deputy OEM Coordinator		X		X
	Ken Teets	OEM Coordinator			X	
	Cory Stoner	Town Engineer				X
Ogdensburg Borough	Richard Keslo	Emergency Management		X		
	George P. Hutnick	Mayor			X	X
Sandyston Township	Shane Houghtaling	Emergency Management		X		
	Amanda F. Lobban	Municipal Clerk			X	
	Robert W. Huber	Construction Official				X
Sparta Township	Neil Spidaletto	OEM Coordinator		X		
	William Close	Deputy OEM Coordinator			X	
	Stan Puszcz, P.E.	Township Engineer				X

Table 2-2. Steering and Planning Committee Members

Jurisdiction	Name	Title	Steering Committee	Planning Committee		
				Primary POC	Secondary POC	NFIP FPA
Stanhope Borough	Brian McNeilly	Borough Administrator		X		
	Eric Keller	Borough Engineer			X	
	Thomas Pershouse	Construction Official				X
Stillwater Township	Lisa Chammings	Mayor/OEM		X		
	Robert Wolfe	Deputy OEM			X	
	Arlene Fisher	Zoning Officer				X
Sussex Borough	Floyd Southard	OEM Coordinator		X		
	Robert Regavich	Deputy OEM			X	
	Kevin Kervatt	Zoning Officer				X
Vernon Township	Ken Clark	OEM Coordinator		X		
	Dan Young	Deputy OEM Coordinator/Police Chief			X	
	Robert Westenberger	Construction Official				X
Walpack Township	Victor Maglio, Mayor	Victor Maglio, Mayor		X		
	Michael Vreeland	Township Engineer, Van Cleef Engineering			X	X
Wantage Township	Joseph Konopinski	OEM Coordinator		X		
	Michael Restel	Administrator			X	
	Harold E. Pellow	Engineer				X

Notes: POC = Point of Contact; NFIP FPA=National Flood Insurance Program Floodplain Administrator

Each municipality received a copy of the "Planning Partner Expectations" which outlined the responsibilities of the participants and the agreement of the partners to authorize the Steering Committee to represent the jurisdiction in the completion of certain planning elements. Please note that while Steering Committee members are also part of the overall project Planning Partnership fulfilling these responsibilities on behalf of Sussex County. The Planning Partnership was collectively charged with the following:

- Identify municipal representatives to serve as the planning points of contact.
- Support the Steering Committee selected to oversee the development of the plan.
- Provide representation at municipal planning committee meetings.
- Provide data and information about their community as requested to update their jurisdictional annex.
- Support public outreach efforts in their community.
- Assist with the identification of stakeholders within their community that should be informed and potentially involved with the planning process.
- Review draft sections when requested and provide common and input as appropriate.
- Prepare and submit a jurisdictional annex to the Steering Committee/contract consultant.
- Identify specific mitigation actions to address each of the natural hazards posing high or medium risk to their community.
- Involve the local NFIP floodplain administrator in the planning process.
- Adopt the HMP by resolution of the governing body after FEMA conditional approval.
- Provide the Steering Committee with summary or municipal staff and volunteer labor spent on the planning process on a monthly basis.

The jurisdictional LOIP identifies the above "Planning Partner Expectations" as serving to identify those activities comprising overall participation by jurisdictions throughout the planning process. The jurisdictions in Sussex County have differing levels of capabilities and resources available to apply to the plan update process, and further have differing exposure and vulnerability to the hazard risks being considered in this plan. Sussex County's intent was to encourage participation by all-inclusive jurisdictions, and to accommodate their specific needs and limitations while still meeting the intents and purpose of plan participation. Such accommodations have included the establishment of a Steering Committee and engaging a contract consultant to assume certain elements of the planning process on behalf of the jurisdictions, and to provide additional and alternative mechanisms to meet the purposes and intent of mitigation planning.

Ultimately, jurisdictional participation is evidenced by a completed annex (chapter) of the HMP (Section 9) wherein the jurisdictions have identified their planning points of contact, evaluated their risk to the hazards of concern, identified their capabilities to effect mitigation in their community, and identified and prioritized an appropriate suite of mitigation initiatives, actions, and projects to mitigate their natural hazard risk; and eventually by the adoption of the updated plan via resolution.

Appendix B (Participation Documentation) identifies those individuals who represented their jurisdictions during this planning effort and indicates how they contributed to the planning process. This matrix is intended to give a broad overview of who attended meetings and when input was provided. All participants were encouraged to attend the Kick-off Meeting, Risk Assessment and Mitigation Action Workshop. During the planning process the planning consultant contacted each participant to offer support, explain the process, meet individually to collect updated information and to facilitate the submittal and review of critical documents.

All municipalities actively participate in the National Flood Insurance Program (NFIP) and have designated NFIP Floodplain Administrators (FPA). The FPAs were informed of the planning process, were provided the opportunity to review the plan including the jurisdictional annex and provide direct input to the plan update. Local FPAs are identified in the Points of Contact and Administrative and Technical portions of the jurisdictional annexes in Section 9 (Jurisdictional Annexes).

2.2.2 PLANNING ACTIVITIES

Members of the Planning Partnership (individually and as a whole), as well as key stakeholders, convened and/or communicated regularly to share information and participate in workshops to identify hazards; assess risks; review existing inventories of and identify new critical facilities; assist in updating and developing new mitigation goals and strategies; and provide continuity through the process to ensure that natural hazards vulnerability information and appropriate mitigation strategies were incorporated. All members of the Steering Committee and Planning Partnership had the opportunity to review the draft plan and supported interaction with other stakeholders and assisted with public involvement efforts.

A summary of committee meetings (Steering Committee and Planning Partnership) held and key milestones met during the development of the HMP update is included in Table 2-3 that also identifies which DMA 2000 requirements the activities satisfy. Documentation of meetings (e.g., agendas, sign-in sheets, meeting notes) are in Appendix C (Meeting Documentation). Table 2-3 identifies only the formal meetings held during plan development but does not reflect all planning activities conducted by individuals and groups throughout the planning process. In addition to these meetings, each jurisdiction had several individual meetings (both in person and via teleconference) to work on their jurisdictional annexes (Section 9). Further, there was a great deal of communication between the County, committee members, and the contract consultant through individual local virtual meetings, electronic mail (email), and by phone.

After completion of the HMP update, implementation and ongoing maintenance will become a function of the Planning Partnership as described in Section 7 (Plan Maintenance). The Planning Partnership is responsible for

reviewing the HMP and soliciting and considering public comment as part of the five-year mitigation plan update.

Table 2-3. Summary of Mitigation Planning Activities / Efforts

Date	DMA 2000 Requirement	Description of Activity	Participants
July 22, 2020	N/A	Pre-Kick Off Meeting with County	Sussex County DEM and Tetra Tech
August 18, 2020	1b, 2, 3a, 4a	Steering Committee Meeting #1: Review of mitigation and the 2016 HMP; Review of Steering Committee guidelines; Project schedule and data request; Hazards of concern review and updated; Stakeholders identified; Outreach was discussed (social media, website, brochures); Review of goals and objectives.	See Appendix C
August 24, 2020	1b, 2, 3, 4	Sussex Rural Electric Coop: A stakeholder meeting was held with Sussex Rural Electric Coop to discuss capabilities, vulnerabilities and mitigation actions.	Sussex Rural Electric Coop and Tetra Tech
August 2020	1b, 2	Sussex County distributed stakeholder surveys to collect vulnerabilities, capabilities and mitigation actions from academia, emergency services, transportation sector, utilities, hospital and health care, business/commerce and social services.	See Section 2.3 (Stakeholder Outreach and Involvement) and Appendix D
September 2019	2	Multi-lingual (English and Spanish) social media posts released (Facebook and Twitter) regarding the commencement of the HMP update and the Sussex County dedicated webpage for mitigation was updated with including announcing the first public kickoff meeting in October. The HMP project website also contains links to the HMP brochure and citizen and stakeholder surveys.	See Appendix D
September 10, 2020	1b, 2, 3a-c, 3e, 4a, 4b	Planning Partnership Kickoff Meeting – *open to the public:* Importance of mitigation and HMP; Participation Requirements; Review of Steering Committee decisions on August 18; Hazards of concern identification and previous events exercise.	See Appendix C
October 22, 2020	1b, 2, 3a, 4a	Steering Committee #2: Project status update; Linkage procedures; Hazard ranking methodology; County hazard ranking; Strengths, Weaknesses, Obstacles and Opportunities (SWOO) exercise.	See Appendix C
October 28, 2020	1b, 2, 3a, 3b, 3c, 3d, 3e	Planning Partnership Risk Assessment Meeting – *open to the public*. Presentation of draft risk assessment results, hazard ranking exercise, SWOO exercise for high-ranked hazards, introduction to development of problem statements.	See Appendix C
November 12, 2020	1b, 2, 4a, 4b, 4c	Planning Partnership Mitigation Strategy Workshop – *open to the public* Review of FEMA and State mitigation strategy requirements; Problem statement development; Mitigation resources distributed including mitigation catalog and critical facility/lifeline risk assessment results; Review of Mitigation Action Worksheets.	See Appendix C
September 2020 – March 2021	2, 3, 4	Individual annex support meetings via in-person or virtual (teleconference)	See Appendix C
March 2021	2, 3, 4	Steering Committee reviewed the draft HMP and considered stakeholder comments received to date	Steering Committee; see Appendix C

Date	DMA 2000 Requirement	Description of Activity	Participants
March 29, 2021	2, 3, 4, 5	Steering Committee meeting to review and discuss comments on the draft HMP prior to public review.	Steering Committee; see Appendix C
April 2021	2	Draft HMP posted to public project website All plan participants were notified and asked to assist with the public outreach including social media. Letters to neighboring Counties and stakeholders, were distributed,	Public and Stakeholders
Anticipated May 2021	4b, 4c, 5b	All jurisdictions consider public and stakeholder comments received; update the plan accordingly	All plan participants
Anticipated May 2021	2	HMP submitted to NJOEM and FEMA Region II	NJOEM, FEMA Region II
Anticipated Fall 2021	1a	Plan adoption by resolution by the governing bodies of all participating municipalities	All plan participants

Note: Each number in column 2 identifies specific DMA 2000 requirements, as follows:

1a – Prerequisite – Adoption by the Local Governing Body
1b – Public Participation
2 – Planning Process – Documentation of the Planning Process
3a – Risk Assessment – Identifying Hazards
3b – Risk Assessment – Profiling Hazard Events
3c – Risk Assessment – Assessing Vulnerability: Identifying Assets
3d – Risk Assessment – Assessing Vulnerability: Estimating Potential Losses
3e – Risk Assessment – Assessing Vulnerability: Analyzing Development Trends
4a – Mitigation Strategy – Local Hazard Mitigation Goals
4b – Mitigation Strategy – Identification and Analysis of Mitigation Measures
4c – Mitigation Strategy – Implementation of Mitigation Measures
5a – Plan Maintenance Procedures – Monitoring, Evaluating, and Updating the Plan
5b – Plan Maintenance Procedures – Implementation through Existing Programs
5c – Plan Maintenance Procedures – Continued Public Involvement

2.3 STAKEHOLDER OUTREACH AND INVOLVEMENT

Stakeholders are the individuals, agencies, and jurisdictions that have a vested interest in the recommendations of the HMP, including all planning partners. Diligent efforts were made to assure broad regional, county and local representation in this planning process. To that end, a comprehensive list of stakeholders was developed with the support of the Planning Partnership. Stakeholder outreach was performed early on, and continually throughout the planning process. This HMP update includes information and input provided by these stakeholders where appropriate, as identified in the references.

This subsection discusses the various stakeholders that were invited to participate in the development of this HMP update, and how these stakeholders participated and contributed. This summary listing cannot possibly represent the total of stakeholders that were aware of and/or contributed to this HMP update, as outreach efforts were being made, both formally and informally, throughout the process by the many planning partners involved in the effort, and documentation of all such efforts is impossible. Instead, this summary is intended to demonstrate the scope and breadth of the stakeholder outreach efforts made during the plan update process:

- All Planning Partnership meetings were open to the public and advertised via the Sussex County's website and social media platforms.
- Municipalities distributed the HMP brochure digitally, citizen and stakeholder surveys and link to the County HMP webpage, where feasible.
- Distributed a stakeholder survey via social media, Sussex County's mitigation webpage and through the StoryMap to provide input regarding vulnerabilities, capabilities and mitigation projects.
- Posted draft plan on the Sussex County OEM mitigation website and advertised using social media.

- Distributed letters to regional stakeholders and neighboring counties to participate in meetings, contribute to the development of the HMP, and review the draft HMP.

Federal Agencies

Please see Appendix B (Participation Documentation) for further details regarding federal agency participation. All responses to the stakeholder surveys may be found in Appendix D (Public and Stakeholder Outreach).

FEMA Region II: Provided updated planning guidance; provided summary and detailed NFIP data for planning area; conducted plan review.

Information regarding hazard identification and the risk assessment for this plan update were requested and received or incorporated by reference from the following agencies and organizations:

- National Climatic Data Center (NCDC)
- National Hurricane Center (NHC)
- National Oceanic and Atmospheric Administration (NOAA)
- National Weather Service (NWS)
- Storm Prediction Center (SPC)
- U.S. Army Corps of Engineers (USACE)
- U.S. Census Bureau
- U.S. Department of Agriculture (USDA)
- U.S. Department of Health and Human Services
- U.S. Environmental Protection Agency (USEPA)
- U.S. Geological Survey (USGS)

State Agencies

New Jersey State Police Office of Emergency Management (NJOEM): Administered the planning grant; provided updated planning guidance; attended the September 2020 Kickoff Meeting, October 2020 Risk Assessment Meeting, and November 2021 Mitigation Strategy Workshop; worked with local jurisdictions in developing their updated mitigation strategy; consulted with individual municipalities interested in applying for FEMA Hazard Mitigation Assistance grants; and provided review of the draft HMP update.

New Jersey Department of Environmental Protection (NJDEP): The NJDEP was requested information regarding dams in Sussex County; provided the Community Assistance Visit dates and associated NFIP information for all jurisdictions. In addition, the Bureau of Dam Safety, State Park Service, and Bureau of Flood Engineering were asked to take the stakeholder survey. The Bureau of Dam Safety attended the September 2020 Kickoff Meeting and October 2020 Risk Assessment Meeting.

New Jersey Department of Transportation (NJDOT): The NJDOT Office of Emergency Management attended the September 2020 Kickoff Meeting and was asked to take the stakeholder survey.

Please see Appendix B (Participation Documentation) for further details regarding state agency participation. All responses to the surveys may be found in Appendix D (Public and Stakeholder Outreach).

County and Regional Agencies and Commissions and Non-Profits

County

Several County departments were represented on the Steering Committee, and additional departments and divisions actively involved in the HMP update planning process; refer to Table 2-2 and Appendices C and D. As previously noted, Steering Committee members were invited to all meetings, were provided updates via email communication and invited to review the draft HMP. In addition, the following County employees were emailed an announcement regarding the HMP commencement and invited to participate in the citizen survey; refer to Appendix D (Public and Stakeholder Participation).

- Sussex County Sheriff's Office
- Sussex County Division of Emergency Management
- Sussex County Division of Public Works
- Sussex County Administrator
- Sussex County Department of Central and Shared Services
- Sussex County Engineering Department
- Sussex County Division of Planning
- Sussex County Division of Planning and Economic Development
- Sussex County Health and Human Services – Division of Health
- Sussex County Facilities Management

Regional and Local Stakeholders

All Planning Partnership meetings were announced on the Sussex County HMP project website and posted on social media to invite residents and stakeholders including the following sectors as outlined below. In addition, the County and municipal representatives emailed regional and local stakeholders requesting their participation in stakeholder sector-specific surveys to provide input on vulnerable assets, capabilities, and current/potential future mitigation projects; and invited to provide input on the draft HMP. Refer to Appendix C (Participation Documentation) for further details regarding regional and local stakeholder agency attendance at meetings and Appendix D (Public and Stakeholder Outreach) for additional details on the public and stakeholder outreach, including responses received to the surveys.

Emergency Services

Numerous Municipal OEM Coordinators participated as points of contact for municipalities and contributed to the plan. Emergency services stakeholders were contacted directly by Sussex County and participating municipalities to take a stakeholder survey which included questions regarding capabilities, vulnerabilities and mitigation projects/actions. Overall, two responses were received on this survey as summarized in Appendix D. The surveys were distributed to the following:

- Municipal OEM Coordinators
- All EMS agencies in Sussex County
- Sussex County Fire Coordinator
- Sussex County EMS Coordinator
- Sussex County Sheriff's Department

Health and Social Services

The following hospital, health care and social service providers were contacted directly by Sussex County and participating municipalities to take a stakeholder survey which included questions regarding capabilities,

vulnerabilities and mitigation projects/actions. In addition, municipalities were asked to distribute these custom surveys to establishments in their jurisdictions.

- American Red Cross
- Newton Medical Hospital – member of the Steering Committee

Utilities

The following stakeholders were contacted directly and invited to the September 2020 Kickoff Meeting and October 2020 Risk Assessment Meeting. In addition, they were emailed directly and invited to take a stakeholder survey which included questions regarding mitigation capabilities, vulnerabilities and mitigation projects/actions. One survey response was received as of February 8, 2021.

- Sussex Rural Electric Coop
- PSE&G
- JCP&L – attended the September 2020 Kickoff Meeting
- New Jersey American Water
- Sussex County Municipal Utilities Authority
- Musconetcong Sewer Authority District
- Hardyston Township Municipal Utilities Authority
- Town of Newton Wastewater Utility
- Aqua NJ – Wallkill (owns Wallkill Sewer Company)
- Andover Utility Company Inc.
- Montague Sewer Company (owned by Utilities Inc.)
- Vernon Township Municipal Utilities Authority

Business Commerce

The Sussex County Chamber of Commerce and Sussex County Tourism were invited to the September 2020 Kickoff meeting and October 2020 Risk Assessment meeting. In addition, they were contacted via email to participate in the stakeholder survey which included questions regarding mitigation capabilities, vulnerabilities and mitigation projects/actions. In addition, municipal representatives on the Planning Partnership were asked to distribute this survey to their local chambers of commerce and large employers. No responses were received as of February 8, 2021.

Transportation

Representatives at the following transportation and public works agencies were emailed directly and invited to the September 2020 Kickoff Meeting and October 2020 Risk Assessment Meeting. In addition, these stakeholders were invited to participate in the stakeholder survey which included questions regarding mitigation capabilities, vulnerabilities and mitigation projects/actions. In addition, municipalities were asked to distribute this survey to their local public works departments. No responses were received as of February 8, 2021.

- New Jersey Transit
- North Jersey Transportation Planning Authority
- Skylands Ride Public Transportation

Academia

The following academic institutions were invited to the September 2020 Kickoff Meeting and October 2020 Risk Assessment Meeting. In addition, they were asked via email to take a stakeholder survey which included questions regarding mitigation capabilities, vulnerabilities and mitigation projects/actions. In addition, all

municipalities were asked to distribute this survey to their local school districts. No responses were received as of February 8, 2021.

- Rutgers University
  - Office of the State Climatologist
  - School of Planning and Public Policy
  - Rutgers Cooperative Extension Water Resources Program
- Sussex County Community College (member of the Steering Committee)

Regional Agencies and Neighboring Counties

The following regional agencies and neighboring counties were invited to attend the September 2020 Kickoff Meeting and October 2020 Risk Assessment Meeting. In addition, they were invited via email to take a stakeholder survey which included questions regarding mitigation capabilities, vulnerabilities and mitigation projects/actions. In addition, Sussex County sent letters to each of the neighboring County OEM departments as well as the County Administrators. Additional participation is noted below:

- New Jersey Highlands Council – participated in the Stakeholder survey
- Sustainable Jersey
- New Jersey Future
- Upper Delaware Conservation District – member of the Steering Committee
- Morris County, New Jersey
- Warren County, New Jersey
- Passaic County, New Jersey
- Pike County, Pennsylvania – the Pike County OEM and Planning Departments attended the September 2020 Kickoff Meeting and October Risk Assessment Meeting, respectively
- Monroe County, Pennsylvania
- Orange County, New York
- Sullivan County, New York

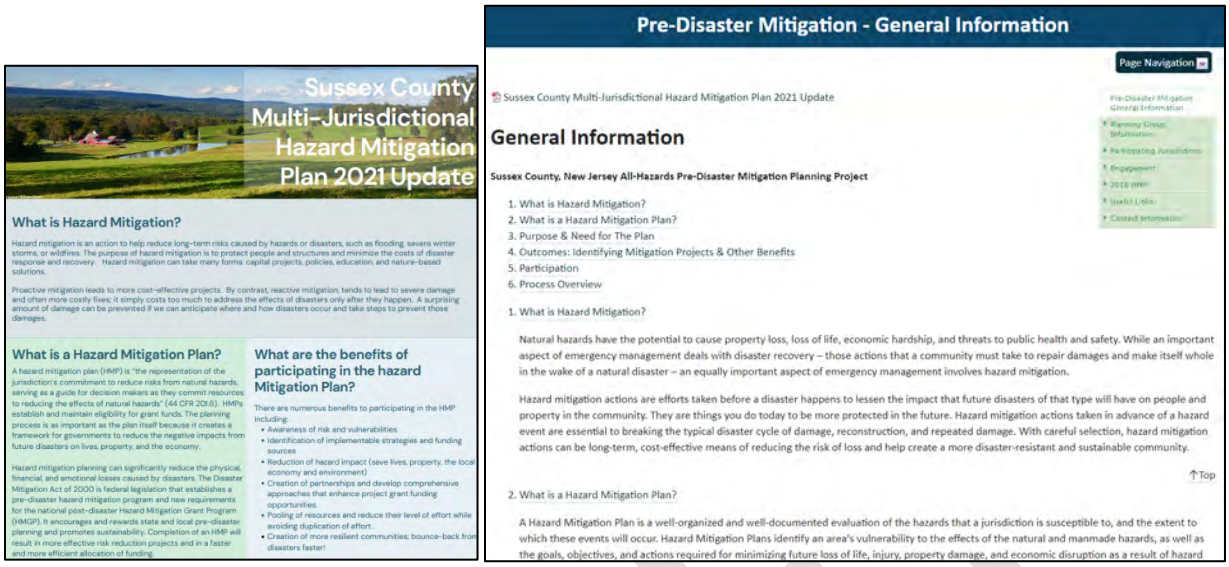
2.4 PUBLIC PARTICIPATION - CITIZEN INVOLVEMENT

In order to facilitate better coordination and communication between the Planning Partnership and citizens and to involve the public in the planning process, it was determined that meeting dates/locations will be made available to the public via the Sussex County DEM website dedicated to the HMP update and social media; and the draft HMP available on the Sussex County website. The participating partners also feel that community input on the HMP will increase the likelihood of hazard mitigation becoming one of the standard considerations in the evolution and growth of the County.

The Planning Partnership has made the following efforts toward public participation in the development and review of the HMP:

- The Sussex County DEM created a dedicated website for this project. The website went live in September 2020 and was continuously updated throughout the planning process. The public website contains a project overview, meeting announcements, a brochure, draft documents for review and comment, and a link to the citizens and stakeholder surveys; refer to Figure 2-1 for a screenshot of the public website and brochure.

Figure 2-1. Screenshots of the Brochure and Website for the 2021 HMP Update



- All hazard mitigation Planning Partnership meetings were open to the public and advertised on the Sussex County HMP website and through social media (Facebook and Twitter). The citizen survey was available through the website, social media and StoryMap as well; refer to Figure 2-2 for an example post. Additional examples of County and municipal outreach are presented in Appendix D.

- The Sussex County issued an official News Release that announced the commencement of the HMP update and invited the public to attend the kickoff meeting and take the citizen survey. This News Release was also posted on the County website; refer to Appendix D for a copy.

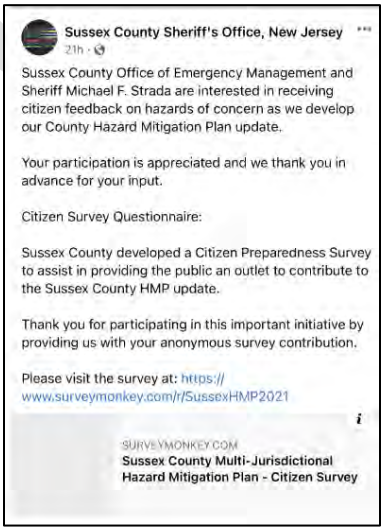


Figure 2-2. Example Social Media Post to Advertise the Resident Survey

- An on-line natural hazards preparedness citizen survey was developed to gauge household preparedness that may impact the County and to assess the level of knowledge of tools and techniques to assist in reducing risk and loss of those hazards. The questionnaire asked quantifiable questions about citizen perception of risk, knowledge of mitigation, and support of community programs. The questionnaire also asked several demographic questions to help analyze trends. The questionnaire has been available on the public website since August 2020, and further advertised on additional County and municipal websites and on printed materials. In addition, residents were notified of its availability via social media (Facebook and Twitter) with a direct link from the StoryMap. Reponses were collected and shared with the Planning Partnership at the October 2020 and November 2020 meetings to inform problem statement development and mitigation action development. As of February 8, 2021, 243 residents responded to the survey. Appendix D summarizes public input received through the website, the online survey, and other sources.

- In October 2020, a StoryMap was released on the County's mitigation webpage and through social media (Facebook and Twitter) to provide additional information regarding the Sussex County HMP update and serve as another source of risk communication to residents. The Story Map summarizes the planning

process, provides links to the citizen and stakeholder surveys and had individual pages for each hazard of concern. The pages for each hazard of concern provide a brief overview of each hazard and hyperlinks to additional resources, when available. For the spatial hazards, residents can dynamically pan a map to view the hazard area relevant to areas in the County.

- A hazard mitigation planning brochure was developed to inform the public of the planning process, provide local contact information, and encourage the public to review the plan and provide input. This brochure was provided to all plan participants in electronic format to distribute in their offices and communities; refer to Figure 2-1 and Appendix D.

- Sussex County residents were provided an opportunity to comment on the draft HMP before submittal to FEMA. The HMP was posted on the HMP public website in March 2021 for review. All jurisdictions were requested to assist with advertising the plan was posted via their websites and social media. Public comments received through April 2021 were distributed to Planning Partnership for their consideration.

Additional examples of public outreach efforts by the Planning Partnership, and results of surveys distributed, are presented in Appendix D (Public and Stakeholder Outreach Documentation).

2.5 INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

The Sussex County HMP strives to use the best available technical information, plans, studies and reports throughout the plan process to support hazard profiling; risk and vulnerability assessment; review and evaluation of mitigation capabilities; and the identification, development and prioritization of county and local mitigation strategies.

The asset and inventory data used for the risk and vulnerability assessments is presented in the County Profile (Section 3). Details of the source of this data, along with technical information on how the data was used to develop the risk and vulnerability assessment, is presented in the Risk Assessment, specifically in Section 4.2 Methodology and Tools, as well as throughout the hazard profiles in Section 4.3 (Hazard Profiles). Further, the source of technical data and information used may be found within the References section.

Plans, reports, and other technical information were identified and provided directly by the County, participating jurisdictions, and numerous stakeholders involved in the planning effort, as well as through independent research by the planning consultant. The County and participating jurisdictions were tasked with updating the inventory of their Planning and Regulatory capabilities in Section 9 (Jurisdictional Annexes) and providing relevant planning and regulatory documents, as applicable. Relevant documents, including plans, reports, and ordinances were reviewed to identify the following:

- Existing County and municipal capabilities.
- Needs and opportunities to develop or enhance capabilities, which may be identified within the County or local mitigation strategies.
- Mitigation-related goals or objectives considered in the review and update of the overall Goals and Objectives in Section 6 (Mitigation Strategy).
- Proposed, in-progress, or potential mitigation projects, actions, and initiatives to be incorporated into the updated County and local mitigation strategies.

The following local regulations, codes, ordinances, and plans were reviewed during this process to develop mitigation planning goals, objectives, and strategies that are consistent across local and regional planning and regulatory mechanisms to accomplish complementary and mutually supportive strategies:

- Master Plans
- Building Codes
- Zoning and Subdivision Ordinances
- NFIP Flood Damage Prevention Ordinances
- Site Plan Requirements
- Stormwater Management Plans
- Emergency Management and Response Plans
- Land Use and Open Space Plans
- Capital Plans
- New Jersey State Hazard Mitigation Plan (2019)

2.6 INTEGRATION WITH EXISTING PLANNING MECHANISMS AND PROGRAMS

Effective mitigation is achieved when hazard awareness and risk management approaches and strategies become an integral part of public activities and decision-making. Within the County there are many existing plans and programs that support hazard risk management, and thus it is critical that this hazard mitigation plan integrate and coordinate with, and complement, those mechanisms.

Section 5 (Capability Assessment) provides a summary and description of the existing plans, programs, and regulatory mechanisms at all levels of government (federal, state, county, and local) that support hazard mitigation within the County. Within each jurisdictional annex in Section 9, the County and each participating jurisdiction identified how they integrated hazard risk management into their existing planning, regulatory, and operational/administrative framework (*integration capabilities*) and how they intend to promote this integration (*integration actions*).

A further summary of these continued efforts to develop and promote a comprehensive and holistic approach to hazard risk management and mitigation is presented in Section 7 (Plan Maintenance).

2.7 CONTINUED PUBLIC INVOLVEMENT

Sussex County and participating jurisdictions are committed to the continued involvement of the public in the hazard mitigation process. This HMP update will be made available for review on the HMP public website. Each jurisdiction's elected official shall be responsible for receiving, tracking, and filing public comments regarding this HMP update.

A notice regarding annual updates of the plan and the location of plan copies will be publicized annually after the annual plan evaluation meeting (refer to Section 7 – Plan Maintenance) and posted on the public website at https://www.sussex.nj.us/cn/webpage.cfm?TPID=11091

The public will be provided an opportunity to comment on the HMP update as a part of the annual mitigation planning evaluation process and the next five-year mitigation plan update. The HMP Coordinator (currently Director Robert Haffner, Division of Emergency Management) is responsible for coordinating the plan evaluation portion of the meeting, soliciting feedback, collecting and reviewing the comments, and ensuring their incorporation in the 5-year plan update as appropriate; however, members of the Planning Partnership will assist the HMP Coordinator. Additional meetings may also be held as deemed necessary. The purpose of these meetings would be to provide the public an opportunity to express concerns, opinions, and ideas about the HMP.

Further details regarding continued public involvement are provided in Section 7 (Plan Maintenance).

After completion of this HMP update, implementation and ongoing maintenance will continue to be a function of the Planning Partnership. The Planning Partnership will review the plan and accept public comment as part of an annual review and as part of five-year mitigation plan updates.

A notice regarding annual updates of the plan will be publicized annually after the HMP Committee's annual evaluation and posted on the public web site.

Director Robert Haffner has been identified as the ongoing County HMP Coordinator (see Section 7), and is responsible for receiving, tracking, and filing public comments regarding this HMP update. Contact information is:

Mailing Address:	Sussex County Division of Emergency Management 135 Morris Turnpike, Newton, NJ 07860
Contact Name:	Director Robert Haffner
Email Address:	rhaffner@sussexcountysheriff.com

SECTION 3. COUNTY PROFILE

This profile describes the general information of Sussex County (physical setting, population and demographics, general building stock, and land use and population trends) and critical facilities located in Sussex County. In Section 4 (Risk Assessment), specific profile information is presented and analyzed to develop an understanding of the study area, including the economic, structural, and population assets at risk and the particular concerns that may be present related to hazards analyzed (for example, a high percentage of vulnerable persons in an area).

2021 HMP CHANGES

- The "County Profile" is now located in Section 3; previously located in Section 4. It contains updated information regarding the County's physical setting, population and demographics and trends, general building stock, land use and trends, potential new development and critical facilities. This includes U.S. Census American Community Survey (ACS) 2018 data and additional information regarding the New Jersey Highlands Region in the Development Trends/Future Development subsection.
- The critical facility inventory was expanded to include community lifelines using FEMA's lifeline definition.

3.1 GENERAL INFORMATION

Sussex County is the northern-most county in the State of New Jersey. It is bordered to the north by New York State, to the south by Warren and Morris Counties, to the east by Passaic County and to the west by the Delaware River and the Commonwealth of Pennsylvania. The County is made up of 24 jurisdictions that span approximately 536 square miles. Historically, Sussex County has been a scenic, rural county with small municipalities, plenty of open space, and agriculture. Figure 3-1 illustrates Sussex County, its municipalities, and the surrounding jurisdictions.

3.1.1 PHYSICAL SETTING

This section presents the physical setting of Sussex County, including hydrography and hydrology, topography and geology, climate, and land use/land cover.

Hydrography and Hydrology

Numerous ponds, lakes, creeks, and rivers make up the waterscape of Sussex County. Most of the lakes in the County are found generally in two areas: along the eastern slope of the Kittatinny Ridge and in the Highlands province of eastern Sussex County. These areas are where topography and geology support the development of lakes. Most of the lakes serve recreational purposes and were developed as vacation areas in the past. The most prominent lakes in Sussex County include Lake Hopatcong (largest in New Jersey), Culvers Lake, Lake Owassa, Big Swartswood Lake, Lake Mohawk, Highland Lake, and Wawayanda Lake. Rivers and streams in Sussex County include: Delaware River, Wallkill River, Flat Brook, Paulins Kill, Pequest River, Musconetcong River, Clove Brook, Mill Brook, Kymer Brook, Lubbers Run, Papakating Creek, Pochuck Creek, Waywayanda Creek, Black Creek, Pequannock River, Pacack Brook, Russia Brook, and Rockaway River. Figure 3-1 illustrates the location of the waterbodies in the County.

Delaware River Basin

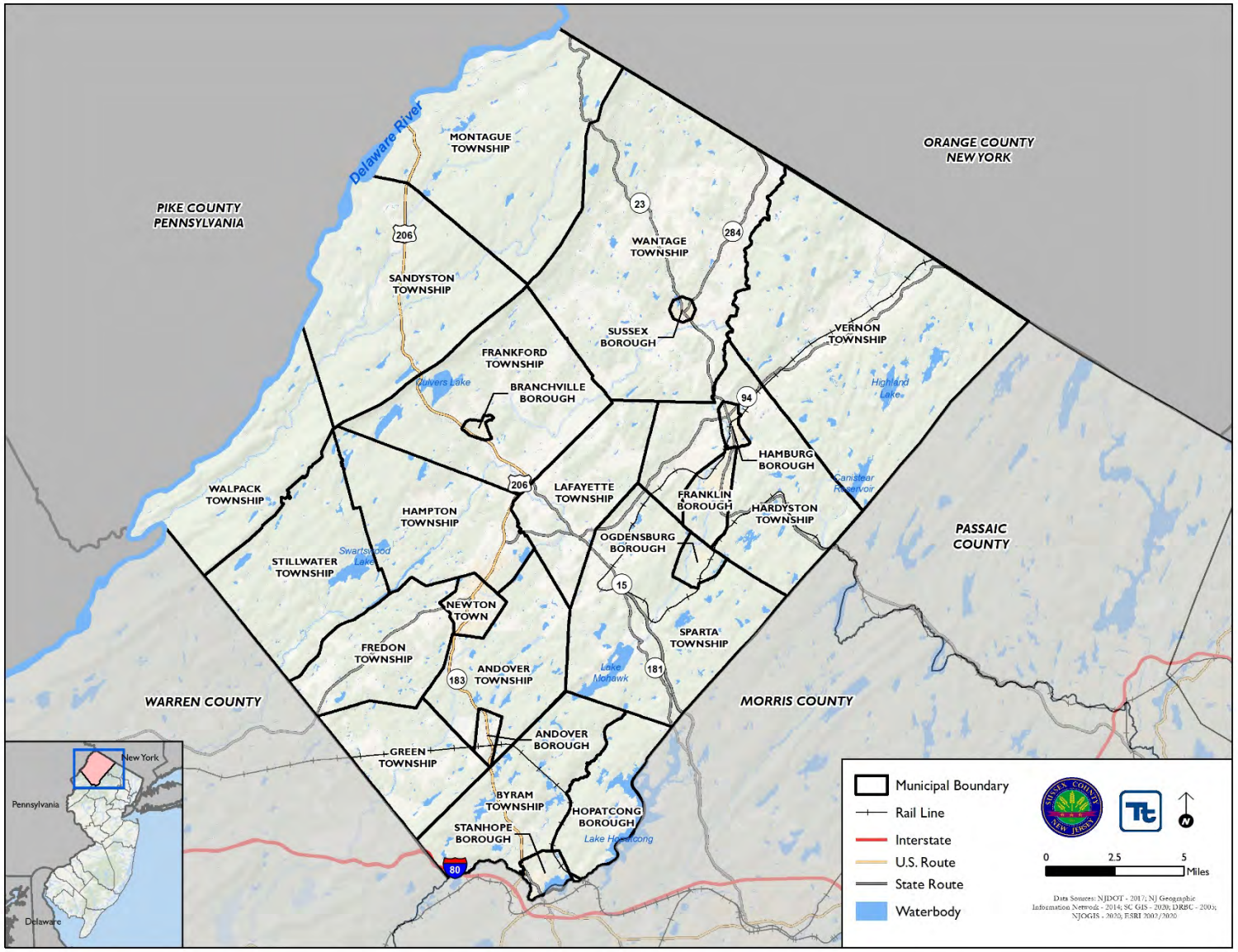
The Delaware River is the longest un-dammed river in the United States east of the Mississippi River. It runs and drains through parts of Pennsylvania, New Jersey, New York, and Delaware. The Delaware River extends

330 miles from the confluence of its east and west branches at Hancock, New York to the mouth of the Delaware Bay where it meets the Atlantic Ocean (Watershed Alliance 2019).

Overall, the Delaware River is fed by over 2,000 tributaries and spans approximately 13,600 square miles, including the 782 square mile Delaware Bay. Its hydrographic regions are divided between two main physiographic areas—the Appalachian Highlands and the Atlantic Coastal Plain. The Sussex County portion of the Delaware River falls in the Appalachian Highlands region, which consists primarily of consolidated sedimentary rock. The area's sub-region, known as Ridge and Valley, consists of mountain ridges in the north and rolling hills in the south.

Approximately 8.3 million people live in the Delaware River Basin, of which 23-percent reside in the State of New Jersey. The population in the Delaware River Basin is expected to increase 8.4-percent by 2030 and a portion of this increase is expected in Sussex County (Delaware River Basin Commission 2019).

Figure 3-1. Overview Map Sussex County, New Jersey



Watersheds

A watershed is the area of land that drains into a body of water such as a river, lake, stream, or bay. It is separated from other systems by high points in the area such as hills or slopes. It includes not only the waterway itself but also the entire land area that drains to it. Drainage basins generally refer to large watersheds that encompass the watersheds of many smaller rivers and streams.

In New Jersey, the state is divided into 20 Watershed Management Areas (WMA), which are made up of smaller watersheds. Sussex County is located in four of the 20 WMAs that are discussed further below: Upper Delaware (WMA 1); Wallkill (WMA 2); Pompton, Pequannock, Wanaque, Ramapo (WMA 3) and Upper Passaic, Whippany and Rockaway (WMA 6). Figure 3-1 illustrates the watersheds of Sussex County.

Watershed Management Area 1: Upper Delaware

WMA 1 includes portions of Sussex, Morris, and Hunterdon Counties and all of Warren County. This area is also known as the Upper Delaware River Watershed and encompasses 746 square miles in the northwest corner of New Jersey. Within WMA 1, there are six major drainage basins: Delaware River, Flat Brook, Paulins Kill, Pequest River, Lopatcong and Pohatcong River Drainage, and the Musconetcong River (NJDEP 2012).

In Sussex County, WMA 1 is located in the western and southern sections of the county and encompasses greater than half of the county's land area. Principal waterways in Sussex County's portion of WMA 1 include: Flat Book, Paulins Kill, Pequest River, and a short stretch of the Musconectong River (NJDEP 2012).

Watershed Management Area 2: Wallkill River Watershed

This WMA is also known as the Wallkill River Watershed and includes 11 Townships in Sussex County. The Wallkill River Watershed is unique in that its headwaters begin at Lake Mohawk in Sparta Township and then flow north into New York, eventually emptying into the Hudson River. Within WMA 2, there are four subwatersheds: the Wallkill River, Pochuck Creek, Papakating Creek and Rutgers Creek Tributaries (NJDEP 2012).

The Wallkill Watershed is approximately 208 square miles in area, and is comprised of a variety of land uses including rural and centralized residential development, agriculture, commercial, recreational and industrial usage. Also located within this watershed area is the Wallkill National Wildlife Refuge. The refuge watershed/wetlands complex provides migratory and nesting habitats for numerous birds and waterfowl and is home to several endangered species (NJDEP 2012).

WMA 2 occupies the northern and northeastern parts of Sussex County, extending south through Sparta and northern Byram Townships. The Wallkill River flows northeast into New York State, where it empties into the Hudson River near Kingston, New York. Major tributaries of the Wallkill River include Papakating Creek which begins its run in Frankford Township and Clove Brook which flows south from northern Wantage Township. Pochuck Creek is another major tributary which drains part of Vernon and Hardyston Townships east of Pochuck Mountain and enters the Wallkill River several miles into New York State (NJDEP 2012).

Watershed Management Area 3: Pompton, Pequannock, Wanaque, Ramapo Watersheds

WMA 3 is located within the Highlands Province of New Jersey. The Pequannock, Wanaque and Ramapo Rivers all flow into the Pompton River. The Pompton River is, in turn, a major tributary to the Upper Passaic River. WMA 3 contains some of the State's major water supply reservoir systems including the Wanaque Reservoir which is the largest surface water reservoir in New Jersey. There are four watersheds in WMA 3: Pompton, Ramapo, Pequannock and Wanaque River Watersheds. WMA 3 lies mostly in Passaic County but also includes parts of Bergen, Morris and Sussex Counties (NJDEP 2012).

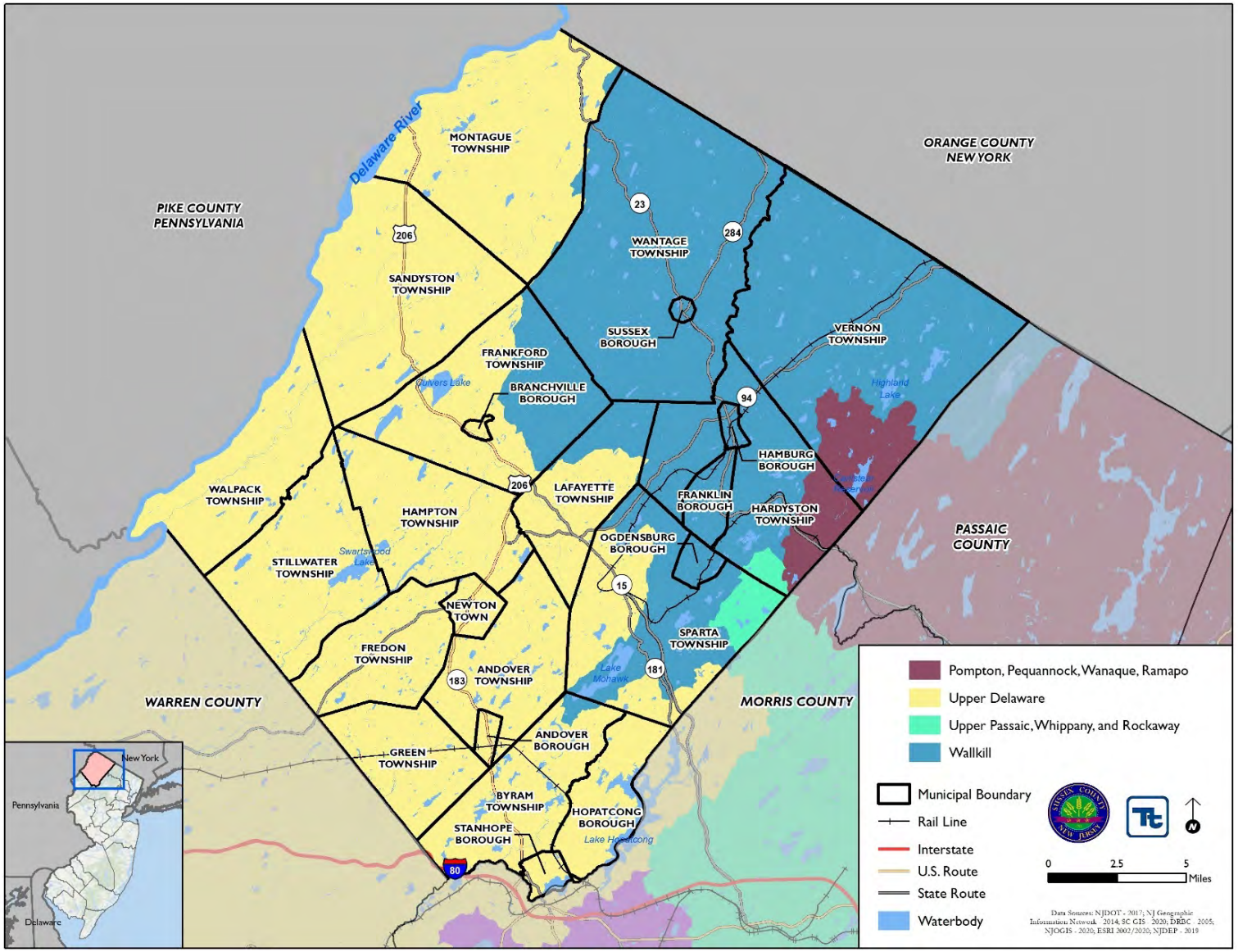
The Pequannock River Watershed occupies a small area of eastern Sussex County. It flows south out of Vernon Township and continues into Hardyston Township where it turns southeast, forming the border between Morris and Passaic Counties. The Pequannock's confluence with the Passaic River occurs at the eastern end of the Great Piece Meadows, where Morris, Passaic and Essex Counties meet. For most of its run in Sussex County, the Pequannock River flows through Newark's water supply management lands (NJDEP 2012).

Watershed Management Area 6: Upper and Mid Passaic, Whippany, Rockaway Watersheds

WMA 6 represents the area drained by waters from the upper reaches of the Passaic River Basin including the Passaic River from its headwaters in Morris County to the confluence of the Pompton River. WMA 6 is characterized by extensive suburban development and reliance upon ground water sources for water supply. WMA 6 lies in portions of Morris, Somerset, Sussex and Essex Counties and includes the Upper and Middle Passaic River, Whippany River and Rockaway River Watersheds (NJDEP 2012).

The Rockaway River begins in Jefferson Township and its system's upper reaches are in eastern Sparta Township, where several streams merge to form Russia Brook. Russia Brook flows into Jefferson Township where it meets the Rockaway River below Lake Swannanoa. From there, the Rockaway River flows into the Passaic River (NJDEP 2012).

Figure 3-2. Sussex County Watersheds



Topography and Geology

The topography of Sussex County is among the most diverse in the State of New Jersey. The eastern two-thirds lies within the Highlands physiographic province which runs in a northeast belt from Reading, Pennsylvania, across New Jersey, and into southern New York State and western Connecticut. This province is characterized by forested ridges and glacially sculpted valleys. It also contains significant water resources affecting over 11 million residents. The remainder of Sussex County lies within the Ridge and Valley physiographic province. This province is characterized by parallel northeast-southwest trending ridges wither fertile valleys in between. The capstone of the Ridge and Valley is the Kittatinny Ridge which runs approximately 40 miles through the county. The Ridge has elevations between 1,200 and 1,500 feet above sea level, and an average width of five miles. At High Point, the northernmost extent of the Kittatinny Ridge, has an elevation of 1,803 feet which is the highest point in New Jersey (Sussex County Natural Resources Inventory 2015).

The lowest points in Sussex County are found along the Delaware River at the mouth of Flat Brook (300 feet) and along the Wallkill River at the New York State line (380 feet). Located between the Highlands and Kittatinny Ridge, the Kittatinny Valley has elevations between 600 and 700 feet (Sussex County Natural Resources Inventory 2015)..

The Highlands is comprised of Precambrian rock, making it the oldest bedrock in New Jersey. The portion that runs through Sussex County is predominately granite and gneiss, with a small portion of marble. To the west of the Highlands, is Paleozoic rock, which includes shale, siltstone, and sandstone along Kittantiny Valley and limestone, shale, and sandstone along the Delaware River Basin (NJDEP 2014).

Climate

Sussex County has a temperate climate with warm summers and cold winters. The average temperatures range from approximately 32 degrees Fahrenheit (°F) in January to 75°F in July, with extremes common in the summer and winter months. The average precipitation yearly is approximately 54 inches (NOAA 2020).

Land Use, Land Cover, and Land Use Trends

Local zoning and planning authority are provided for under the New Jersey Municipal Land Use Law, which gives municipalities zoning and planning authority. The DMA 2000 requires that communities consider land use trends, which can impact the need for, and priority of, mitigation options over time. Land use trends significantly impact exposure and vulnerability to various hazards. For example, significant development in a hazard area increases the building stock and population exposed to that hazard.

This plan provides a general overview of population, land use and types of development occurring within the study area. An understanding of these development trends can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place to protect human health and community infrastructure.

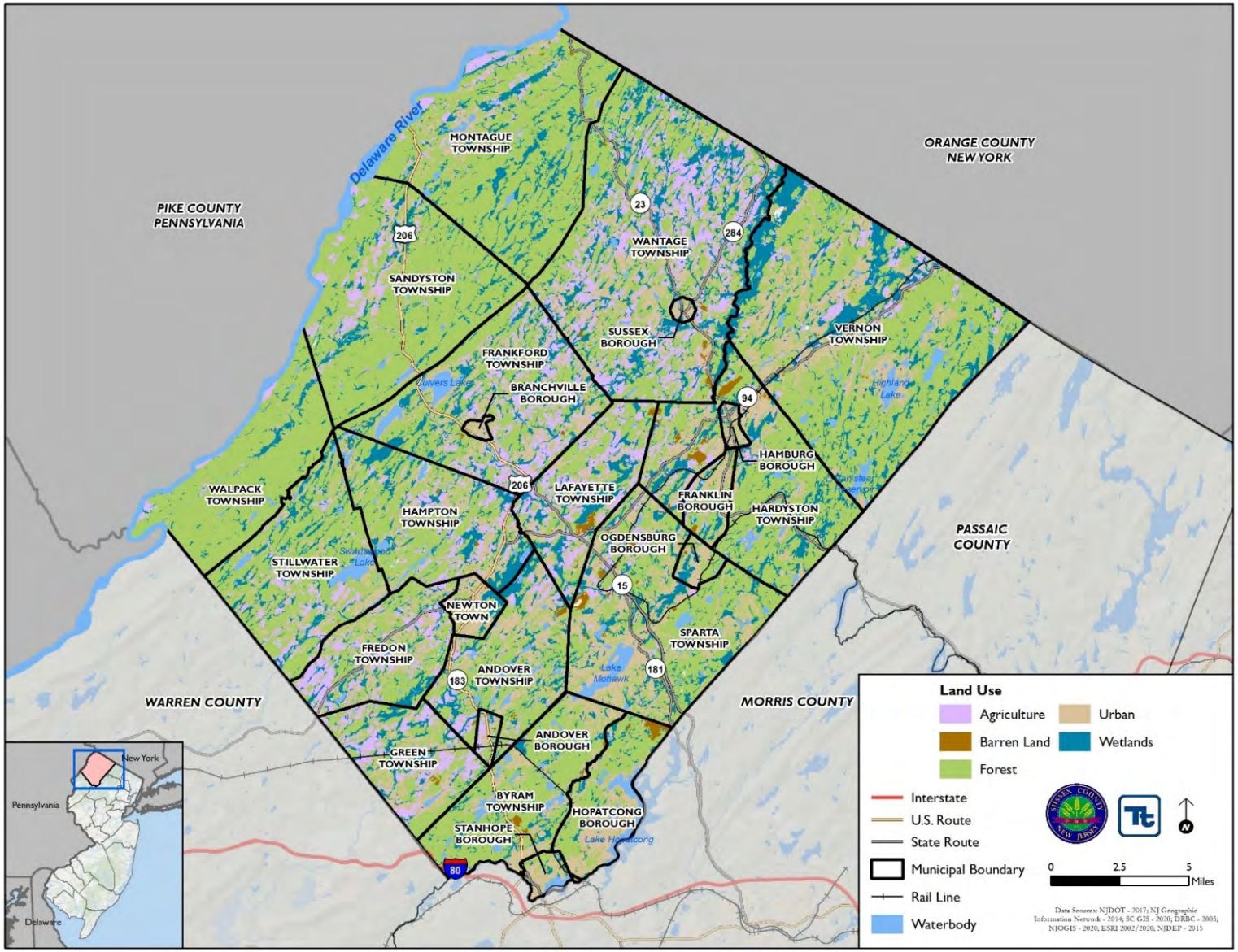
In 2012, the majority (55.9-percent) of the land in Sussex County was designated as forested land. The 2015 data shows there was a slight decrease in forested land(55.8-percent). In 2012, 15.9-percent was urban land; 13.6-percent was wetlands land; 0.6-percent was barren land; and 10.1-percent was agricultural lands. When compared with the land use land cover dataset from 2015, there has been a slight increase in urban land (16-percent). These land use types do not include water, which is just under 4-percent of the County. Refer to Figure 3-3 and Table 3-1 below.

Table 3-1. Land Use Summary of Sussex County, 2012 and 2015

Land Use Category	2012 Data		2015 Data	
	Acreage	Percent of Sussex County	Acreage	Percent of Sussex County
Agriculture	34,778	10.1%	34,629	10.1%
Barren	2,054	0.6%	2,125	0.6%
Forest	191,495	55.9%	191,143	55.8%
Urban	54,334	15.9%	54,839	16.0%
Wetlands	46,645	13.6%	46,799	13.7%

Source: NJDEP 2012/2015 LULC
Note: Urban land includes residential, industrial, transportation, and recreational land. Water is excluded from the table above.

Figure 3-3. Land Use/Land Cover in Sussex County

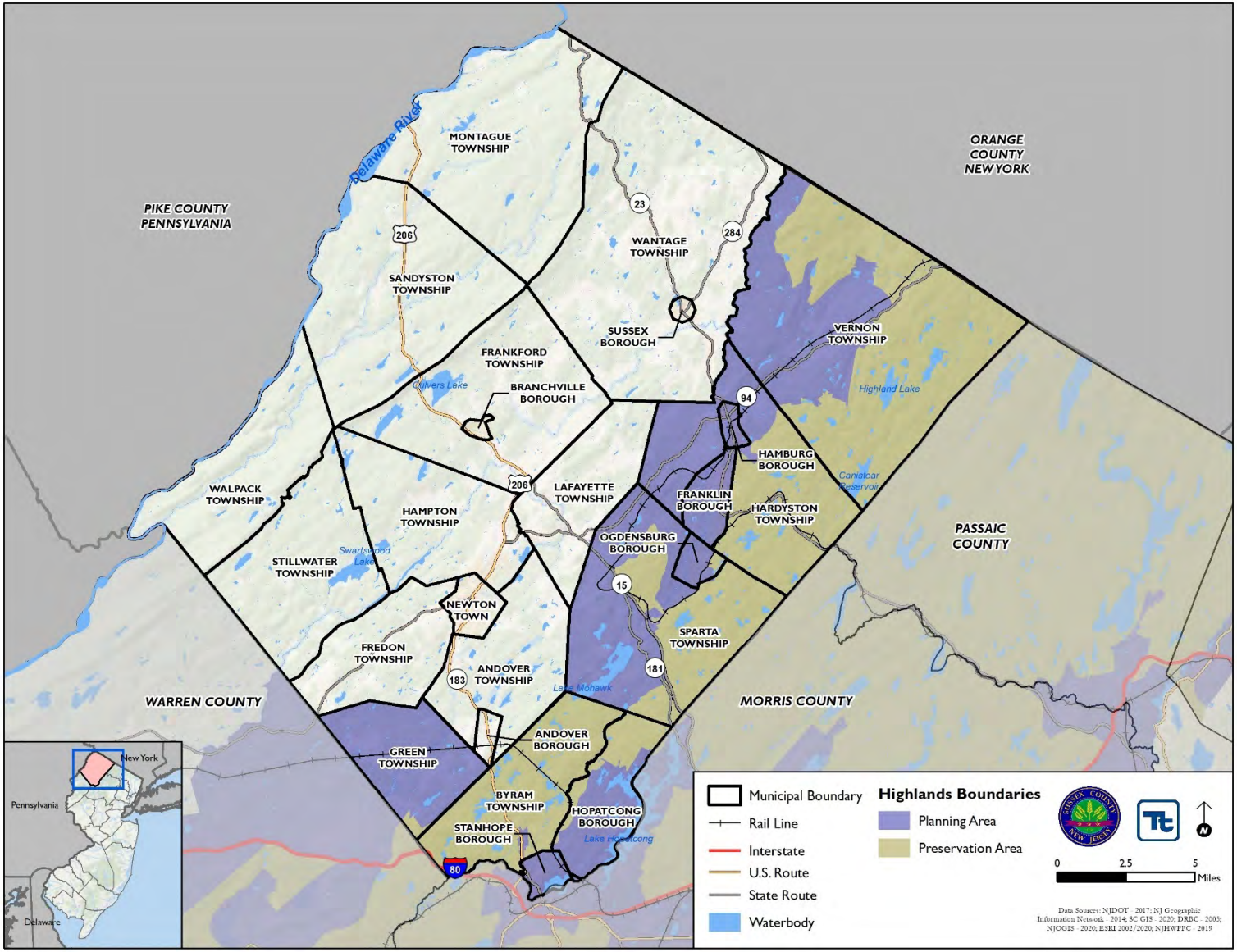


Highlands Region of New Jersey

The New Jersey Highlands is a 1,343 square mile area (over 800,000 acres) in the northwest portion of New Jersey. It is noted for its scenic beauty, environmental significance and serves as a vital source of drinking water for over half of New Jersey residents. The Highlands stretches from Phillipsburg (Warren County) in southwest New Jersey to Ringwood (Passaic County) in the northeast. The Highlands Region lies within portions of seven counties, Hunterdon, Somerset, Sussex, Warren, Morris, Passaic and Bergen, and includes 88 municipalities. The Highlands Act designates approximately 398,000 acres as the Highlands Preservation Area which is identified as an area of exceptional natural resource value. The remainder of the Highlands Region that is not located within the Preservation Area lies within the Highlands Planning Area. The distinction between the Preservation and Planning Area is that municipal and county conformance with the Highlands Regional Master Plan is required in the Preservation Area, and voluntary in the Planning Area.

The Highlands Area in Sussex County is located in the eastern portion of the County and consists of approximately 129,860 acres of land (Figure 3-4). The Townships of Byram, Green, Hardyston, Sparta and Vernon, and the Boroughs of Franklin, Hamburg, Hopatcong, Ogdensburg and Stanhope are within the Highlands boundary.

Figure 3-4. Highlands in Sussex County, New Jersey



Open Space and Parkland

Large portions of Sussex County are permanently set aside as public/conservation space. This includes the Delaware Water Gap National Recreation Area, state parks and forests (High Point and Stokes), and wildlife refuges (Wallkill). Public and conservation open space accounts for more than one-third of the County's total land area. Overall, open space in Sussex County includes federal, state, county, municipal, and water supply management land.

The National Park Service manages 5,354 acres (federal land) in western Sussex County in the municipalities of Sandyston and Stillwater. This area is known as the Delaware Water Gap National Recreation Area; a 55,857-acre unit of the National Park System located in New Jersey and Pennsylvania. The U.S. Fish and Wildlife Service manages 21,924 acres of land in County, known as the Wallkill River National Wildlife Refuge located in the Townships of Vernon and Wantage.

For state land, the New Jersey Division of Fish and Wildlife manages 12 Wildlife Management Areas in Sussex County, totaling 23,019 acres. The New Jersey Division of Parks and Forestry oversees state parks and trail corridors (Paulinskill Valley Trail, Sussex Branch Trail and Appalachian Trail) throughout New Jersey. In Sussex County, there are six state parks, one state forest, and three long-distance trails. Additionally, the New Jersey Natural Lands Trust is an independent agency within NJDEP in which properties are comparatively small relative to other state land. There are 15 Natural Lands Trust properties in Sussex County and the land management focuses on fish and wildlife habitat conservation as opposed to public recreation.

As for county-owned open space, Sussex County owns 441 acres of land in Franklin, Frankford, Hardyston, Newton, Sparta, and Vernon municipalities. On the municipal level, there are 4,499 acres of land used for parks, recreation areas, municipal buildings, and support services. Refer to Table 3-2 below for a summary of open space in Sussex County.

Additionally, there are 1,274 acres of private land used as open space and/or protected via conservation easements. There are also 10,175 acres of open space used for utilities in Sussex County. This land is primarily in Hardyston Township and Vernon Township, with the largest parcel being a 2,223 acre watershed in Vernon. Various non-profit organizations also own open space in Sussex County, totally 5,599 acres. For instance, The Nature Conservancy, New Jersey Audubon, and The Orange YMCA own 1,755, 570, and 607 acres, respectively. Lastly, there is 18,202 of acres of preserved farmland in the County (Sussex County Open Space and Recreation Plan 2016).

Table 3-2. Federal, State, County, or Municipal Open Space

Name of Facility	Federal, State, County or Municipal Owned	Size (acres in Sussex County)	Municipality
Wallkill River National Wildlife Refuge	Federal	4,635	Hardyston, Vernon, Wantage
Delaware Water Gap National Recreation Area	Federal	21,771	Walpack, Sandyston, Montague
Bear Swamp Wildlife Management Area (WMA)	State	2, 036	Frankford and Hampton
Culvers Brook Access WMA	State	4	Frankford
Flatbrook WMA	State	2,090	Sandyston, Walpack
Little Flatbrook Access WMA	State	4	Sandyston
Hainesville WMA	State	281	Montague, Sandyston
Hamburg Mountain WMA	State	2,737	Hardyston, Vernon

Name of Facility	Federal, State, County or Municipal Owned	Size (acres in Sussex County)	Municipality
Paulinskill River WMA	State	777	Fredon, Hampton
Sparta Mountain WMA	State	1,602	Hardyston, Ogdensburg, Sparta
Trout Brook WMA	State	1,098	Stillwater
Walpack WMA	State	387	Walpack
Weldon Brook WMA	State	829	Sparta
Whittingham WMA	State	1,930	Green, Fredon
Allamuchy Mountain State Park	State	5,000	Byram, Green, Stanhope
High Point State Park (includes AT west of Wallkill)	State	15,278	Wantage, Montague, Frankford
Hopatcong State Park	State	4	Hopatcong
Kittatinny Valley State Park	State	1,313	Andover Borough, Andover Township
Paulinskill Valley Trail/Sussex Branch Trail	State	556	Andover Borough, Andover Township, Byram, Frankford, Fredon, Hamburg, Hampton, Lafayette, Newton, Ogdensburg, Stillwater, Sparta
Stokes State Forest	State	15,734	Montague, Sandyston, Frankford, Hampton, Stillwater
Swartswood State Park	State	2,250	Hampton, Stillwater
Wawayanda State Park (includes AT east of Wallkill)	State	15,000	Vernon
Newark-Pequannock Watershed Easemen	State	3,896	Vernon
Congleton -CLC Partners/Smith (easement)	State	15	Hardyston
Congleton - Violante (easement)	State	16	Hardyston, Wantage
Congleton Wildlife Sanctuary	State	79	Hardyston, Wantage
Congleton Wildlife Sanctuary - CCK Realty)	State	127	Hardyston, Wantage, Lafayette
Congleton - Ferra (easement)	State	14	Hardyston
Congleton - Padula (easement)	State	18	Hardyston
Congleton - Williams (easement)	State	12	Hardyston
Congleton - Wildlife Sanctuary - Farm Association - Marx	State	100	Hardyston, Wantage
Crooked Swamp Caves	State	18	Lafayette
Elm Spring Preserve	State	11	Wantage
Lubbers Run	State	35	Byram
Lubbers Run - Vanderbilt	State	28	Byram
Lubbers Run - Vanderbilt II	State	28	Byram
McCarthy	State	4	Hopatcong
Papakating Creek	State	11	Frankford
Quarryville Brook	State	44	Wantage
Reinhardt - Weber	State	5	Montague
Reinhardt Preserve	State	240	Montague

Name of Facility	Federal, State, County or Municipal Owned	Size (acres in Sussex County)	Municipality
Reinhardt Preserve - Bunnell (easement)	State	34	Montague
Reinhardt Preserve - Coss	State	6	Montague
Reinhardt Preserve - Layne (easement	State	24	Montague
Reinhardt Preserve - Reinhardt I	State	14	Montague
Wallkill - May/Green Acres	State	13	Ogdensburg
Wallkill River	State	10	Sparta
Wallkill River Addition -NJCF	State	80	Ogdensburg
Wallkill River Addition - Predmore/Bennett	State	4	Ogdensburg
Wallkill River - Pope John High School	State	40	Sparta
Wallkill River Preserve - NJDOT	State	34	Sparta
Sussex County Park	County	1	Newton
Andover Township	Municipal	278	Andover Township
Byram	Municipal	92	Byram
Frankford	Municipal	9	Frankford
Fredon	Municipal	69	Fredon
Hamburg	Municipal	2	Hamburg
Hopatcong	Municipal	172	Hopatcong
Lafayette	Municipal	250	Lafayette
Newton	Municipal	49	Newton
Stanhope	Municipal	15	Stanhope
Stillwater	Municipal	242	Stillwater
Sussex Borough	Municipal	63	Sussex Borough
Vernon	Municipal	123	Vernon
Wantage	Municipal	157	Wantage

Source: Open Space and Recreation Plan 2003

3.2 POPULATION AND DEMOGRAPHICS

Knowledge of the composition of the population, how it has changed in the past and how it may change in the future is needed to make informed decisions. Information about population is a critical part of planning because it directly relates to needs such as housing, industry, stores, public facilities and services, and transportation.

3.2.1 POPULATION CHARACTERISTICS

The population of Sussex County was estimated at 142,298 in the 2014-2018 American Community Survey (ACS). According to the 2010 U.S. Census, Sussex County had a population of 149,265 people which represents a 4.7-percent decrease. Alternatively, there has been an increase in the elderly population (65 and over). The elderly population grew from 17,850 in 2010 to 22,889 in the 2014-2018 ACS 5-Year Census, which represents a 28-percent increase.

Table 3-3 and Table 3-4 present the population statistics for Sussex County based on the 2010 decennial Census' and the 2014-2018 American Community Survey (ACS) 5-Year Estimates. Figure 3-5 shows the distribution of

the general population density (persons per square mile) based on the 2014-2018 ACS 5-Year Estimates by Census block. Western Sussex County is not as densely populated as eastern Sussex County due to its location within the Delaware River Basin. The basin has steep grades, making it difficult to construct homes and businesses.

Population density has a strong correlation with hazard vulnerability and loss. Urban areas tend to have larger populations and numbers of structures; therefore, these areas tend to experience greater loss during hazard events. Hazus demographic data will be used in the loss estimating analyses in Section 4 (Risk Assessment) of this plan. All demographic data in Hazus corresponds to the 2010 U.S. Census.

Table 3-3. Sussex County 2010 Population Statistics

Jurisdiction	U.S. Census 2010						
	Total	Population 65+	Percent (%)Population 65+	Population Under 16	Percent (%)Population Under 16	Low Income Population*	Percent (%) Low Income Population*
Andover (B)	606	73	12.0%	128	21.1%	28	4.6%
Andover (Twp)	6,319	1,012	16.0%	1,374	21.7%	91	1.4%
Branchville (B)	841	141	16.8%	183	21.8%	46	5.5%
Byram (Twp)	8,350	843	10.1%	2,146	25.7%	104	1.2%
Frankford (Twp)	5,565	921	16.5%	1,176	21.1%	124	2.2%
Franklin (B)	5,045	659	13.1%	1,119	22.2%	323	6.4%
Fredon (Twp)	3,437	469	13.6%	882	25.7%	52	1.5%
Green (Twp)	3,601	388	10.8%	1,021	28.4%	50	1.4%
Hamburg (B)	3,277	385	11.7%	741	22.6%	212	6.5%
Hampton (Twp)	5,196	768	14.8%	1,095	21.1%	142	2.7%
Hardyston (Twp)	8,213	1,194	14.5%	1,741	21.2%	348	4.2%
Hopatcong (B)	15,147	1,489	9.8%	3,394	22.4%	262	1.7%
Lafayette (Twp)	2,538	325	12.8%	593	23.4%	52	2.0%
Montague (Twp)	3,847	536	13.9%	877	22.8%	140	3.6%
Newton (T)	7,997	1,481	18.5%	1,718	21.5%	810	10.1%
Ogdensburg (B)	2,410	275	11.4%	590	24.5%	104	4.3%
Sandyston (Twp)	1,998	234	11.7%	448	22.4%	57	2.9%
Sparta (Twp)	19,722	2,198	11.1%	5,688	28.8%	251	1.3%
Stanhope (B)	3,610	374	10.4%	817	22.6%	74	2.0%
Stillwater (Twp)	4,099	459	11.2%	896	21.9%	199	4.9%
Sussex (B)	2,130	261	12.3%	485	22.8%	176	8.3%
Vernon (Twp)	23,943	2,019	8.4%	5,824	24.3%	403	1.7%
Walpack (Twp)	16	4	25.0%	2	12.5%	0	0.0%
Wantage (Twp)	11,358	1,342	11.8%	2,835	25.0%	163	1.4%
Sussex County (Total)	**149,265**	**17,850**	**12.0%**	**35,773**	**24.0%**	**4,211**	**2.8%**

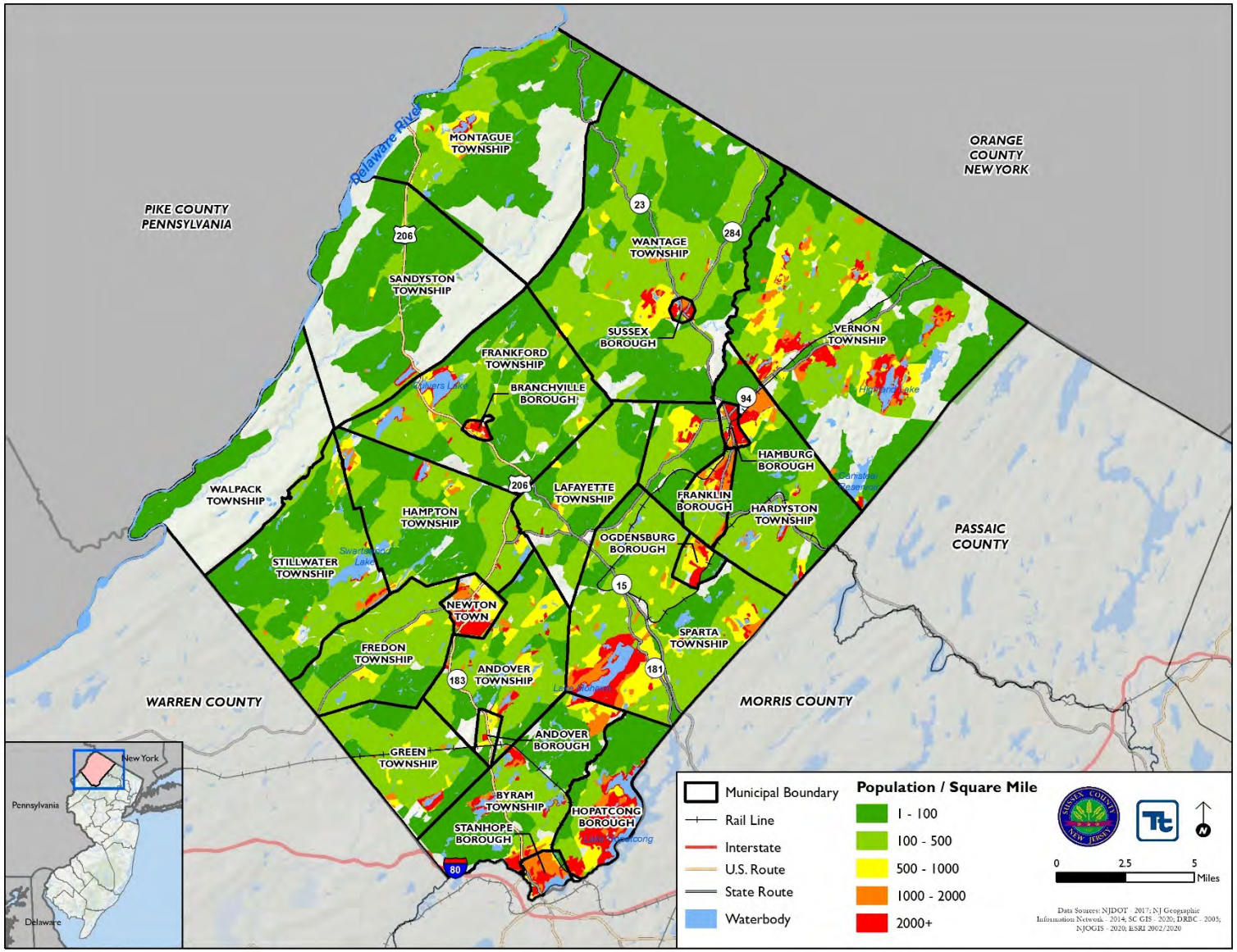
Source: U.S. Census Bureau: Census 2010; Hazus v4.2 2010 population demographics
*Note: * Individuals below poverty level (Hazus v4.2 - Income less than $20,000)*
B = Borough; T = Town; Twp = Township

Table 3-4. Sussex County 2014-2018 American Community Survey Population Statistics

Jurisdiction	2014-2018 American Community Survey										
	Total	Population 65+	Percent (%) Population 65+	Population Under 5	Percent (%) Under 5	Population Below Poverty Level*	Percent (%) Below Poverty Level	Disability Population	Percent (%) Disability Population	Non-English Speaking Population	Percent (%) Non-English Speaking Population
Andover (B)	594	99	16.7%	30	5.1%	28	4.7%	53	8.9%	9	1.5%
Andover (Twp)	5,996	1,392	23.2%	219	3.7%	340	5.7%	671	11.2%	252	4.2%
Branchville (B)	896	128	14.3%	62	6.9%	88	9.8%	113	12.6%	3	0.3%
Byram (Twp)	8,010	1,101	13.7%	379	4.7%	194	2.4%	678	8.5%	176	2.2%
Frankford (Twp)	5,361	1,080	20.1%	171	3.2%	305	5.7%	567	10.6%	49	0.9%
Franklin (B)	4,807	654	13.6%	287	6.0%	394	8.2%	613	12.8%	87	1.8%
Fredon (Twp)	3,214	577	18.0%	120	3.7%	251	7.8%	352	11.0%	17	0.5%
Green (Twp)	3,495	530	15.2%	83	2.4%	188	5.4%	402	11.5%	109	3.1%
Hamburg (B)	3,152	485	15.4%	132	4.2%	217	6.9%	226	7.2%	34	1.1%
Hampton (Twp)	4,916	956	19.4%	138	2.8%	345	7.0%	655	13.3%	191	3.9%
Hardyston (Twp)	7,886	1,485	18.8%	436	5.5%	261	3.3%	696	8.8%	121	1.5%
Hopatcong (B)	14,362	1,965	13.7%	732	5.1%	511	3.6%	1,539	10.7%	786	5.5%
Lafayette (Twp)	2,390	434	18.2%	128	5.4%	124	5.2%	298	12.5%	158	6.6%
Montague (Twp)	3,716	644	17.3%	138	3.7%	178	4.8%	644	17.3%	34	0.9%
Newton (T)	7,895	1,417	17.9%	315	4.0%	1,027	13.0%	1,232	15.6%	502	6.4%
Ogdensburg (B)	2,314	369	15.9%	83	3.6%	129	5.6%	240	10.4%	100	4.3%
Sandyston (Twp)	1,925	381	19.8%	113	5.9%	80	4.2%	264	13.7%	71	3.7%
Sparta (Twp)	18,841	2,590	13.7%	993	5.3%	533	2.8%	1,455	7.7%	532	2.8%
Stanhope (B)	3,377	450	13.3%	123	3.6%	138	4.1%	415	12.3%	89	2.6%
Stillwater (Twp)	3,936	857	21.8%	224	5.7%	247	6.3%	532	13.5%	0	0%
Sussex (B)	1,854	233	12.6%	105	5.7%	297	16.0%	285	15.4%	62	3.3%
Vernon (Twp)	22,369	3,059	13.7%	979	4.4%	848	3.8%	2,261	10.1%	439	2.0%
Walpack (Twp)	6	6	100.0%	0	0%	0	0%	0	0%	0	0%
Wantage (Twp)	10,986	1,997	18.2%	458	4.2%	468	4.3%	1,027	9.3%	179	1.6%
Sussex County (Total)	**142,298**	**22,889**	**16.1%**	**6,448**	**4.5%**	**7,191**	**5.1%**	**15,218**	**10.7%**	**4,000**	**2.8%**

Source: U.S. Census Bureau 2014-2018
*Note: * Individuals below poverty level (Census poverty weighted average threshold for a 3-person family unit in 2018 was approximately $19,985)*
B = Borough; T = Town; Twp = Township

Figure 3-5. Distribution of General Population for Sussex County, New Jersey



3.2.2 VULNERABLE POPULATIONS

Research has shown that some populations, while they may not have more hazard exposure, may experience exacerbated impacts and prolonged recovery if/when impacted. This is due to many factors including their physical and financial ability to react or respond during a hazard. Identifying concentrations of vulnerable populations can assist communities in targeting preparedness, response and mitigation actions. For the purposes of this planning process, vulnerable populations in Sussex County include children, elderly, low-income, the physically or mentally disabled, non-English speakers and the medically or chemically dependent.

Age

Children are considered vulnerable because they are dependent on others to safely access resources during emergencies. The elderly are more apt to lack the physical and economic resources necessary for response to hazard events and are more likely to suffer health-related consequences making recovery slower. Those living on their own may have more difficulty evacuating their homes. The elderly are also more likely to live in senior care and living facilities where emergency preparedness occurs at the discretion of facility operators. Senior care and living facilities are also most vulnerable to hazards like pandemics in light of the close living arrangements combined with older populations with potentially weakened immune systems or pre-existing health issues that may be accentuated during an event like a pandemic.

According to the 2014-2018 ACS 5-Year estimates, the mean age in Sussex County was 44.8 years. Of the 2014-2018 population, 22,889 (13.6%) of the County's population is age 65 and older; an increase from 2010 (28-percent). The Census also reports a population under 5 of 6,448. Figure 3-5 shows the distribution of persons under the age of 5 and over 65 in purple and orange, respectively based on the 2014-2018 ACS 5-Year estimates.

Income

Of the total population, economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions based on the major economic impact to their family and may not have funds to evacuate. The 2014-2018 ACS data identified approximately 7,191 people as low-income. According to the Census' 2019 poverty thresholds, the weighted average thresholds for a family of four in 2018 was $25,701; for a family of three, $19,985; for a family of two, $12,784, and for unrelated individuals, $13,016. Figure 3-5 shows the distribution of low-income persons in Sussex County.

According to the 2014-2018 ACS 5-Year estimates, there were 7,191 people in poverty in Sussex County; an increase from the 2010 low-income population (4,211). It is noted that the 2010 Census data for household income provided in Hazus includes two ranges ($0-10,000 and $10,000-$20,000/year) that were totaled to provide the "low-income" data used in this study. This does not correspond exactly with the "poverty" thresholds established by the updated ACS statistics; however, this difference is not believed to be significant for the purposes of this planning effort.

Physically or Mentally Disabled

The Center for Disease Control and Prevention (CDC) defines a disability as a "condition of the body or mind (impairment) that makes it more difficult for the person with the condition to do certain activities (activity limitation) and interact with the world around them (participation restrictions)" (CDC 2020). These impairments may increase the level of difficulty that individuals may face during an emergency. Cognitive impairments may reduce an individual's capacity to receive, process, and respond to emergency information or warnings. Individuals with a physical or sensory disability may face issues of mobility, sight, hearing, or reliance on specialized medical equipment. According to the 2014-2018 ACS, 10.7-percent of residents of Sussex County are living with a disability. Figure 3-5 shows the geographic distribution of disabled individuals throughout

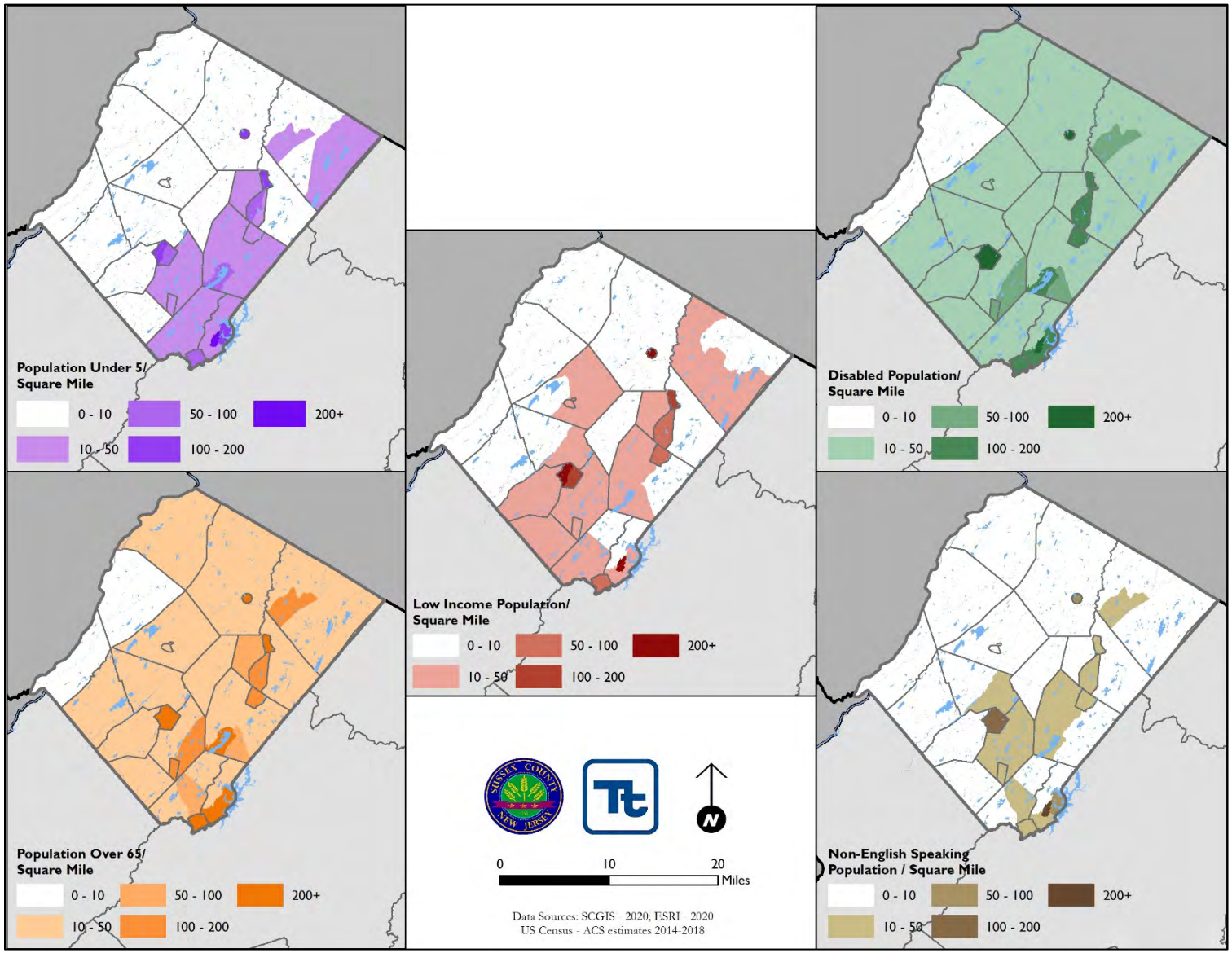
Sussex County which includes individuals with hearing, vision, cognitive, ambulatory, self-care, and independent living difficulties.

Non-English Speakers

Individuals who are not fluent or have a working proficiency in English may be vulnerable to hazard events because they may have difficulty with understanding information being conveyed to them. Cultural differences can also add complexity to how information is being conveyed to populations with limited proficiency of English (CDC 2020).

According to the 2014-2018 ACS, 2.8-percent of the County's population over the age of 5 speaks a language other than English at home; this is significantly less than the State average of 30-percent. Figure 3-6 shows the geographic distribution of non-English speakers throughout Sussex County.

Figure 3-6. Distribution of Socially Vulnerable Populations in Sussex County



3.2.3 POPULATION TRENDS

Population trends can provide a basis for making decisions on the type of mitigation approaches to consider and the locations in which these approaches should be applied. This information can also be used to support planning decisions regarding future development in vulnerable areas.

According to the 2014-2018 ACS, Sussex County's population was 142,298 persons, which is a 4.7-percent decrease from the 2010 Census population of 149,265. Between 1900 and 2010, the County experienced overall growth. Between 1960 and 1970, the County experienced its largest increase in population: 57.4-percent. The smallest increase was between 2000 and 2010, when the population increased by 3.5-percent. Since 2010, the population has been decreasing, but the largest decrease was between 1910 and 1920, when the County experienced a 7-percent decrease in population (New Jersey State Data Center 2001).

Over the past 10 years, the County experienced population decline and is expected to shrink in the coming years. Table 3-5 displays the population and change in population from 1900 to 2018 in Sussex County.

Table 3-5. Sussex County Population Trends, 1900 to 2018

Year	Population	Change in Population	Percent Population Change
1900	24,134	N/A	N/A
1910	26,781	2,647	11.0%
1920	24,905	-1,876	-7.0%
1930	27,830	2,925	11.7%
1940	29,632	1,802	6.5%
1950	34,423	4,791	16.2%
1960	49,255	14,832	43.1%
1970	77,528	28,273	57.4%
1980	116,119	38,591	49.8%
1990	130,943	14,824	12.8%
2000	144,166	13,223	10.1%
2010	149,265	5,099	3.5%
2014	146,888	-2,377	-1.6%
2018	142,298	-4,590	-3.1%

Source: U.S. Census Bureau 2018; New Jersey State Data Center 2001
Note: % - Percent
Change in population and percent in population change was calculated from available data

Table 3-6 displays the ten largest municipalities in Sussex County. According to the 2014-2018 ACS data, the Township of Vernon was the most populous municipality, comprising 15.7-percent of the County's total population.

Table 3-6. Ten Largest Municipalities in Sussex County

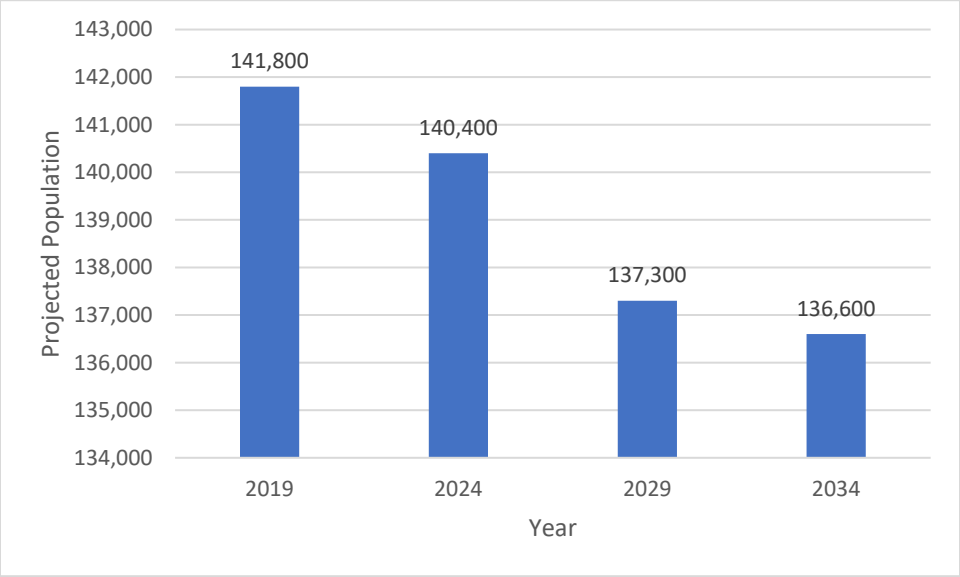
Rank	Jurisdiction	Total
1	Vernon (Twp)	22,369
2	Sparta (Twp)	18,841
3	Hopatcong (B)	14,362

Rank	Jurisdiction	Total
4	Wantage (Twp)	10,986
5	Byram (Twp)	8,010
6	Newton (T)	7,895
7	Hardyston (Twp)	7,886
8	Andover (Twp)	5,996
9	Frankford (Twp)	5,361
10	Hampton (Twp)	4,916

Source: 2014-2018 ACS Census
B = Borough; T = Town; Twp = Township

Over the next 15 years, it is projected that population will continue to decline in Sussex County (-3.7-percent). Based on New Jersey Department of Labor population projections, the County population is expected to reduce to 140,400 by 2024, 137,300 by 2029, and 136,600 by 2034 (Figure 3-7 and Table 3-7).

Figure 3-7. Sussex County Population Projections, 2019 to 2034



Source: New Jersey Department of Labor and Workforce Development 2019

Table 3-7. Population Trends in Sussex County by Jurisdiction

Jurisdiction	2010 Census	2014-2018 ACS	Change in Population	Percent Population Change
Andover (B)	606	594	-12	-2.0%
Andover (Twp)	6,319	5,996	-323	-5.1%
Branchville (B)	841	896	55	6.5%
Byram (Twp)	8,350	8,010	-340	-4.1%
Frankford (Twp)	5,565	5,361	-204	-3.7%
Franklin (B)	5,045	4,807	-238	-4.7%
Fredon (Twp)	3,437	3,214	-223	-6.5%
Green (Twp)	3,601	3,495	-106	-2.9%

Jurisdiction	2010 Census	2014-2018 ACS	Change in Population	Percent Population Change
Hamburg (B)	3,277	3,152	-125	-3.8%
Hampton (Twp)	5,196	4,916	-280	-5.4%
Hardyston (Twp)	8,213	7,886	-327	-4.0%
Hopatcong (B)	15,147	14,362	-785	-5.2%
Lafayette (Twp)	2,538	2,390	-148	-5.8%
Montague (Twp)	3,847	3,716	-131	-3.4%
Newton (T)	7,997	7,895	-102	-1.3%
Ogdensburg (B)	2,410	2,314	-96	-4.0%
Sandyston (Twp)	1,998	1,925	-73	-3.7%
Sparta (Twp)	19,722	18,841	-881	-4.5%
Stanhope (B)	3,610	3,377	-233	-6.5%
Stillwater (Twp)	4,099	3,936	-163	-4.0%
Sussex (B)	2,130	1,854	-276	-13.0%
Vernon (Twp)	23,943	22,369	-1,574	-6.6%
Walpack (Twp)	16	6	-10	-62.5%
Wantage (Twp)	11,358	10,986	-372	-3.3%
Sussex County (Total)	**149,265**	**142,298**	**-6,967**	**-4.7%**

Source: 2014-2018 ACS Census
B = Borough; T = Town; Twp = Township

Between 2010 and 2018, all jurisdictions, but one, experienced population decline. The Borough of Branchville was the only municipality to increase its population (841 to 896). The Township of Walpack and the Borough of Sussex were the two municipalities with the largest percentage of population reduction: 62.5-percent and 13-percent, respectively.

3.3 GENERAL BUILDING STOCK

The 2014-2018 ACS data identified 53,361 households (62,371 housing units) in Sussex County which is a small decrease in total households (-2.8-percent) but an increase in housing units (+0.5-percent) from 2010 to 2018. The U.S. Census defines a household as all persons who occupy a housing unit, and a housing unit as a house, apartment, mobile home, group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Therefore, you may have more than one household per housing unit. The median price of a single-family home in Sussex County was estimated at $279,600 (ACS, 2014-2018).

For the HMP update, a custom-building inventory was developed to assess the current built environment's risk to natural hazards. The building stock update was performed using the most current parcel and tax assessment data provided by the New Jersey Geographic Information Network. There are approximately 72,021 structures included in the inventory with an estimated replacement cost value (RCV) of approximately $60 billion (structure and contents). Estimated content value was calculated by using 50-percent of the residential and parking replacement cost value, 100-percent of the commercial, industrial construction, religious, government and primary education values, and 150-percent of hospitals, industrial, emergency government and secondary education values. Actual content value various widely depending on the usage of the structure. Approximately 86.7-percent of the total buildings in the County are residential, which make up approximately 39.8-percent of

the County's total replacement cost value. Table 3-8 presents building stock statistics by occupancy class for Sussex County.

The 2014-2018 ACS for Sussex County identified that the majority of housing units (80.1-percent) are one-unit detached units. The 2018 U.S. Census Bureau's County Business Patterns data identified a total 3,207 business establishments employ 31,622 people in Sussex County. The Construction industry has the greatest number of establishments in the County, with 512 and the Healthcare and Social Assistance industry has the greatest number of employees in the County, with 5,998.

Figure 3-8 through Figure 3-10 show the distribution and exposure density of residential, commercial, and industrial buildings in Sussex County. Exposure density is the dollar value of structures per unit area, including building content value. The densities are shown in units of $1,000 ($K) per square mile. Viewing exposure distribution maps can assist communities in visualizing areas of high exposure and in evaluating aspects of the study area in relation to the specific hazard risks.

Table 3-8. Number of Buildings and Replacement Cost Value by Occupancy Class

Jurisdiction	All Occupancies				Residential		Commercial		Industrial	
	Count	Replacement Cost Value (Structure Only)	Replacement Cost Value (Contents Only)	Total Replacement Cost Value (Structure + Contents)	Count	Total Replacement Cost Value (Structure + Contents)	Count	Total Replacement Cost Value (Structure + Contents)	Count	Total Replacement Cost Value (Structure + Contents)
Andover (B)	328	$332,119,752	$296,343,278	$628,463,030	234	$113,045,719	69	$464,742,666	2	$1,963,145
Andover (Twp)	2,584	$1,950,232,362	$1,659,447,362	$3,609,679,724	2,144	$976,175,392	159	$1,915,807,334	14	$69,582,340
Branchville (B)	426	$283,245,897	$249,131,471	$532,377,368	339	$123,183,329	71	$351,922,955	1	$23,764,725
Byram (Twp)	3,676	$1,568,849,755	$1,177,700,691	$2,746,550,446	3,345	$1,195,284,013	112	$1,258,359,318	2	$4,331,196
Frankford (Twp)	3,537	$1,739,300,413	$1,390,587,892	$3,129,888,305	2,783	$1,193,756,590	174	$818,858,093	9	$49,270,892
Franklin (B)	2,061	$1,074,588,863	$846,622,993	$1,921,211,856	1,819	$750,769,532	150	$855,563,757	14	$96,080,193
Fredon (Twp)	1,615	$779,059,999	$592,990,935	$1,372,050,934	1,213	$585,811,657	43	$90,249,154	6	$44,769,432
Green (Twp)	1,698	$920,306,992	$678,328,812	$1,598,635,804	1,377	$791,714,893	28	$133,482,533	4	$93,921,824
Hamburg (B)	1,594	$859,898,957	$728,150,334	$1,588,049,291	1,473	$469,464,565	95	$849,357,791	8	$99,532,914
Hampton (Twp)	2,763	$1,239,383,737	$956,747,861	$2,196,131,598	2,303	$865,409,960	106	$635,639,668	1	$7,938,962
Hardyston (Twp)	4,403	$1,807,469,173	$1,375,564,369	$3,183,033,542	3,965	$1,400,824,808	188	$1,196,445,035	20	$112,756,086
Hopatcong (B)	8,040	$1,767,028,668	$1,121,543,007	$2,888,571,676	7,641	$1,924,437,823	180	$652,082,684	0	$0
Lafayette (Twp)	1,462	$1,036,755,531	$921,418,534	$1,958,174,065	958	$501,339,546	95	$489,709,499	28	$87,340,680
Montague (Twp)	2,175	$833,154,433	$626,456,587	$1,459,611,020	1,870	$633,887,759	92	$423,339,200	8	$16,169,966
Newton (T)	2,679	$2,711,511,234	$2,381,764,573	$5,093,275,807	2,245	$1,333,560,567	284	$2,879,641,363	21	$275,709,494
Ogdensburg (B)	992	$462,330,280	$357,549,349	$819,879,629	909	$339,343,924	49	$332,727,893	3	$31,865,808
Sandyston (Twp)	1,528	$666,040,739	$546,585,925	$1,212,626,664	1,094	$381,205,972	89	$295,884,103	7	$38,069,215
Sparta (Twp)	8,132	$5,023,898,047	$4,046,196,238	$9,070,094,285	7,386	$3,177,699,823	429	$4,849,008,402	41	$225,283,240
Stanhope (B)	1,557	$602,241,781	$448,941,800	$1,051,183,581	1,449	$547,646,500	66	$250,585,937	7	$136,583,953
Stillwater (Twp)	2,493	$824,560,953	$593,018,445	$1,417,579,398	1,970	$696,478,590	144	$210,525,888	0	$0
Sussex (B)	678	$1,002,618,047	$942,960,869	$1,945,578,916	551	$392,993,541	80	$1,357,013,187	7	$46,870,858
Vernon (Twp)	12,039	$3,408,279,379	$2,250,691,784	$5,658,971,163	11,182	$3,599,814,313	384	$967,786,928	49	$141,369,394
Walpack (Twp)	51	$32,321,714	$31,369,836	$63,691,550	11	$2,855,635	21	$15,107,778	0	$0
Wantage (Twp)	5,510	$2,745,134,777	$2,132,409,108	$4,877,543,885	4,168	$1,898,743,239	196	$922,529,675	6	$12,851,984
Sussex County (Total)	**72,021**	**$33,670,331,484**	**$26,352,522,055**	**$60,022,853,539**	**62,429**	**$23,895,447,689**	**3,304**	**$22,216,370,842**	**258**	**$1,616,026,301**

Source: New Jersey Geographic Information Network 2019

B = Borough; RCV = Replacement Cost Value; T = Town; Twp = Township

Figure 3-8. Distribution of Residential Building Stock and Value Density in Sussex County

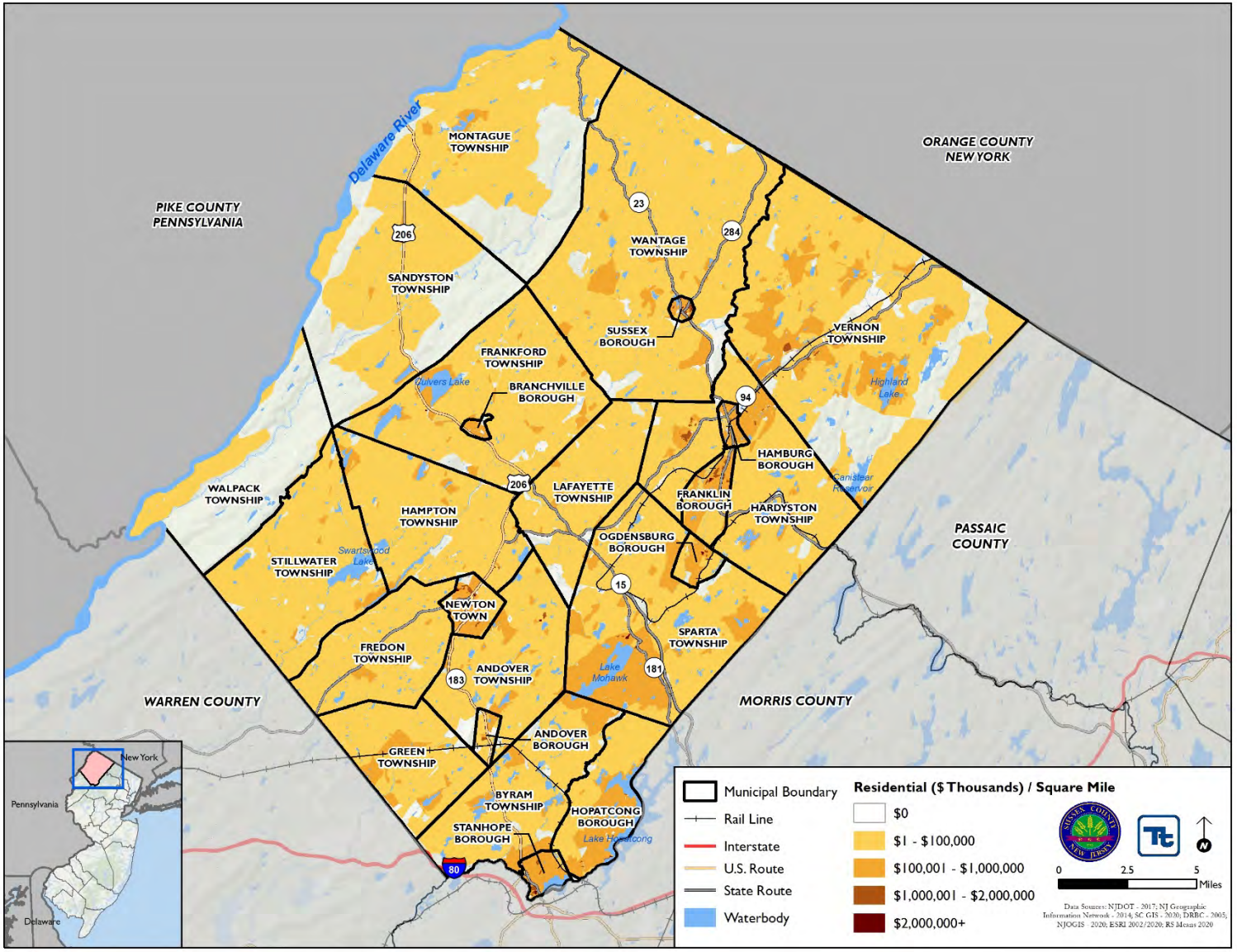


Figure 3-9. Distribution of Commercial Building Stock and Value Density in Sussex County

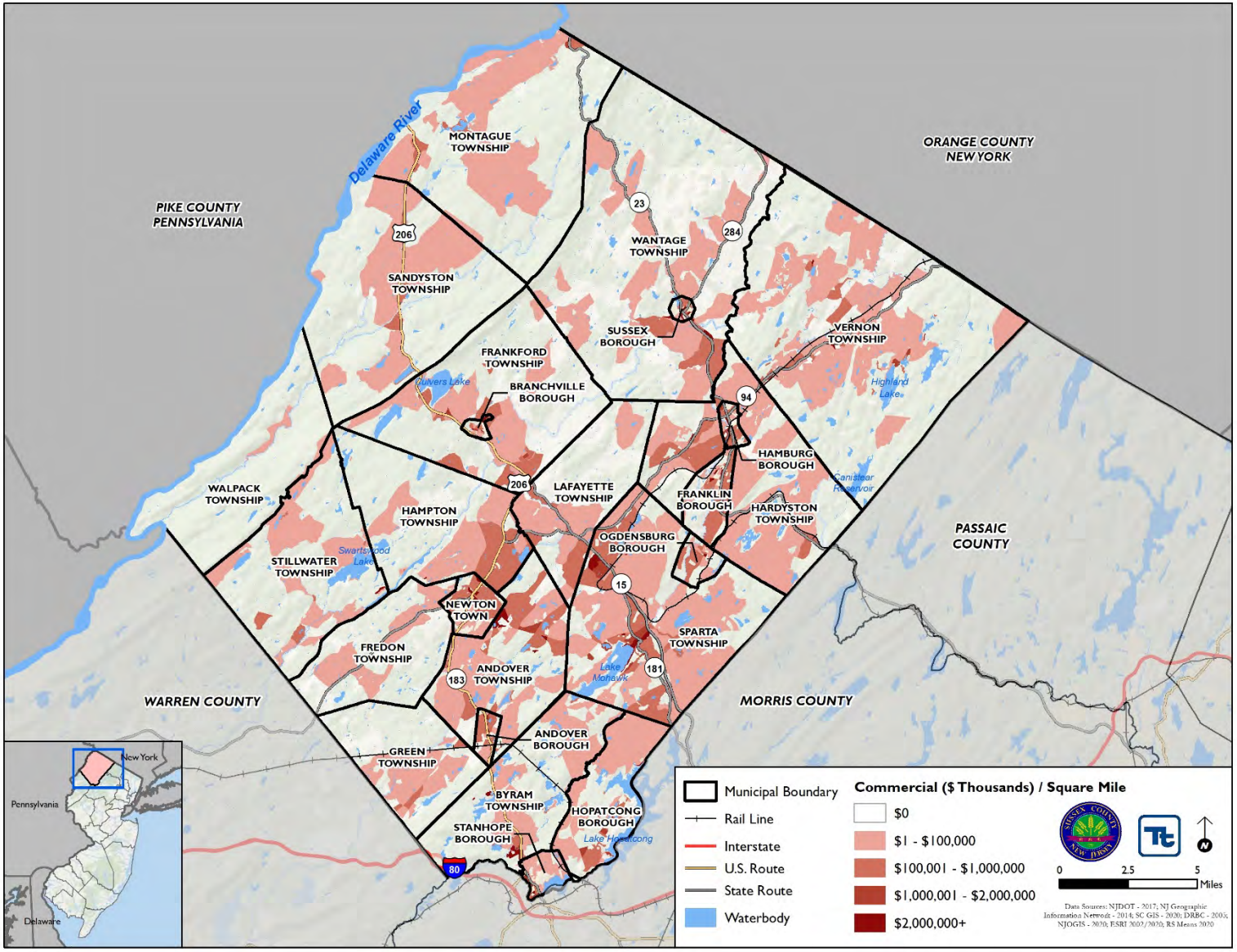
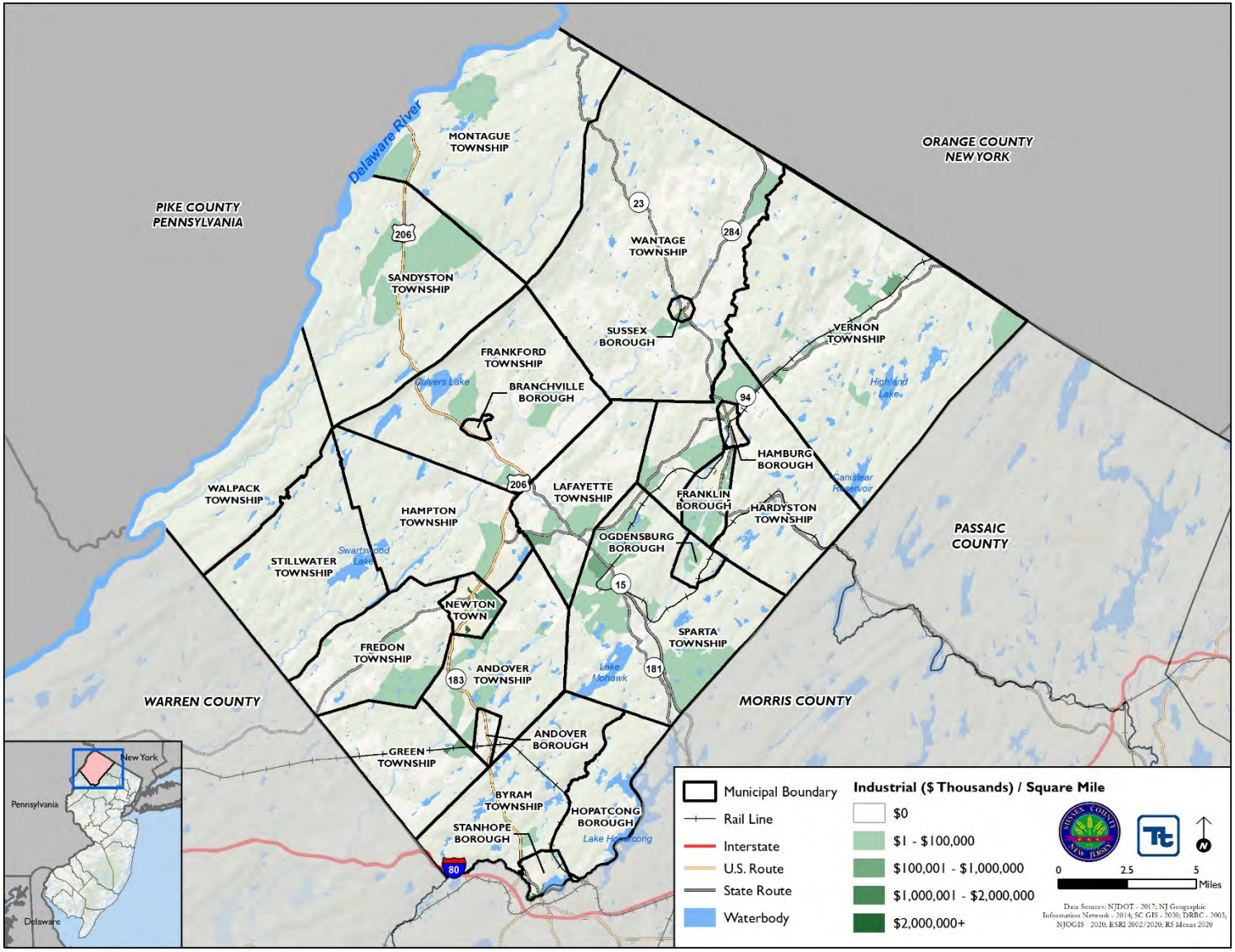


Figure 3-10. Distribution of Industrial Building Stock and Value Density in Sussex County



3.4 ECONOMY

As discussed in the FEMA Local Mitigation Handbook, after a natural hazard event, economic resiliency drives recovery. An understanding of the major employers and economic sectors in the County whose losses or inoperability would impact the community and its ability to recover from a disaster is essential. The following provides information regarding the economy in Sussex County.

Sussex County's early industry and commerce were chiefly centered on agriculture, milling, and iron and zinc mining. The local economy expanded due to the introduction of the railroads, which helped the development of factories following the Civil War and continuing to the 1960s. In the second half of the twentieth century, the auto-dependent suburban areas surrounding New York City boomed. Highway infrastructure was set in place and formally rural areas were engulfed by the migration of the middle-class. However, by the 1970's manufacturing began to move to the south, leaving factories out-of-business and vacant (Together New Jersey 2014).

Sussex County completed the Strategic Growth Plan Update in November 2014. The plan identified six focus areas: Tourism, Transportation, Housing, Industrial and Commercial Development, Reducing the Regulatory Burden, and Agriculture. Of these focus areas, Tourism, Transportation, and Housing were considered high priority, Industrial and Commercial Development and Reducing Regulatory Burden were considered medium priority, and Agriculture was considered low priority. These focus areas were assessed to 1) find existing conditions and trends; 2) identify key assets and resources, and; 3) highlight issues and process for securing economic growth. The report presented a total of 45 actions, which included recommended policy or legislative changes, additional studies to be performed, implementation strategies, and new specific projects (Sussex County 2014).

While manufacturing in the County has declined, the County is still home to several manufacturers including Ames Rubber Corp, a manufacturer of molded components, protective coatings, and dispensed gaskets for high-tech applications and ThorLabs, a manufacturer of high-tech components for the laser and fiber optics industry. Today, the fastest growing sectors of the economy are tourism and recreation. The industries represented by the 10 largest employers include recreation, healthcare, retail, education and government; refer to Table 3-9.

Table 3-9. Top Ten Sussex County Employers

Employer	Location	Employment	Industry
Crystal Springs Golf and Spa Resort	Vernon/Hardyston	2,000	Recreation
Newton Medical Center	Newton	1,200	Healthcare
Selective Insurance	Branchville	900	Insurance
Mountain Creek Resort	Vernon	800	Recreation
County of Sussex	Newton	500	Government
Ames Rubber Corp.	Hamburg	445	Manufacturing
Shop Rite Supermarkets	Newton	301	Retail
Andover Subacute and Rehab Center	Andover	300	Healthcare
Sussex County Community College	Newton	300	Education
Raider Express	Andover	250	Trucking/Logistics

Source: Sussex County 2014

According to the 2014 update of the Strategic Growth Plan, the largest employment sector in Sussex County is Education and Healthcare, followed by Trade, Transportation, and Utilities, and Leisure and Hospitality. Sussex

County appears to be under-represented in its share of employment in higher-paying industries such as Information, Financial Activities, and Business & Professional Services. These industries are typically considered export-based industries that bring money into the region and have a wealth creating impact on the local economy. The county is over-represented in lower paying industries such as Education and Healthcare, Leisure and Hospitality, and Personal Services. These industries are considered non-basic industries, and except for Leisure and Hospitality, do not bring money into the local economy and as a result have smaller multiplier impacts on the local economy (Sussex County 2014).

Sussex County employment has decreased in a majority of the industry sectors since 2000 with the exception of Education and Healthcare (25.8 percent), Leisure and Hospitality (28.5 percent), and Other Services (47.7 percent). All other industries are below their 2000 employment levels, with many industries significantly below, including Information (55.1 percent), Manufacturing (21.2 percent), and Professional and Business Services (20.8 percent) (Sussex County 2014).

3.5 DEVELOPMENT TRENDS AND NEW DEVELOPMENT

An understanding of population and development trends can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place to protect human health and community infrastructure. The DMA 2000 requires that communities consider land use trends, which can impact the need for, and priority of, mitigation options over time. Land use and development trends significantly impact exposure and vulnerability to various hazards. For example, significant development in a hazard area increases the building stock and population exposed to that hazard.

Local zoning and planning authority are provided for under the New Jersey Municipal Land Use Law, which gives municipalities zoning and planning authority. Refer to Sections 5 (Capability Assessment) and Section 9 (Jurisdictional Annexes) for further details on the planning and regulatory capabilities for the County and each municipality.

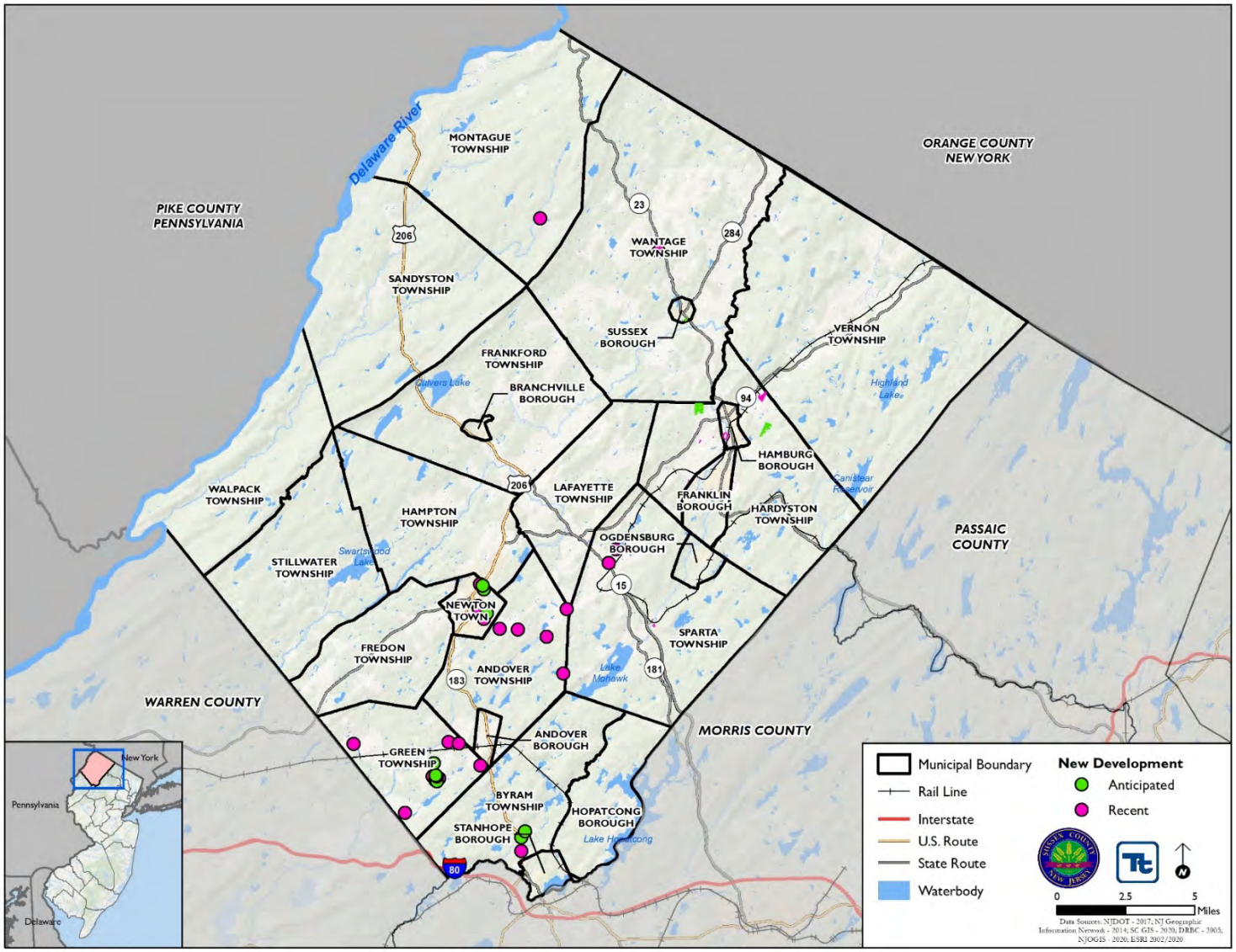
Sussex County is located partially in the New Jersey Highlands Region Preservation Area and partially in the Planning Area. The Highlands Region was officially formed in 2004 to support more regional approaches to land and water conservation, preservation, and management. The Region is found in New Jersey but also neighboring states of New York, Pennsylvania, and Connecticut. The County recognizes the unique value of the Highlands Area and seeks to protect and enhance it while ensuring that land use and development activities occur only in a manner and location that is consistent with the Highlands Regional Master Plan.

The Sussex County Economic Development Partnership (SCEDP) facilitates the recruitment, retention, and expansion of businesses that will complement and be consistent with the character and environment of the County. Additionally, the Sussex County Planning Board is responsible for approving site plan and subdivision applications within their jurisdiction. A development review committee reviews all applications and acts on behalf of the Planning Board.

The New Jersey Highlands Council has identified areas of existing development as well as areas of potential growth that may provide insight as to where potential new development may occur in Sussex County. These areas include the Existing Community Zone (both in-fill of new development and re-development) and Designated Centers; refer to Figure 3-9. The New Jersey Highlands Council assists with planning and considers hazard areas such as floodplains when evaluating new and re-development in the region. In addition, the NJDEP Sewer Service Areas are also shown. These areas show the planned method of wastewater disposal for specific areas, i.e. whether the wastewater will be collected to a regional treatment facility or treated on site and disposed of through a surface water discharge of groundwater discharge.

According to the Sussex County Department of Planning and Economic Development website, there has been a total of 308 permits for new residential buildings from 2015 to 2017 with the largest increase in multi-family use; more recent data is not posted at this time (https://www.sussex.nj.us/documents/planning/residential-building-permits-2010-2017.pdf). New development that has occurred in the last five years within the County and potential future development in the next five years has been identified by each municipality. An exposure analysis was conducted to determine the relationship between the identified potential new development and natural hazard areas evaluated in the HMP update. The results of this spatial analysis have been reviewed with each jurisdiction and are documented in Table 9.X-2 in each jurisdiction annex. In addition, the summary of this analysis and hazard-specific maps are included at the end of each vulnerability assessment (Section 4 – Risk Assessment). Figure 3-9 illustrates the potential new development identified by each jurisdiction, as well as Highlands Existing Community Zones, Designated Centers and Sewer Service Areas which are areas of potential future growth in Sussex County.

Figure 3-11. Areas of Potential Growth and Development in Sussex County



3.6 CRITICAL FACILITIES AND LIFELINES

Critical facilities and infrastructure are necessary for a community's response to and recovery from natural hazard events. Critical facilities include essential facilities, transportation systems, lifeline utility systems, high potential loss facilities and hazardous material facilities. Transportation systems include roadways, bridges, airways, and waterways. Utility systems include potable water, wastewater, oil, natural gas, electric power facilities, and emergency communication systems.

A comprehensive inventory of critical facilities in Sussex County was updated from the 2016 HMP. The Sussex County DEM, Sussex County Division of Planning and individual municipalities provided additional information regarding new, existing, and closed critical facilities.

Critical facilities and infrastructure provide services and functions essential to a community, especially during and after a disaster. As defined for this HMP, critical facilities include essential facilities, transportation systems, lifeline utility systems, high-potential loss facilities and hazardous material facilities.

A ***community lifeline***, a type of critical facility, enables the continuous operation of government functions and critical business and is essential to human health and safety or economic security.

An enhancement to the 2021 HMP was the identification of community lifelines across Sussex County. Sussex County's definition for a lifeline aligns with FEMA: "a type of critical facility that provides indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security." Identifying community lifelines will help government officials and stakeholders to prioritize, sequence, and focus response efforts towards maintaining or restoring the most critical services and infrastructure within their respective jurisdiction(s). Identifying potential impacts to lifelines can help to inform the planning process and determining priorities in the event an emergency occurs; refer to Appendix E for the FEMA fact sheet on lifelines. Overall, there are 590 critical facilities in Sussex County all of which are identified as community lifelines. This inventory is used for the risk assessment in Section 4.

The inventory developed for the HMP update is considered sensitive information. It is protected by the Protected Critical Infrastructure Information (PCII) program and under New Jersey Executive Order 21. Therefore, individual facility names and addresses are not provided in this HMP. A summary of the facility types used for the risk assessment are presented further in this section.

3.6.1 ESSENTIAL FACILITIES

This section provides information on emergency facilities, hospital and medical facilities, schools, shelters, and senior care and living facilities. As stated above, these assets provide indispensable services that need to remain in operation before, during and after natural hazard events. Refer to Section 9 (Jurisdictional Annexes) for mitigation strategies identified by plan participants to reduce future impacts to vulnerable essential facilities and lifelines. Figure 3-11 illustrates the inventory of these essential facilities in Sussex County.

Essential facilities are a subset of critical facilities that include those facilities that are important to ensure a full recovery following the occurrence of a hazard event. For the County risk assessment, this category was defined to include police, fire, EMS, EOCs, schools, shelters, senior facilities and medical facilities.

Emergency Facilities are for the purposes of this Plan, emergency facilities include police, fire, emergency medical services (EMS) and emergency operations centers (EOC).

Emergency Facilities

For the purposes of this HMP, emergency facilities include police, fire, EMS and emergency operations centers (EOC). Sussex County has a highly coordinated and interconnected network of emergency facilities and services at the County and municipal level. The Sussex County Sheriff Department's DEM serves as the primary coordinating agency between local, state and federal agencies. In response to an emergency event, the Division will work with County and municipal health agencies and healthcare providers, emergency facilities and the Sheriff's Department to provide aid to residents of the County.

Each municipality is responsible for maintaining its own fire department with the exception of Walpack Township who has a shared agreement with the Sandyston Township Volunteer Fire Department. Andover Township, Byram Township, Franklin Borough, Hamburg Borough, Hardyston Township, Hopatcong Borough, Newton Town, Ogdensburg Borough, Sparta Township, Stanhope Borough, and Vernon Township all maintain their own police department and provide support to surrounding municipalities. All of the municipalities also maintain their own emergency medical service facilities with the exception of Andover Borough, Branchville Borough, Hamburg Borough, Hampton Township, Sandyston Township, Sussex Borough, and Walpack Township.

Overall, there are 12 enforcement facilities, 65 fire and EMS facilities, and 9 EOCs in Sussex County.

Hospital and Medical Facilities

Sussex County has a dynamic health care industry that includes hospitals, adult day care centers, and long-term care facilities. The two major health centers in the County are Newton Memorial Hospital in Newton Town and Saint Claire's Hospital in Sussex Borough. Additionally, adult care and long-term care facilities are located in Andover Borough, Andover Township, Hampton Township, Hopatcong Borough, Newton Town, and Sparta Township.

Schools

More than 50 schools, ranging from elementary to post-secondary education, service the County. Schools can function as shelters in times of need and are important resource for the community. Several municipalities have their own school systems, while several others are serviced by regional school districts. The primary higher education school in Sussex County is Sussex County Community College in Newton.

There is a total of 54 education facilities located in the County.

Shelters

There were 29 shelters identified within the County during this planning process; many of which are schools, community centers, and municipal buildings.

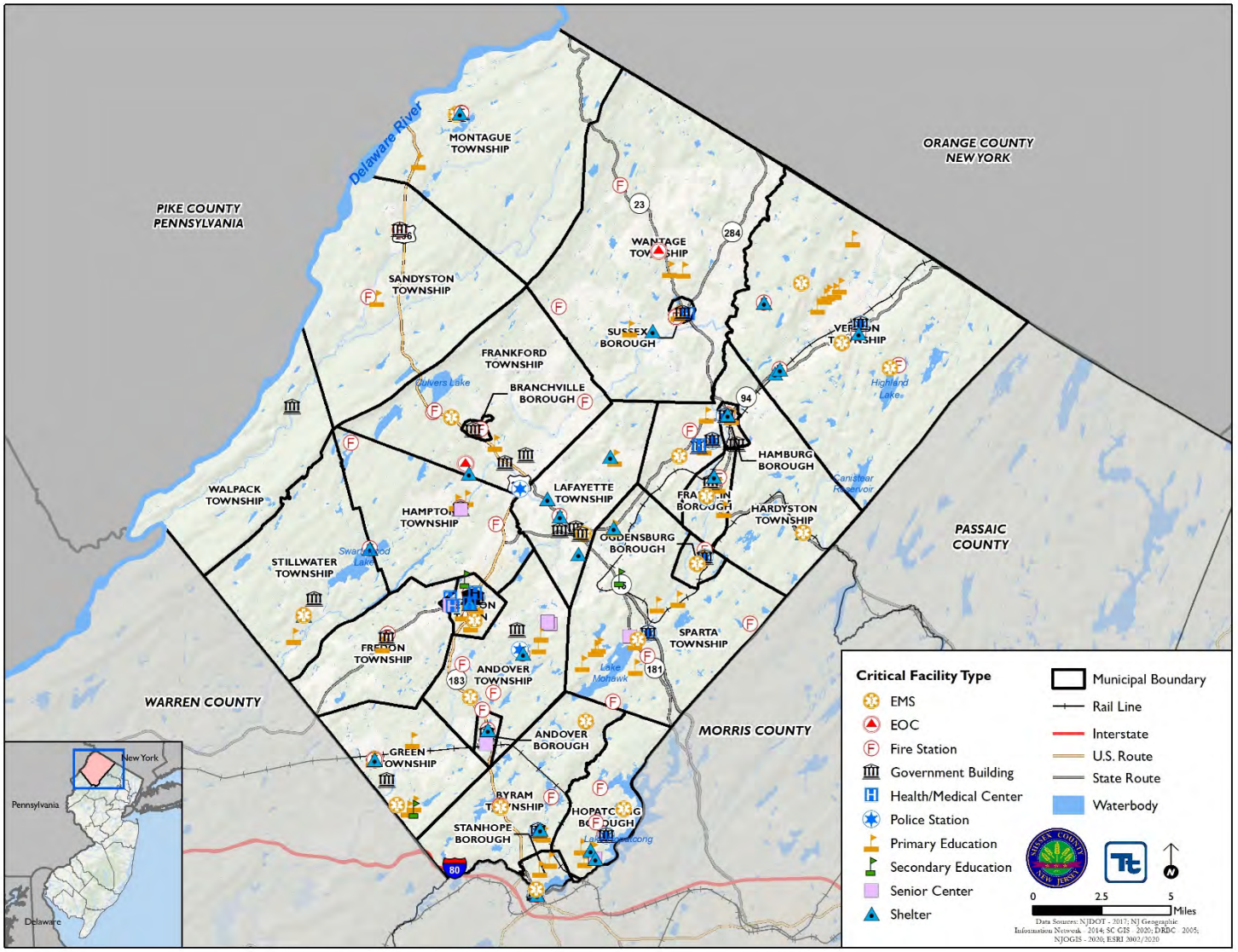
Senior Care and Living Facilities

It is important to identify and account for senior facilities, as they are highly vulnerable to the potential impacts of disasters. Understanding the location and numbers of these types of facilities can help manage effective response plan post disaster. There are seven senior facilities located in the inventory for the risk assessment.

Government Buildings

In addition to the facilities discussed, other County and municipal buildings, and department of public works facilities are essential to the continuity of operations pre-, during and post-disasters. There are 37 additional government facilities located in the County.

Figure 3-12. Essential Facilities in Sussex County



3.6.2 TRANSPORTATION SYSTEMS

One of the County's strongest assets is its transportation infrastructure. Air and land are available and major roadways include Interstate 80, State Routes 15, 23, 94, 181, and 284, and US Route 206. There are three private airports in the County, and 29 bus and park and ride locations. Figure 3-13 illustrates the transportation facilities in Sussex County.

Three organizations provide limited public transportation services within Sussex County, between Sussex County and Morris County, and extended service to Newark and New York. New Jersey Transit (NJ Transit) provides bus service for County residents. Sussex County Transit provides deviated fixed route and demand response service for the general public and paratransit mobility options for elderly or disabled residents. Lakeland Bus Lines, under contract with NJ Transit, provides service between Sussex County and adjacent counties as well as commuter service to Newark and New York. There are also private agencies in the County that provide transportation for their clients who are either elderly or disabled (Sussex County 2005).

Bus Service

The NJ Transit provides bus service to Sussex County residents. The NJ Transit directly operates some of the services that they provide and contracts out to local providers for other services. The NJ Transit provides one bus route in Sussex County through its Wheels program. The Sparta Diamond Express bus provides peak hour service between Sparta Township and Parsippany (Sussex County 2005).

Lakeland Bus Lines, Inc. operates five routes that are available to County residents under contract by the NJ Transit. Two of the five routes are operated inside Sussex County. One is a local circulator and the other is a commuter service to New York City. The other three routes provide commuter service to New York City starting in Dover (Sussex County 2005).

Sussex County Transit provides both fixed route and demand response services in the County. The fixed routes are open to the public but the demand response paratransit service is only available to senior citizens and persons with disabilities (Sussex County 2005).

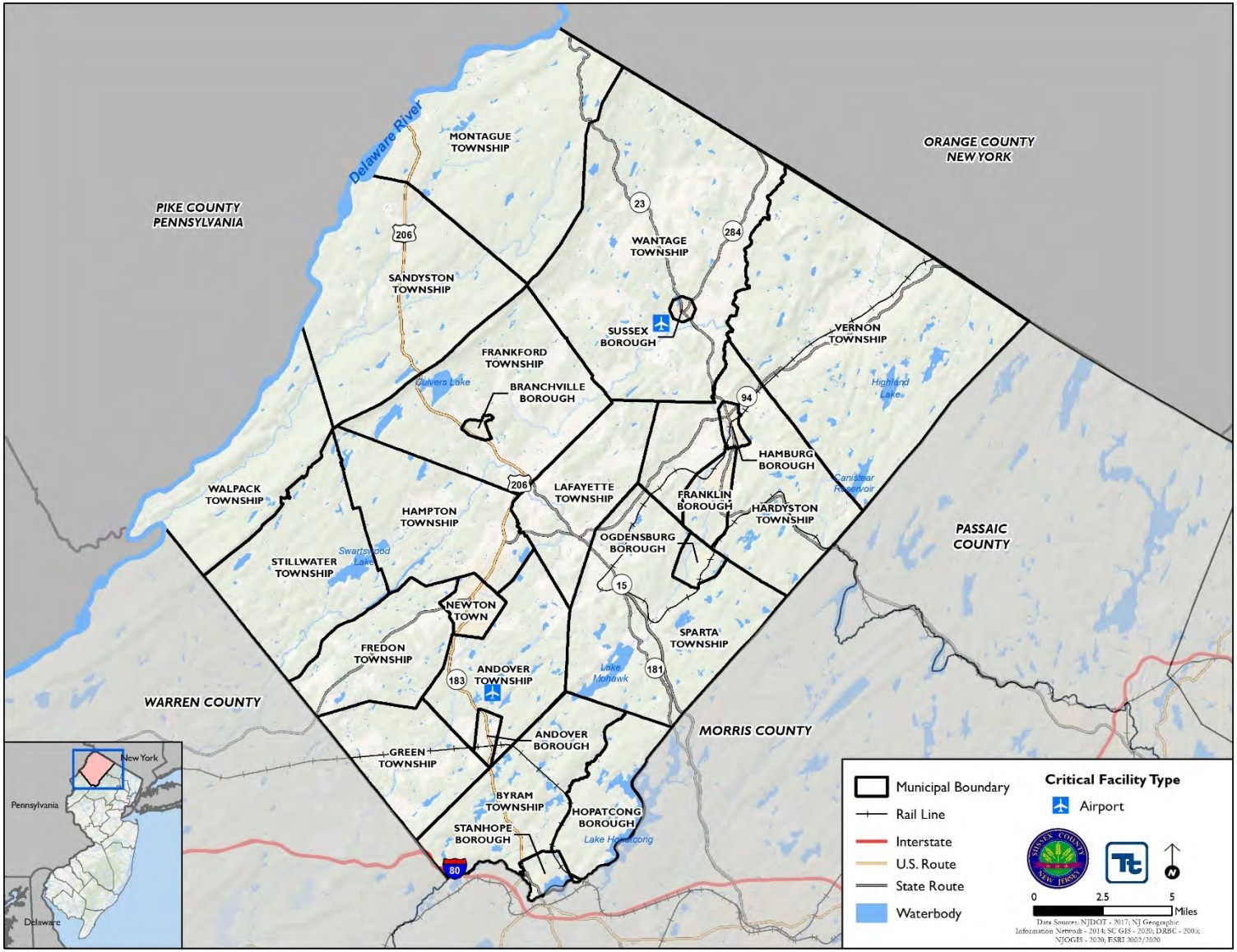
Rail Service

Passenger rail service does not enter Sussex County; residents travel to Morris and Warren Counties to use rail service (Sussex County 2005). The County maintains a freight rail that is operated by regional and short line railroads.

Sussex County Skylands Ride

The Sussex County Skylands Ride is a transportation service that provides five transportation services for Sussex County residents. During the week, the Skylands Connect service runs between the Sussex-Wantage Library and Hampton Township with stops in Hamburg Borough, Franklin Borough, Ogdensburg Borough, Sparta Township, and Newton Town; the Skylands Connect Saturday service is also provided and follows the same route. Skylands New Freedom services is offered on weekdays and runs between the Newton Park & Ride and Netcong train station. Skylands On-Request is provided to senior citizens, veterans, people with disabilities, and residents going to work, school, or training. The Shopper's Service provides scheduled transportation to various stores in the County. Depending on the day, the service is provided to varying communities throughout the County (Sussex County 2020).

Figure 3-13. Transportation Facilities in Sussex County



3.6.3 LIFELINE UTILITY SYSTEMS

This section presents communication, potable water, wastewater, and energy resource utility system data. Due to heightened security concerns, local utility lifeline data sufficient to complete the analysis have only partially been obtained.

Communication

Sussex County has a network of communication facilities and cell towers. These facilities are controlled by both public and private institutions. The County identified six essential communication facilities for the purposes of this plan.

Potable Water

There are community water supply systems in Sussex County that serve municipalities, places with higher density development, and some lake communities. Twenty-one of the County's municipalities are partially or fully served by public water. The Townships of Lafayette, Sandyston, and Walpack do not have public water supply systems (Wastewater Management Plan 2017).

Approximately 95-percent of Sussex County residents rely on groundwater for consumption. It is pumped to County residents from aquifers through either private on-site wells, community wells, or municipal wells (Natural Resources Inventory 2014).

There are five surface water bodies that are used for potable water supply purposes in Sussex County:

- Morris Lake in Sparta Township – used by the Town of Newton
- Lake Rutherford in Wantage Township – used by the Borough of Sussex
- Branchville Reservoir in Frankford Township – used by the Borough of Branchville
- Franklin Pond in the Borough of Franklin – used by the Borough as an emergency water supply
- Lake Hopatcong – used as emergency water supply for several municipalities
- Canistear Reservoir in Vernon Township – located on the Newark water supply management lands
- Heaters Pond in Ogdensburg – used as an emergency water supply

(Natural Resources Inventory 2014).

The County identified ten potable water pumps, two potable water treatment facilities, and 12 wells as critical assets for the purposes of this planning effort.

Wastewater Facilities

The Sussex County Municipal Utilities Authority (SCMUA) operates the largest sewer treatment plant, located in Hardyston Township. The SCMUA also operates other wastewater facilities in the County, including the Hampton Commons facility in Hampton Township. Additionally, the Town of Newton is the owner and operator of its own wastewater treatment plant. The Musconetcong Sewer Authority owns and operates a wastewater treatment plant located in Mount Olive (Morris County), which provides sewer service into Stanhope, Byram, and Hopatcong in Sussex County and portions of Morris County. There are smaller treatment plants located throughout the County that serve schools, commercial, and industrial sites. There are no combined sewers in Sussex County(Wastewater Management Plan 2017).

Table 3-10. Wastewater Districts, Franchise Areas and Municipalities

Wastewater Utility	Municipalities
Sussex County Municipal Utilities Authority	Andover Borough, Andover Twp., Branchville, Frankford, Franklin, Green, Hamburg, Hardyston, Lafayette, Montague, Ogdensburg, Sandyston, Sparta, Stillwater, Sussex, Vernon, Walpack, Wantage
Musconetcong Sewer Authority District	Byram, Hopatcong, Stanhope
Hardyston Township Municipal Utilities Authority	All of Hardyston Township, except Aqua NJ area
Town of Newton	Newton
Aqua NJ – Wallkill (owns Wallkill Sewer Company)	Portion of Hardyston Township
Andover Utility Company Inc.	Portion of Andover Township
Montague Sewer Company (owned by Utilities Inc.)	Portion of Montague
Vernon Township Municipal Utilities Authority	Portion of Vernon Township

Source: Sussex County Wastewater Management Plan 2017

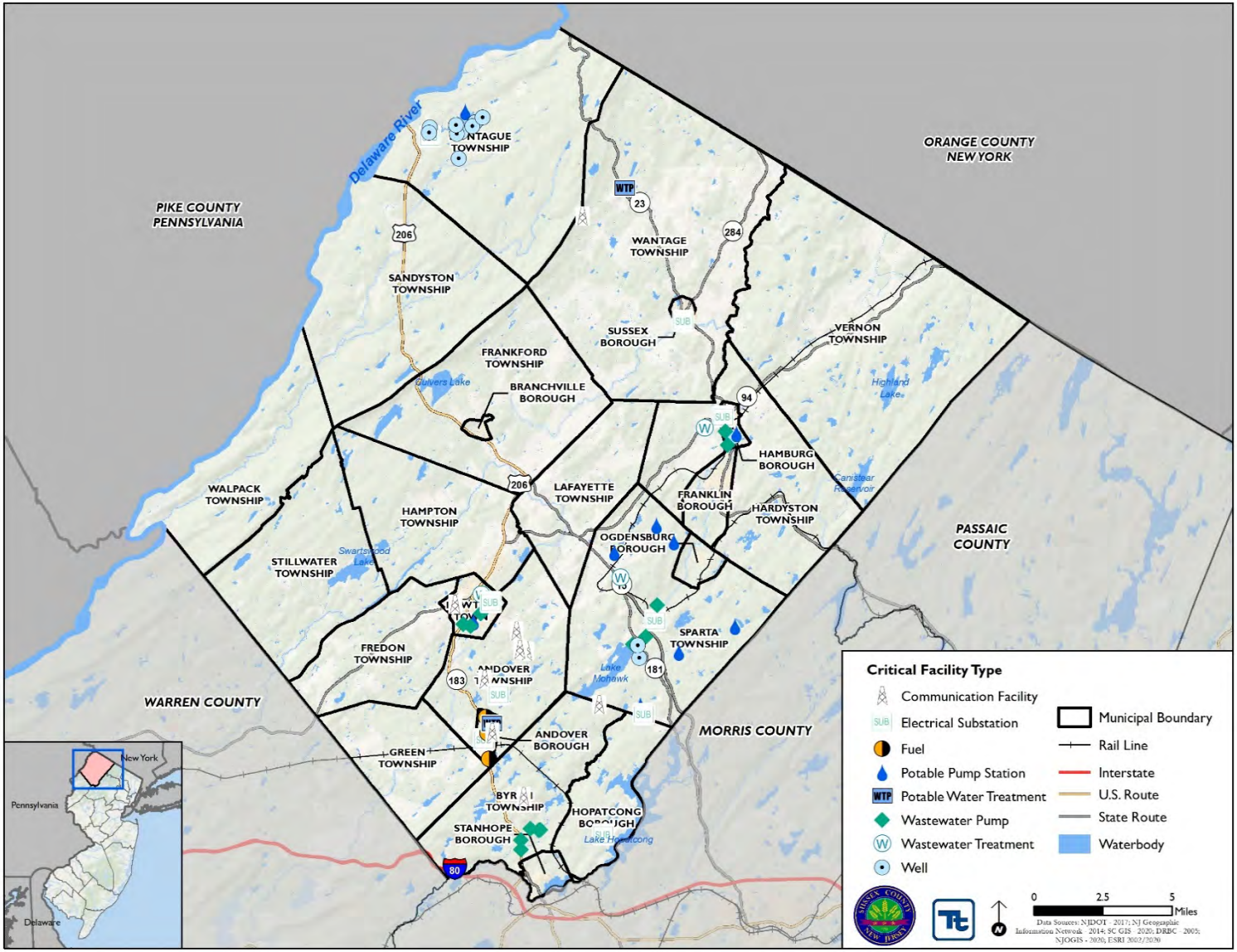
The County identified three wastewater treatment plants and 14 wastewater pump stations identified as critical.

Energy Resources

JCP&L is the primary electric and gas utility company in Sussex County with Sussex Rural Electric Cooperative also providing electric to many of the communities. A portion of the Susquehanna-Roseland line, owned by PSE&G, runs through Fredon, Andover Township, Byram, and Hopatcong in southern Sussex County (PSE&G). There were seven electric substations identified by the County as critical assets.

Figure 3-13 illustrates the general location of the utility lifelines in Sussex County.

Figure 3-14. Utilities in Sussex County



3.6.4 HIGH-POTENTIAL LOSS FACILITIES

High-potential loss facilities include dams and hazardous material sites. Figure 3-15 displays the general locations of dams and hazmat sites in the County and are discussed further below.

According to the NJDEP, there are four hazard classifications of dams in New Jersey. The classifications relate to the potential for property damage and/or loss of life should the dam fail:

- Class I (High-Hazard Potential) - Failure of the dam may result in probable loss of life and/or extensive property damage
- Class II (Significant-Hazard Potential) - Failure of the dam may result in significant property damage; however loss of life is not envisioned.
- Class III (Low-Hazard Potential) - Failure of the dam is not expected to result in loss of life and/or significant property damage.
- Class IV (Small-Dam Low-Hazard Potential) - Failure of the dam is not expected to result in loss of life or significant property damage.

According to the NJDEP Bureau of Dam Safety, there are 239 dams located in Sussex County, 40 of which are classified with a high-hazard potential.

3.6.5 OTHER FACILITIES

The Planning Partnership identified additional facilities (user-defined facilities) as critical. These facilities include one correctional facility, 21 DPW sites, seven food pantries, and three post offices. Figure 3-16 illustrates the general locations of these facilities.

Figure 3-15. High-Potential Loss Facilities in Sussex County

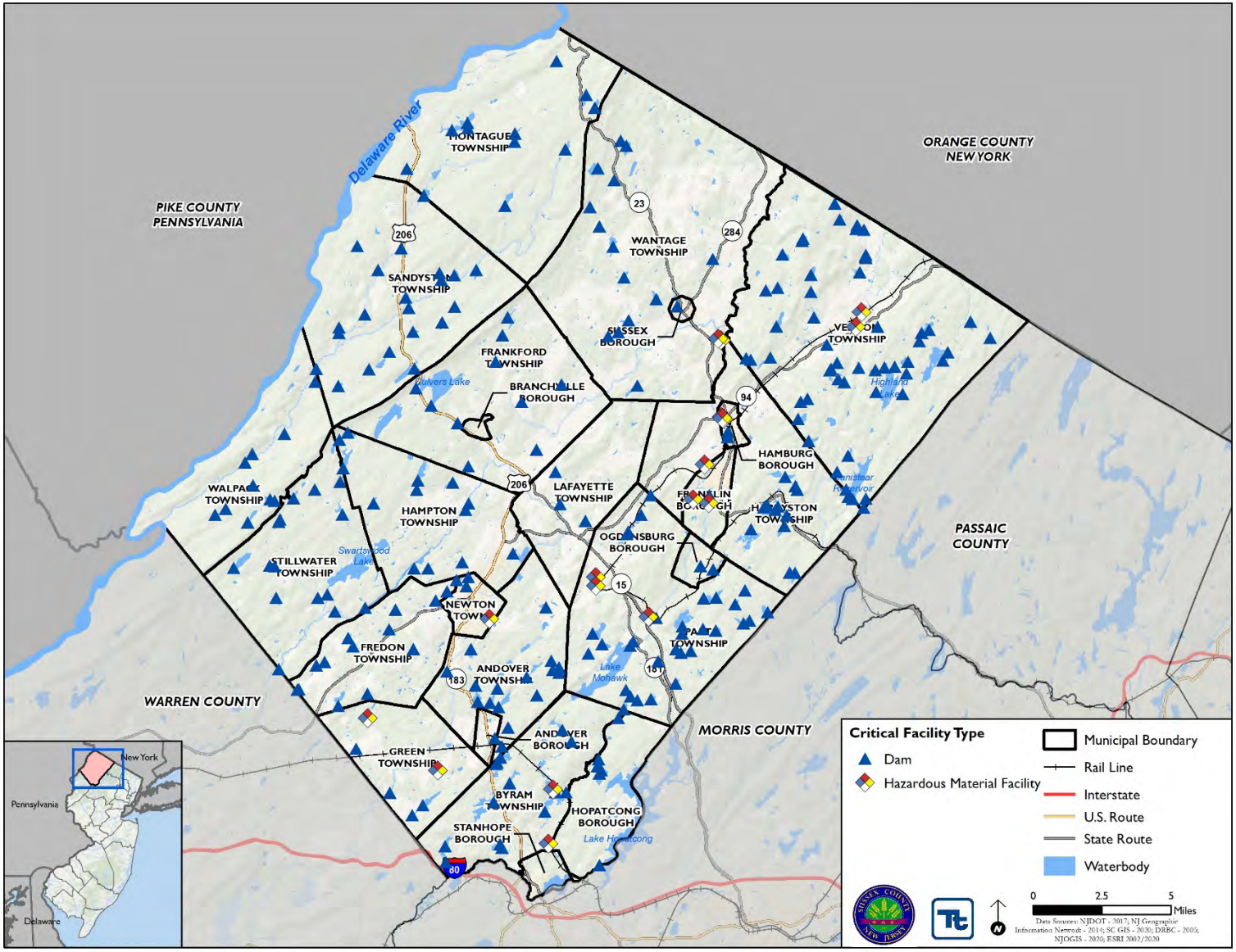
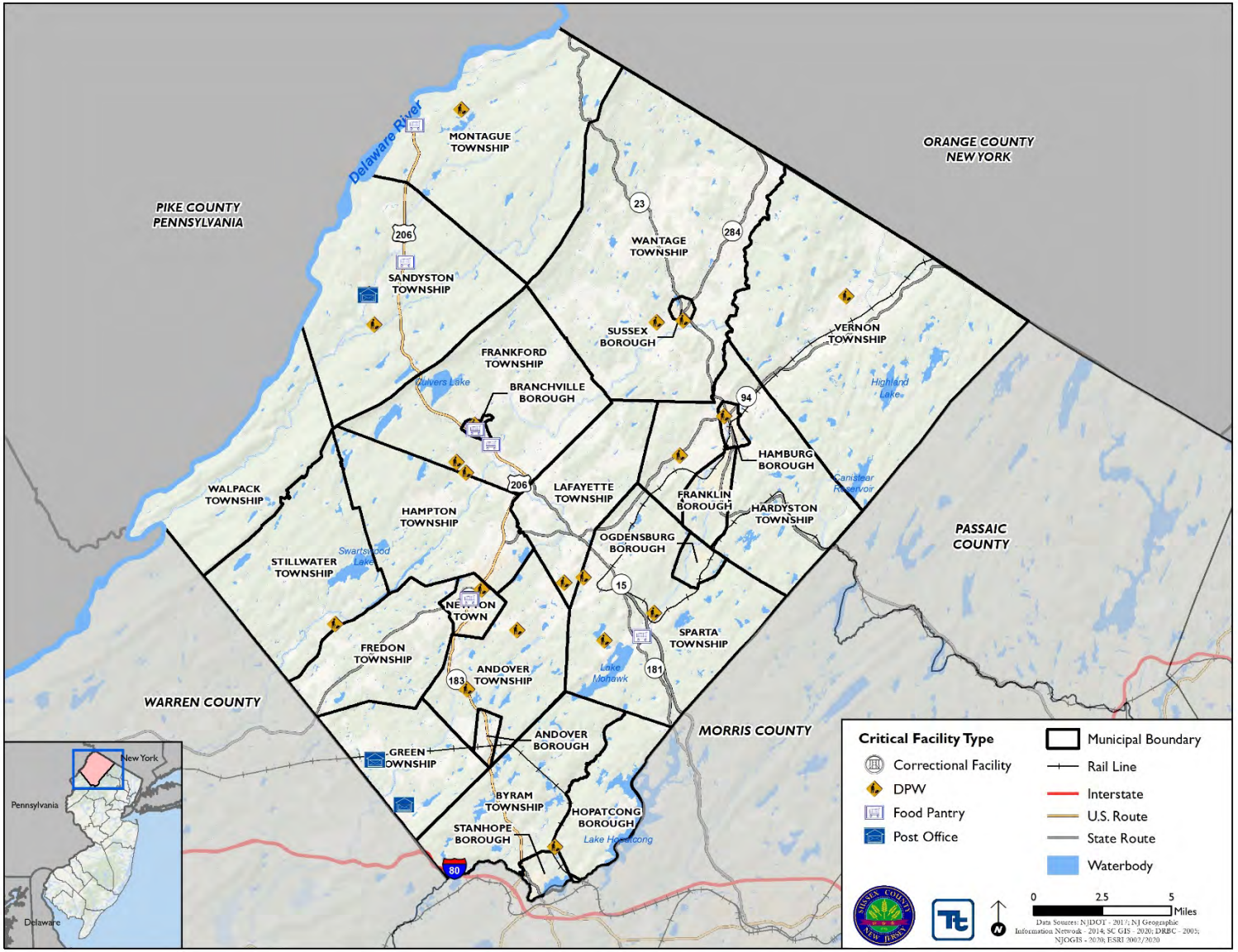


Figure 3-16. Other Critical Facilities in Sussex County



SECTION 4. RISK ASSESSMENT

A risk assessment is the process of measuring the potential loss of life, personal injury, economic and property damage resulting from identified hazards. It allows planning personnel to address and reduce hazard impacts and emergency management personnel to establish early response priorities by identifying potential hazards and vulnerable assets. Results of the risk assessment are used to inform mitigation planning processes, including determining and prioritizing mitigation actions that reduce a community's risk to a specified hazard. Past, present, and future conditions must be evaluated to most accurately assess risk for each jurisdiction. The Sussex County risk assessment is presented in Section 4 and outlined as follows:

- Identification of hazards of concern that impact Sussex County
- Methodology and tools used to conduct the risk assessment
- Hazards of concern profiles and vulnerability assessment
- Hazard ranking

4.1 IDENTIFICATION OF HAZARDS OF CONCERN

2021 HMP Changes

- The 2016 HMP 'Hazard Identification' was presented in subsection 5.2. For the 2021 HMP update, it is presented in subsection 4.1 (Identification of Hazards of Concern).
- The 2021 HMP flood hazard includes increased discussion of urban flooding and two new hazards of concern: disease outbreak and infestation and invasive species.

Hazards of Concern are defined as those hazards that are considered most likely to impact a community. These are identified using available data and local knowledge.

To provide a strong foundation for mitigation strategies considered in Section 6 (Mitigation Strategy) and Section 9 (Jurisdictional Annexes), Sussex County considered a full range of hazards that could impact the area, and then identified and ranked those hazards that presented the greatest concern. The natural hazard of concern identification process incorporated input from the County and participating jurisdictions; review of the State of New Jersey Hazard Mitigation Plan (NJ HMP) and previous hazard identification efforts; research and local, state, and federal information on the frequency, magnitude, and costs associated with the various hazards that have previously, or could feasibly, impact the region; and qualitative or anecdotal information regarding natural hazards and the perceived vulnerability of the study area's assets to them. Table 4.1-1 documents the process of identifying the natural hazards of concern for further profiling and evaluation.

For the purposes of this planning effort, the Planning Partnership chose to group some natural hazards together, based on the similarity of hazard events, their typical concurrence or their impacts, consideration of how hazards have been grouped in FEMA guidance documents (FEMA 386-1, "Understanding Your Risks, Identifying Hazards and Estimating Losses; FEMA's "Multi-Hazard Identification and Risk Assessment – The Cornerstone of the National Mitigation Strategy"), and consideration of hazard grouping in the NJ HMP. With the exception of hazardous substance release (fixed and in-transit), Sussex County chose to focus on natural hazards in this plan as non-natural hazards (technological and intentional hazards) are covered in other local and State plans.

Table 4.1-1. Identification of Natural Hazards of Concern for Sussex County

Hazard	Is this a hazard that may occur in Sussex County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Avalanche	No	No	• The NJ HMP does not identify avalanche as a hazard of concern for New Jersey. • The topography and climate of Sussex County does not support the occurrence of an avalanche event. • New Jersey in general has a very low occurrence of avalanche events based on statistics provided by the American Avalanche Association (AAA) between 1950 and 2014.	• NJ HMP • Review of NAC-AAA database • Steering and Planning Committee Input
Coastal Erosion	No	No	• The NJ HMP identifies coastal erosion as a hazard of concern for New Jersey. Counties bounded by coastal waters are most affected by coastal erosion. • Sussex County is not bounded by coastal waters or located in the Coastal Erosion Hazard Area (CEHA).	• NJ HMP • NOAA • Steering and Planning Committee Input
Coastal Storm	Yes	Yes	See Hurricane and Nor'Easter	
Dam Failure	Yes	Yes	• The NJ HMP identifies dam failure as a hazard of concern for New Jersey. • According to NJDEP, Sussex County has 239 dams (40 high hazard, 41 significant hazard, 158 low hazard).	• NJ HMP • NJ DEP • Steering and Planning Committee Input
Disease Outbreak	Yes	Yes	• The NJ HMP identifies pandemic as a hazard of concern for New Jersey. • According to the NJ HMP, New Jersey's geographic and demographic characteristics make it particularly vulnerable to importation and spread of infectious diseases. All 21 counties in New Jersey have experienced the effects of a pandemic or disease outbreak. • Sussex County has been impacted by mosquito and tick-borne diseases, food-borne illness and most recently the COVID-19 pandemic. • Sussex County was part of a statewide emergency declaration for West Nile Virus in 2000 (EM-3156) and the DR-4488/EM-3451 for COVID-19.	• NJ HMP • FEMA • Steering and Planning Committee Input
Drought	Yes	Yes	• The NJ HMP identifies drought as a hazard of concern for New Jersey. • The drought hazard is a concern for Sussex County because the County's water is supplied by both surface water and groundwater. Surface water supplies are affected more quickly during droughts than groundwater sources. • Nearly 10% of the County's land use is agricultural and agriculture is an important economic sector to plan participants. • The USDA declared an agricultural disaster for Sussex County in 2015 (excessive heat and drought).	• NJ HMP • USGS • NRCC • NOAA • NOAA-NCEI Storm Database • Steering and Planning Committee Input

Hazard	Is this a hazard that may occur in Sussex County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Earthquake	Yes	Yes	• The NJ HMP identifies earthquake as a hazard of concern for New Jersey. Although they are known to occur on a regular basis, records indicate that no major earthquakes have struck the State since the establishment of historical record-keeping (1500's). • Sussex County is located in the Highlands and Valley and Ridge Physiographic Provinces and near the Ramapo Fault line. • Since 2015, there have been two earthquakes in the region that were felt in Sussex County.	• NJ HMP • NJDEP • NJGS • Steering and Planning Committee Input
Expansive Soils	Yes	No	• The NJ HMP does not identify expansive soils as a hazard of concern for New Jersey. • Soils that expand (swell) as they become wet and contract (shrink) as they dry are called expansive soils. This change can cause the ground to move up and down several inches during a cycle of wetting and drying. Expansive soils that are predominately clay minerals have the ability to absorb water. • According to the USGS 1989 Swelling Clays Map of the Conterminous United States, Sussex County soils have slight to moderate swelling potential and in some areas, contain little or no swelling clay. Based on the soil type and no history of expansive soil incidence occurring in the County, expansive soils are not a hazard of concern for Sussex County.	• NJ HMP • USGS 1989 Swelling Clays Map of the Conterminous U.S. • Steering and Planning Committee Input
Extreme Temperature	Yes	Yes	Please see Severe Weather.	
Flood (Riverine, Flash Flooding, and Urban Flooding)	Yes	Yes	• The NJ HMP identifies flooding as a hazard of concern in New Jersey. • Sussex County has 28 NFIP policies and 243 Write-Your-Own policies. • There has been a total of over $1.7 million paid claims in Sussex County. • There are 16 repetitive and severe repetitive loss properties in the County. • A total of 66 facilities identified as lifelines in Sussex County are exposed to the 1-percent annual chance flood hazard event.	• NJ HMP • FEMA • FEMA FIS • NFIP • NOAA-NCEI Storm Database • Steering and Planning Committee Input
Geological Hazards	Yes	Yes	• The NJ HMP identifies geological hazards as a hazard of concern for New Jersey. • There have been historic debris flow, rockfall and rockslide landslide events in Sussex County. • Carbonate rock formations are found in the northern portion of the County which are susceptible to natural subsidence. • The southeastern areas of Sussex County contain numerous abandoned mines.	• NJHMP • NJGWS • NJDEP • Steering and Planning Committee Input

Hazard	Is this a hazard that may occur in Sussex County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
			• Between 2015 and 2020, there have been no identified geological hazard events in Sussex County.	
Hailstorm	Yes	Yes	Please see Severe Weather.	
Hurricane (and other Tropical Cyclones)	Yes	Yes	• The NJ HMP identifies hurricanes/tropical storms as hazards of concern for New Jersey. • Due to its proximity to the Atlantic Ocean, Sussex County is susceptible to hurricanes and tropical storms. • In 2020, two tropical storms came within 65 nautical miles of Sussex County.	• NJ HMP • FEMA • NOAA-NHC • NOAA-NCEI Storm Database • Steering and Planning Committee Input
Ice Storm	Yes	Yes	Please see Severe Winter Weather.	
Infestation and Invasive Species	Yes	Yes	• Sussex County has a diverse landscape with development woven through natural areas. • Pests in Sussex County that compete for natural resources or transmit diseases to humans, livestock and the environment include insects and invasive plants. • Due to large forested areas and the abundance of parkland throughout the County, pests that damage trees have become an increased focus. • Sussex County has experienced harmful algal blooms in the past causing impacts to natural systems and the local economy. • Infestation and invasive species is added as a new hazard of concern to the 2021 HMP update.	• Steering and Planning Committee Input
Land Subsidence	Yes	No	Please see Geological Hazards.	
Landslide	Yes	No	Please see Geological Hazards.	
Nor'Easters	Yes	Yes	• The NJ HMP identifies Nor'Easters as a hazard of concern for New Jersey. • Due to its proximity to the Atlantic Ocean and location geographically, Sussex County is susceptible to Nor'Easters. • Between 2015 and 2020, Sussex County experienced several impactful Nor'Easter events.	• NJ HMP • FEMA • NOAA • NOAA-NCEI Storm Database • Steering and Planning Committee Input
Radon	Yes	No	• Radon is a naturally-occurring radioactive gas, which has always been a part of our environment. It's a natural decay product of uranium and is found in soil everywhere in varying concentrations and is a serious health risk. • The NJ HMP does not identify radon as a hazard of concern for New Jersey.	• NJ HMP

Hazard	Is this a hazard that may occur in Sussex County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
			• The revised building code requires radon control measures be installed for new construction. • Testing is required at time of real estate transactions. • The Sussex County Division of Health has information regarding this hazard posted on their website. https://www.sussex.nj.us/cn/webpage.cfm?tpid=9641 • The Borough of Franklin has information on their municipal website with the radon map and the Radon Awareness Program: http://www.franklinborough.org/. The Mayor of Franklin declared February Radon Awareness Month as noted in their Press Release. • Hampton Township advertises on their website that residents can obtain free radon testing kits at municipal offices: http://www.hamptontownshipnj.info/. In addition, the Township's proclamation identifies January as Radon Awareness Month. • This hazard was not evaluated further in the 2021 HMP.	
Severe Weather (Extreme Temperatures, Windstorms, Thunderstorms, Hail, Lightning, and Tornados)	Yes	Yes	• The NJ HMP identifies severe weather as a hazard of concern for New Jersey. • Severe weather events occur annually in Sussex County causing a range of impacts from property damage, flooding and loss of power. • NOAA's NCEI storm events database indicates that Sussex County was impacted by approximately 45 severe weather events between 2015 and 2020. • The largest hailstone on record for Sussex County was 1.75 inches. • The strongest tornado on record in Sussex County was an EF-2. • The NJ HMP identifies extreme temperature as a hazard of concern for New Jersey as a type of severe weather. • Sussex County has experienced excessive heat and extreme cold temperature events.	• NJ HMP • NOAA – NCEI • FEMA • NJ OEM • ONJSC • Steering and Planning Committee Input
Severe Winter Weather (Heavy Snow, Blizzards, Freezing Rain/Sleet, Ice Storms)	Yes	Yes	• The NJ HMP identifies severe winter weather as a hazard of concern for New Jersey. • Normal seasonal snowfall in Sussex County ranges between 40 to 50 inches. • NOAA-NCEI has indicated that Sussex County has experienced the impacts of 16 severe winter weather events between 2015 and 2020.	• NJ HMP • FEMA • NOAA – NCEI Storm Database • ONJSC • Steering and Planning Committee Input
Tornado	Yes	Yes	Please see Severe Weather.	
Tsunami	No	No	• The NJ HMP does identify tsunami as a hazard of concern for New Jersey. • Sussex County is not bounded by coastal waters; therefore, tsunami is not identified as a hazard of concern.	• NJ HMP • Steering and Planning Committee Input

Hazard	Is this a hazard that may occur in Sussex County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Volcano	No	No	• The NJ HMP does not identify volcano as a hazard of concern for New Jersey.	• NJ HMP
Wildfire	Yes	Yes	• The NJ HMP identifies as wildfire as a hazard of concern for New Jersey. • In Sussex County, nearly 70 square miles are located in the extreme and very high wildfire fuel zones according to the New Jersey Forest Fires Service. • Between 2015 and 2020, there was one wildfire in Sussex County that damaged a home. • Based on input from the Planning Committee, wildfire is considered a hazard of concern for Sussex County due to the large areas of State forests and development proximate to these areas.	• NOAA – NCEI Storm Events Query • USGS • NJ HMP • NJFFS • Steering and Planning Committee Input
Windstorm	Yes	Yes	Please see Severe Weather.	

DIR *Drought Impact Reporter*
DR *Presidential Disaster Declaration Number*
EM *Presidential Disaster Emergency Number*
FEMA *Federal Emergency Management Agency*
HMP *Hazard Mitigation Plan*
K *Thousands ($)*
M *Millions ($)*
NCEI *National Oceanic and Atmospheric Administration National Climatic Data Center*
NJ *New Jersey*
NJDEP *New Jersey Department of Environmental Protection*
NJDOH *New Jersey Department of Health*
NJFFS *New Jersey Forest Fire Service*
NJGS *New Jersey Geological Survey (as part of the NJDEP)*
NOAA *National Oceanic and Atmospheric Administration*
NRCC *Northeast Regional Climate Center*
NWS *National Weather Service*
OEM *Office of Emergency Management*
ONJSC *Office of New Jersey State Climatologist*
SPC *Storm Prediction Center*
USGS *U.S. Geologic Survey*

Table 4.1-2. Identification of Non-Natural Hazards of Concern for Sussex County

Hazard	Is this a hazard that may occur in Sussex County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Hazardous Substances	Yes	Yes	• The NJ HMP identifies hazardous substances as a hazard of concern for New Jersey. • Major highways in the County over which hazardous materials are transported daily include U.S. Route 206 and State Highway 15. • Hazardous substances may also be transported via rail or pipeline in the County. • Between 2015 and 2018, Sussex County had a total of 36,960 pounds of chemicals released on-site (USEPA 2020). • In 2015, a rail accident occurred involving hazardous materials. • The Planning Committee identified hazardous substances as a hazard of concern for Sussex County due to its extensive transportation network and vulnerability to surrounding communities if there is a release.	• NJ HMP • NJ.com • USEPA • PHMSA • Steering and Planning Committee Input

NJ HMP *New Jersey Hazard Mitigation Plan*
PHMSA *Pipeline and Hazardous Materials Safety Administration*
USEPA *United States Environmental Protection Agency*

According to input from the County, and review of all available resources, a total of 12 natural hazards and one human-caused hazards of concern were identified as significant hazards affecting the entire planning area, to be addressed in this plan.

Natural Hazards of Concern:

- Dam Failure
- Disease Outbreak
- Drought
- Earthquake
- Flood (including riverine, flash, urban flooding)
- Geologic (landslide, subsidence, and sinkholes)
- Hurricane and Tropical Storm
- Infestation and Invasive Species
- Nor'Easter
- Severe Weather (High Winds, Tornadoes, Thunderstorms, Hail)
- Severe Winter Weather (Heavy Snow, Blizzards, Ice Storms)
- Wildfire

Human-Caused Hazards of Concern:

- Hazardous Materials (Fixed Sites and Transportation)

There are other natural and human-caused hazard events that have occurred in Sussex County; however, they have a low potential to occur or are covered in other plans that specifically address technological and intentional hazards. Therefore, these hazards will not be further addressed in the 2021 HMP. However, if deemed necessary by the County, these hazards may be considered in future versions of this plan.

4.2 METHODOLOGY AND TOOLS

2021 HMP Changes

The risk assessment was updated using best available information.

- The 2014-2018 American Community Survey (ACS) 5-year Population Estimates were utilized.
- Countywide 2020 parcels, 2018 MOD-IV data, and 2020 RSMeans values were used to develop a structure-level building inventory and estimate replacement cost value for each building.
- The 2016 HMP critical facility inventory was reviewed and updated by the Planning Partnership.
- Community lifelines were identified in the critical facility inventory to align with FEMA's lifeline definition.
- Hazus v4.2 was used to estimate potential impacts to the flood, seismic and wind hazards.

4.2.1 ASSET INVENTORIES

Sussex County assets were identified to assess potential exposure and loss associated with the hazards of concern. For the HMP update, Sussex County assessed exposure and vulnerability of the following types of assets: population, buildings and critical facilities/infrastructure, new development, and the environment. Some assets may be more vulnerable because of their physical characteristics or socioeconomic uses. To protect individual privacy and the security of critical facilities and community lifelines, information on properties assessed is presented in aggregate, without details about specific individual properties.

The risk assessment included the collection and use of an expanded and enhanced asset inventory to estimate hazard exposure and vulnerability

Population

Total population statistics from the 2014-2018 ACS 5-year estimate were used to estimate the exposure and potential impacts to the County's population in place of the 2010 U.S. Census block estimates. Borough, town, and township populations were extracted directly from the ACS. Population counts at the jurisdictional level were averaged among the residential structures in the County to estimate the population at the structure level. This estimate is a more precise distribution of population across the County compared to using the Census block or Census tract boundaries. Limitations of these analyses are recognized, and thus the results are used only to provide a general estimate for planning purposes.

FEMA's Hazus program was used to model estimate potential losses to flood, seismic and wind hazards; as discussed further later in this section. Hazus still contains 2010 U.S. Census data and was used to estimate sheltering and injuries as part of the hazard analysis.

As discussed in Section 3 (County Profile), research has shown that some populations are at greater risk from hazard events because of decreased resources or physical abilities. Vulnerable populations in Sussex County included in the risk assessment are children, elderly, population below the poverty level, non-English speaking individuals, and persons institutionalized with a disability.

Buildings

A custom general building stock was created countywide. To develop the building inventory, updated building footprints provided by Sussex County and parcels from the 2018 MOD-IV tax assessor data obtained from the New Jersey Geographic Information Network Open Data portal were used. Attributes provided in the associated files were used to further define each structure, such as year built, number of stories, basement type, occupancy class, and square footage. The centroid of each building footprint was used to estimate the building location. Structural and content replacement cost values (RCV) were calculated for each building using the available assessor data, the building footprint, and RSMeans 2020 values. The analysis used a location factor of 1.14 and 0.96 for non-residential and residential occupancy classes, respectively. These location factors were associated with the zip-code options for Sussex County. Replacement cost value is the current cost of returning an asset to its pre-damaged condition using present-day cost of labor and materials. Total replacement cost value consists of both the structural cost to replace a building and the estimate value of contents of a building. The occupancy classes available in Hazus were condensed into the categories of residential, commercial, industrial, agricultural, religious, governmental, and educational to facilitate analysis and presentation of results. Residential loss estimates addressed both multi-family and single-family dwellings.

Critical Facilities and Lifelines

*A **lifeline** provides indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security (FEMA).*

The 2016 HMP critical facility inventory was updated using GIS data provided by Sussex County GIS & Mapping Services. The dataset, which includes essential facilities, utilities, transportation features and user-defined facilities as outlined in Section 3, was enhanced with attributes provided within the spatial layers. The inventory was then reviewed by the Planning Partnership allowing for County and municipal input. The update involved a review for accuracy, additions or deletions of new/moved critical assets, identification of backup power for each asset (if known) and the addition of community lifelines in accordance with FEMA's definition; refer to Appendix E (Risk Assessment Supplement). To protect individual privacy and the security of assets, information is presented in aggregate, without details about specific individual properties or facilities.

New Development

In addition to summarizing the current vulnerability, Sussex County examined new development that can affect the planning area's vulnerability to hazards. New development that occurred within the last five years and development that is projected to occur in the next five years were identified by the County and participating municipalities using Survey123; a cloud-based ESRI ArcGIS online platform. Identifying these changes and integrating them into the risk assessment ensures their vulnerability, if any, is considered when developing the mitigation strategy to reduce future risk. An exposure analysis was conducted and the results shared with the plan participants (one tool in the Mitigation Toolbox discussed in Section 6 – Mitigation Strategy). The new development and exposure analysis results are presented in Section 9 (Jurisdictional Annexes), as a table in each annex.

4.2.2 METHODOLOGY

To address the requirements of the DMA 2000 and better understand potential vulnerability and losses associated with hazards of concern, Sussex County used standardized tools, combined with local, state, and federal data and expertise to conduct the risk assessment. Three levels of analysis were used depending on the data available for each hazard as described below. Table 4.2-1 summarizes the type of analysis conducted by hazard of concern.

1. **Historic Occurrences and Qualitative Analysis**—This analysis includes an examination of historic impacts to understand potential impacts of future events of similar size. In addition, potential impacts and losses are discussed qualitatively using best available data and professional judgement.

2. **Exposure Assessment**—This analysis involves overlaying available spatial hazard layers, or hazards with defined extent and locations, with assets in GIS to determine which assets are located in the impact area of the hazard. The analysis highlights which assets might be affected by the hazard. If the center of each asset is located in the hazard area, it is deemed exposed and potentially vulnerable to the hazard.

3. **Loss estimation**—The FEMA Hazus modeling software was used to estimate potential losses for the following hazards: flood, earthquake, and hurricane. In addition, an examination of historic impacts and an exposure assessment was conducted for these spatially-delineated hazards.

Table 4.2-1 Summary of Risk Assessment Analyses

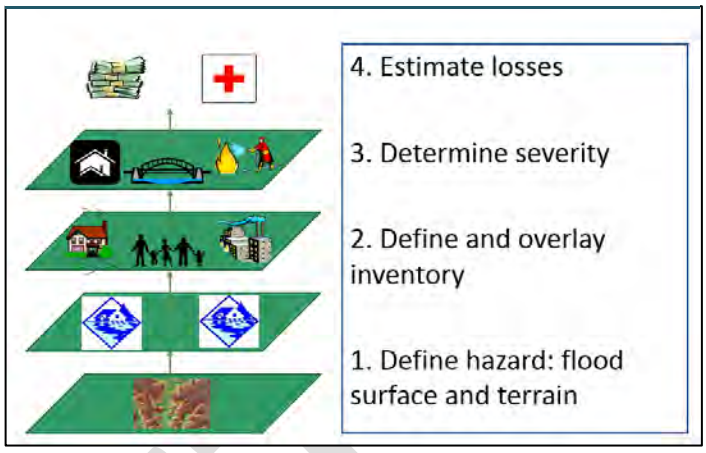
Hazard	Data Analyzed			
	Population	General Building Stock	Critical Facilities	New Development
Dam Failure	Q	Q	Q	Q
Disease Outbreak	Q	Q	Q	Q
Drought	Q	Q	Q	Q
Earthquake	H	H	H	Q
Flood	E, H	E, H	E, H	E
Geological	E	E	E	E
Hazardous Material Release	E	E	E	E
Hurricane and Tropical Storms	H	H	H	Q
Infestation and Invasive Species	Q	Q	Q	Q
Nor'Easter	Q	Q	Q	Q
Severe Weather	Q	Q	Q	Q
Severe Winter Weather	Q	Q	Q	Q
Wildfire	E	E	E	E

Notes: E = Exposure analysis; H = Hazus analysis; Q = Qualitative analysis

Hazards U.S. – Multi-Hazard (Hazus)

In 1997, FEMA developed a standardized model for estimating losses caused by earthquakes, known as Hazards U.S. or Hazus. Hazus was developed in response to the need for more effective national-, state-, and community-level planning and for identification of areas that face the highest risk and potential for loss. Hazus was expanded into a multi-hazard methodology, Hazus, with new models for estimating potential losses from wind (severe storms) and flood (riverine) hazards. Hazus is a Geographic Information System (GIS)-based software tool that applies engineering and scientific risk calculations, which have been developed by hazard and information technology experts, to provide defensible damage and loss estimates. These methodologies are accepted by FEMA and provide a consistent framework for assessing risk across a variety of hazards. The GIS framework also supports the evaluation of hazards and assessment of inventory and loss estimates for these hazards.

Hazus – How it works



Hazus uses GIS technology to produce damage reports, detailed maps and analytical reports that estimate a community's direct physical damage to building stock, critical facilities, transportation systems, and utility systems. To generate this information, Hazus uses default Hazus provided data for inventory, vulnerability, and hazards. This default data can be supplemented with local data to provide a more refined analysis. Damage reports can include induced damage (inundation, fire, threats posed by hazardous materials and debris) and direct economic and social losses (casualties, shelter requirements, economic impact) depending on the hazard and available local data. Hazus' open data architecture can be used to manage community GIS data in a central location. The use of this software also promotes consistency of data output now and in the future and standardization of data collection and storage. More information on Hazus is available at http://www.fema.gov/hazus.

In general, probabilistic analyses were performed to develop expected and estimated distribution of losses (mean return period losses) for the flood, seismic and wind hazards. The probabilistic model generates estimated damages and losses for specified return periods (e.g., 100- and 500-year). Table 4.2-2 displays the various levels of analyses that can be conducted using the Hazus software.

Table 4.2-2. Summary of Hazus Analysis Levels

Hazus Analysis Levels	
Level 1	Hazus provided hazard and inventory data with minimal outside data collection or mapping.
Level 2	Analysis involves augmenting the Hazus provided hazard and inventory data with more recent or detailed data for the study region, referred to as *local data*.
Level 3	Analysis involves adjusting the built-in loss estimation models used for the hazard loss analyses and is typically done in conjunction with the use of local data.

Dam Failure

A qualitative analysis was conducted for the dam failure hazard. The dam classifications and their status were obtained from NJDEP. For security reasons, these asset locations and downstream inundation due to a failure are not displayed on maps or discussed in this plan.

Disease Outbreak

A qualitative analysis was conducted using data from the County's COVID-19 resource website and research from the Centers for Disease Control and Prevention to review the County's risk to illnesses, including the most recent COVID-19 outbreak.

Drought

A qualitative analysis was conducted for the drought hazard. The United States Department of Agriculture (USDA) Census of Agriculture 2017 was used to estimate economic impacts. Information regarding the number of farms and farmland area was extracted from the report and summarized in the vulnerability assessment. Additional resources from the 2019 NJ HMP, NJDEP and the National Drought Mitigation Center (NDMC) were used to assess the potential impacts to the population from a drought event.

Earthquake

A probabilistic assessment was conducted for Sussex County for the 100- and 500-year mean return period (MRPs) events through a Level 2 analysis in Hazus to analyze the earthquake hazard and provide a range of loss estimates. The probabilistic method uses information from historic earthquakes and inferred faults, locations and magnitudes, and computes the probable ground shaking levels that may be experienced during a recurrence period by Census tract.

As noted in the Hazus Earthquake User Manual, "*Although the software offers users the opportunity to prepare comprehensive loss estimates, it should be recognized that uncertainties are inherent in any estimation methodology, even with state-of-the-art techniques. Any region or city studied will have an enormous variety of buildings and facilities of different sizes, shapes, and structural systems that have been constructed over a range of years under diverse seismic design codes. There are a variety of components that contribute to transportation and utility system damage estimations. These components can have differing seismic resistance."* However, Hazus' potential loss estimates are acceptable for the purposes of this HMP.

Groundwater was set at a depth of five (5) feet (default setting). The default assumption is a magnitude 7.0 earthquake for all return periods. In 2012, the NJDOT published a map of zip-codes in New Jersey and their associated soil classification. The soil classification system ranges from A to E, where A represents hard rock that reduces ground motions from an earthquake and E represents soft soils that amplify and magnify ground shaking and increase building damage and losses. These are referred to as National Earthquake Hazard Reductions Program (NEHRP) soils. The NJDOT map indicates Sussex County contains Class C and D soils. An associated soil layer with Class C and D soils was imported into Hazus to inform the seismic model.

Damage estimates are calculated for losses to buildings (structural and non-structural) and contents; structural losses include load carrying components of the structure, and non-structural losses include those to architectural, mechanical, and electrical components of the structure, such as nonbearing walls, veneer and finishes, HVAC systems, boils, etc. Although damages are estimated at the Census tract level, results were presented at the municipal level. Since there are multiple Census tracts that contain more than one jurisdiction, an area analysis was used to extract the percent of each tract that falls within individual jurisdictions. The percentage was multiplied against the results calculated for each tract and summed for each jurisdiction. For example, two municipalities are located within one census tract. The total replacement cost value of Municipality A is 90% of the total census tract replacement cost value, while Municipality B is 10% of the total value. Therefore, 90% of the losses for the census tract will be applied to Municipality A, and 10% will be applied to Municipality B.

Flood

The 1- and 0.2-percent annual chance flood events were examined to evaluate Sussex County's risk to the flood hazard. These flood events are generally those considered by planners and evaluated under federal programs such as the NFIP.

The following data was used to evaluate exposure and determine potential future losses:

- The effective Sussex County FEMA Digital Flood Insurance Rate Maps (DFIRMs) dated September 2011.
- The 1-percent annual chance flood depth grid generated for the 2016 Sussex County HMP which was generated using a DEM from the NJ Office of Information Technology and the base flood and cross-section elevations for the detailed study areas. The depth grid was integrated into the Hazus riverine flood model used to estimate potential losses for the 1-percent annual chance flood event.

To estimate exposure to the 1-percent- and 0.2-percent annual chance flood events, the asset inventories (population, building stock, critical facilities, and new development) were overlaid on the 2011 DFIRM. Asset centroids that intersected the flood boundaries were totaled to estimate the building replacement cost value and population located in the FEMA delineated floodplain.

A Level 2 Hazus riverine flood analysis was performed to estimate potential future loss. Both the critical facility and building inventories were formatted to be compatible with Hazus and its Comprehensive Data Management System (CDMS) and integrated into Hazus. The Hazus riverine flood model was run to estimate potential losses in Sussex County for the 1-percent annual chance flood event. A user-defined analysis was also performed for the building stock. Buildings located in the floodplain were imported as user-defined facilities to estimate potential losses at the structural level. Hazus calculated the estimated potential losses to the population (default 2010 U.S. Census data across dasymetric blocks), potential damages to the general building stock, and potential damages to critical facility inventories based on the depth grids generated and the default Hazus damage functions in the flood model.

Geological

An exposure assessment was conducted using steep slope and carbonate layers to determine the County's risk to the geologic hazard. Steep slopes are an indication of where slides may occur and carbonate soils may be prone to subsidence. Based on the Highlands NJ Council's Steep Slope Protection Area classifications, steep slopes are considered to be greater than 15-percent. A steep slope layer was created using NJ DEP contour lines layer. The surface slope was calculated between the contour lines and slopes greater than 15-percent were selected. To determine what assets are exposed to steep slopes and carbonate rock, the County's assets were overlaid with these hazard areas. Assets with their centroid located in the hazard area(s) were totaled to estimate the number (or count) and replacement cost values exposed to a hazard event.

Resources from the New Jersey Geological and Water Survey and 2014 US Geological Survey (USGS) were also referenced to assess potential impacts to the County.

Hazardous Material Release

An exposure analysis was conducted for the County's assets (population, building stock, critical facilities, and new development) using a radius around potential HazMat incident sites as follows: exposure within one mile of 2019 NJDOT railways, exposure within one mile of 2020 EPA Superfund and TRI Sites, and within 50-miles of the Indian Point Energy Center in New York State. Assets with their centroid located in the hazard area were totaled to estimate the totals and values potentially vulnerable if a hazardous materials release should occur.

Hurricane/Severe Storm

A Hazus analysis was performed to analyze the potential future wind losses associated with the 100- and 500-year MRP events. The probabilistic Hazus hurricane model activates a database of thousands of potential storms that have tracks and intensities reflecting the full spectrum of Atlantic hurricanes observed since 1886 and identifies those with tracks associated with Sussex County. Hazus contains data on historic hurricane events and wind speeds. It also includes surface roughness and vegetation (tree coverage) maps for the area. Surface roughness and vegetation data support the modeling of wind force across various types of land surfaces. Default demographic and updated building and critical facility inventories in Hazus were used for the analysis. Although damages are estimated at the census tract level, results were presented at the municipal level. Since there are multiple census tracts that contain more than one jurisdiction, a density analysis was used to extract the percent of building structures that fall within each tract and jurisdiction. The percentage was multiplied against the results calculated for each tract and summed for each jurisdiction.

Infestations and Invasive Species

A qualitative assessment was conducted to analyze infestation and invasive species on the County. Resources from the USDA Forest Service, New Jersey Department of Agriculture, and NJDEP were referenced to assess the potential impacts to the County's assets.

Nor'Easter

A qualitative assessment was conducted for the Nor'Easter hazard. The Hazus model's wind speeds and associated losses may be used as a reference for Nor'Easter wind impacts. Research from the National Weather Service, National Climatic Data Center, and Office of the New Jersey State Climatologist were used to assess the nature of Nor'Easters and their impact on the County.

Severe Storm

A qualitative assessment was performed to analyze the impacts of severe storm events. Data and studies from the Storm Prediction Center, FEMA, and National Weather Service were analyzed in order to measure the vulnerability of the County to thunderstorms, lightning, hailstorms, windstorms, tornadoes, and extreme temperatures.

Severe Winter Storm

All of Sussex County is exposed and vulnerable to the winter storm hazard. In general, structural impacts include damage to roofs and building frames, rather than building content. Current modeling tools are not available to estimate specific losses for this hazard. A percentage of the custom-building stock structural replacement cost value was utilized to estimate damages that could result from winter storm conditions (i.e., 1-percent, 5-percent, and 10-percent of total replacement cost value). Given professional knowledge and currently available information, the potential losses for this hazard are considered to be overestimated; hence, providing a conservative estimate for losses associated with winter storm events.

Wildfire

The NJFFS uses Wildfire Fuel Hazard data to assign wildfire fuel hazard rankings across the State. This data, developed in 2009, is based upon NJDEP's 2002 Land Use/Land Cover datasets and NJDEP's 2002 10-meter Digital Elevation Grid datasets. For the wildfire hazard, the NJFFS Wildfire Fuel Hazard "extreme', 'very high' and 'high' areas are identified as the wildfire hazard area. The defined hazard area was overlaid upon the asset data (population, building stock, critical facilities and potential new development) to estimate the exposure to each hazard.

Asset data (population, building stock, critical facilities, and new development) were used to support an evaluation of assets exposed and potential impacts and losses associated with this hazard. To determine what assets are exposed to wildfire, the County's assets were overlaid with the hazard area. Assets with their centroid located in the hazard area were totaled to estimate the totals and values exposed to a wildfire event.

Considerations for Mitigation and Next Steps

- All Hazards
  - Create an updated user-defined general building stock dataset using up-to-date parcels, footprints, and RS Means values.
  - Utilize updated and current demographic data. If 2020 U.S. Census demographic data is available at the U.S. Census block level during the next plan update, use the census block estimates and residential structures for a more precise distribution of population, or the current American Community Survey 5-Year Estimate populations counts at the Census tract level.
- Dam Failure
  - Utilize dam failure inundation areas to estimate potential losses.
- Disease Outbreak
  - As more information has been collected about COVID-19, future assessments should consider adding in an evaluation of how the County responded to the pandemic, identify critical facilities with vulnerabilities/limitations to respond effectively, and major transit routes connecting the community to facilities that help treat or vaccinate patients impacted by the pandemic.
- Earthquake
  - Gather more detailed NEHRP soil data to perform an earthquake exposure analysis
  - Identify unreinforced masonry in critical facilities and privately-owned buildings (i.e., residences) by accessing local knowledge, tax assessor information, and/or pictometry/orthophotos. These buildings may not withstand earthquakes of certain magnitudes and plans to provide emergency response/recovery efforts at these properties can be developed.
- Extreme Temperature
  - Track extreme temperature data for injuries, deaths, shelter needs, pipe freezing, agricultural losses, and other impacts to determine distributions of most at risk areas.
- Flood
  - The general building stock inventory can be updated to include attributes regarding first floor elevation and foundation type (basement, slab on grade, etc.) to enhance loss estimates.
  - Conduct a Hazus loss analysis for more frequent flood events (e.g., 10 and 50-year flood events).
  - Continue to expand and update urban flood areas to further inform mitigation.
  - As more current FEMA floodplain data become available (i.e., DFIRMs), update the exposure analysis and generate a more detailed flood depth grid that can be integrated into the current Hazus version.
- Geological Hazards
  - A pilot study conducted in Schenectady County, NY (Landslide Susceptibility – A Pilot Study of Schenectady County, NY) provided a detailed methodology for delineating high-risk landslide areas. This study looked at a variety of environmental characteristics including slope and soil conditions to determine areas at risk to landslide. To coincide with the methodology of that study, the generated slopes were categorized into five classes: 0%-2%; 3%-7%; 8%-15%; 16%-25%; Greater than 25%. Should the County determine the need for a more detailed assessment of risk, it could determine steep slope by other percent categorizations. Additional

environmental and soil characteristics used in the Schenectady County plan can be collected and used to follow the methodology used to further delineate the County's most at risk areas.

- Hurricane
  - General building stock inventory can be updated to include attributes regarding protections against strong winds, such as hurricane straps, to enhance loss estimates.
- Severe Winter Storm
  - If available for the region, obtain average snowfall distributions to determine if various areas in the County have historically received higher snowfalls and may continue to be more susceptible to higher snowfalls and snow loads on the building stock and critical facilities and infrastructure.
- Wildfire
  - General building stock inventory can be updated to include attributes such as roofing material or fire detection equipment.

4.2.3 DATA SOURCE SUMMARY

Table 4.2-3 summarizes the data sources used for the risk assessment for this plan.

Table 4.2-3. Risk Assessment Data Documentation

Data	Source	Date	Format
Population data	U.S. Census Bureau; American Community Survey 5-Year Estimates	2010; 2014-2018	Digital (GIS) format
Building Inventory	Sussex Parcel Data, MOD-IV, Tetra Tech	2020; 2018	Digital (GIS) format
Critical facilities	Sussex Planning Partnership and County Jurisdictions	2020	Digital (GIS) format
Digitized Effective FIRM maps	FEMA	2011	Digital (GIS) format
Digital Elevation Model	NJOIT	2014	Digital (GIS) format
Road and Rail Network	NJDOT	2017; 2019	Digital (GIS) format
Carbonate Hazard Area	USGS	2014	Digital (GIS) format
EPA Superfund and TRI Sites	US EPA	2020	Digital (GIS) format
New Development Data	Sussex County Planning Partnership	2020	Digital (GIS) Format
Wildfire Fuel Hazard	NJDEP/NJFFS	2009	Digital (GIS) format
NEHRP soils by zip-code	NJDOT	2012	Image
Depth Grid	New Jersey State HMP	2014	Digital (GIS) format
Contour Lines	USGS/NJ DEP	1999	USGS Line Graphs converted by NJ DEP to Digital (GIS) format

DEP *Department of Environmental Protection*
DFIRM *Digital Flood Insurance Rate Map*
EPA *Environmental Protection Agency*
FEMA *Federal Emergency Management Agency*
FIRM *Flood Insurance Rate Map*
GIS *Geographic Information System*
NJDEP *New Jersey Department of Environmental Protection*
NJDOT *New Jersey Department of Transportation*
NJFFS *New Jersey Forest Fire Service*
NJOIT *New Jersey Office of Information Technology*
USDA *United States Department of Agriculture*
USGS *United States Geological Survey*

Limitations

For this risk assessment, the loss estimates, exposure assessments, and hazard-specific vulnerability evaluations rely on the best-available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from the following:

1) Approximations and simplifications necessary to conduct such a study.
2) Incomplete or dated inventory, demographic, or economic parameter data.
3) The unique nature, geographic extent, and severity of each hazard.
4) Mitigation measures already employed by the participating municipalities.
5) The amount of advance notice residents have to prepare for a specific hazard event.

These factors can result in a range of uncertainty in loss estimates, possibly by a factor of two or more; therefore, potential exposure and loss estimates are approximate. These results do not predict precise results and should be used to understand relative risk. Over the long term to assist in estimating potential losses, Sussex County will collect additional data and update and refine existing inventories.

Potential economic loss is based on the present value of the general building stock using best-available data. The county acknowledges significant impacts can occur to critical facilities and infrastructure as a result of these hazard events, causing great economic loss. However, monetized damage estimates to critical facilities and infrastructure, as well as economic impacts were not quantified and require more detailed loss analyses. In addition, economic impacts to industry, such as tourism and the real-estate market, were not analyzed.

4.3 HAZARDS OF CONCERN

The Sussex County hazards of concern are presented in Section 4.3 and outlined as follows:

- **Hazard Profile**
  - Location - geographic area most affected by the hazard
  - Extent – severity of each hazard
  - Previous Occurrences and Losses
  - Impacts of Climate Change
  - Probability of Future Hazard Events
- **Vulnerability Assessment**
  - Impact to Life, Health and Safety
  - Impact to the General Building Stock
  - Impact to Critical Facilities and Lifelines
  - Impact to the Economy
  - Impact to the Environment
  - Future Changes that may Impact Vulnerability
  - Change of Vulnerability Since the 2016 HMP

4.3.1 DAM FAILURE

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the dam failure hazard in Sussex County.

2021 HMP Changes

- All subsections have been updated using best available data.
- Previous occurrences were updated with events that occurred between 2015 and 2020.

Profile

Hazard Description

A dam or a levee is 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 (FEMA 2007). Dams are man-made structures built across a stream or river that impound water and reduce the flow downstream (FEMA 2003). They are built for the purpose of power production, agriculture, water supply, recreation, and flood protection. Dam failure is any malfunction or abnormality outside of the design that adversely affects a dam's primary function of impounding water (FEMA 2007). Levees typically are earthen embankments constructed from a variety of materials ranging from cohesive to cohesionless soils. Dams and levees can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam or levee (inadequate spillway capacity);
- Prolonged periods of rainfall and flooding;
- Deliberate acts of sabotage (terrorism);
- Structural failure of materials used in dam construction;
- Movement and/or failure of the foundation supporting the dam;
- Settlement and cracking of concrete or embankment dams;
- Piping and internal erosion of soil in embankment dams;

- Inadequate or negligent operation, maintenance and upkeep;
- Failure of upstream dams on the same waterway; or
- Earthquake (liquefaction / landslides) (FEMA 2018).

Regulatory Oversight of Dams

Potential for catastrophic flooding caused by dam failures led to enactment of the National Dam Safety Act (Public Law 92-367), which for 30 years has protected Americans from dam failures. The National Dam Safety Program (NDSP) is a partnership among states, federal agencies, and other stakeholders that encourages individual and community responsibility for dam safety. Under FEMA's leadership, state assistance funds have allowed all participating states to improve their programs through increased inspections, emergency action planning, and purchases of needed equipment. FEMA has also expanded existing and initiated new training programs. Grant assistance from FEMA provides support for improvement of dam safety programs that regulate most dams in the United States (FEMA 2016).

U.S. Army Corps of Engineers Dam Safety Program

The U.S. Army Corps of Engineers (USACE) is responsible for safety inspections of some federal and non-federal dams in the United States that meet the size and storage limitations specified in the National Dam Safety Act. USACE has inventoried dams and has surveyed each state's and federal agency's capabilities, practices, and regulations regarding design, construction, operation, and maintenance of the dams. USACE has also developed guidelines for inspection and evaluation of dam safety (USACE 2019).

Federal Energy Regulatory Commission Dam Safety Program

The Federal Energy Regulatory Commission (FERC) has the largest dam safety program in the United States. FERC cooperates with a large number of federal and state agencies to ensure and promote dam safety and, more recently, homeland security. A total of 3,036 dams are part of regulated hydroelectric projects and are included in the FERC program. Two-thirds of these dams are more than 50 years old. Concern about their safety and integrity grows as dams age, rendering oversight and regular inspection especially important (FERC 2017). FERC staff inspect hydroelectric projects on an unscheduled basis to investigate the following:

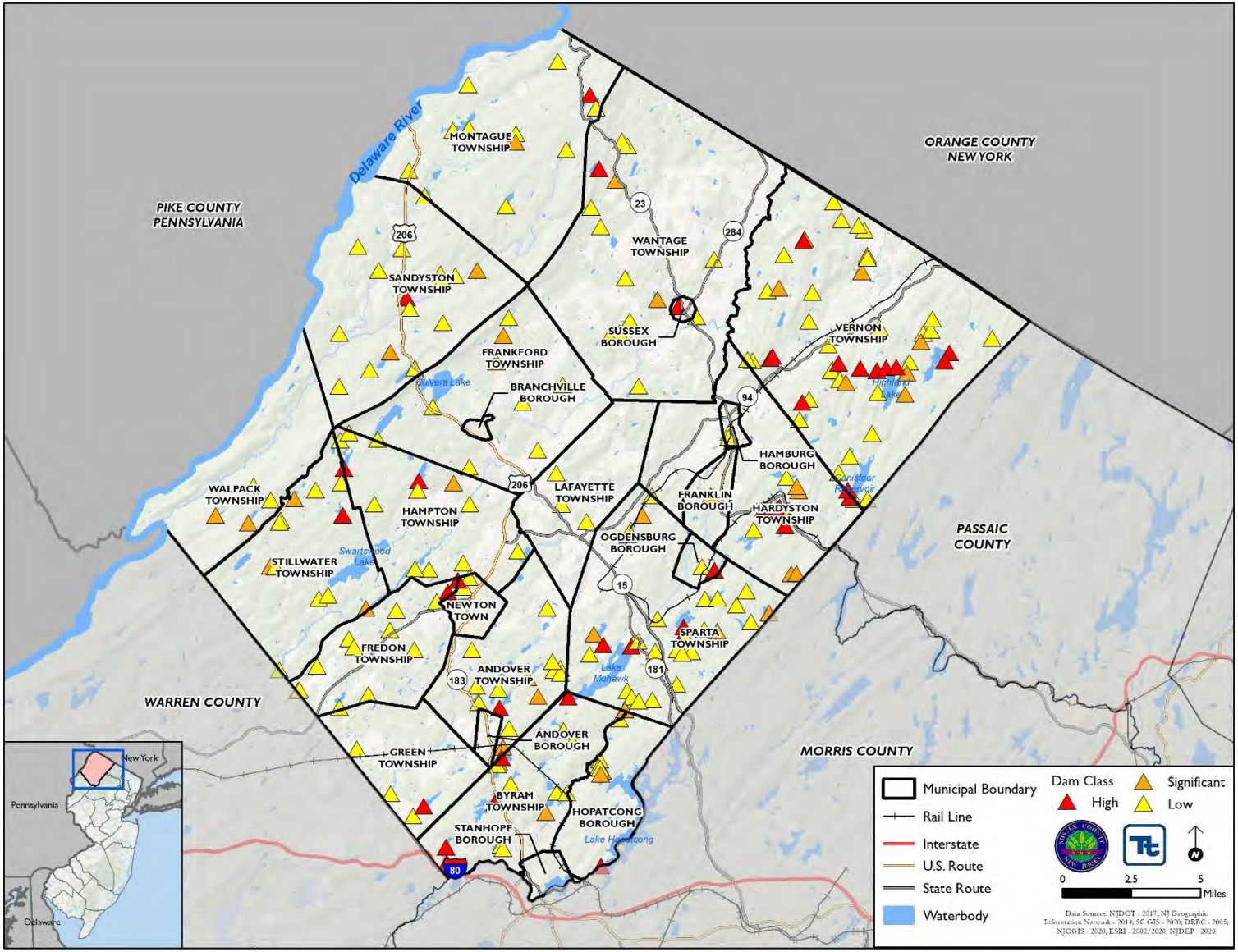
- Potential dam safety problems
- Complaints about constructing and operating a project
- Safety concerns related to natural disasters
- Issues concerning compliance with terms and conditions of a license (FERC 2017).

Every 5 years, an independent consulting engineer, approved by FERC, must inspect and evaluate projects with dams higher than 32.8 feet (10 meters) or with total storage capacity of more than 2,000 acre-feet (FERC 2017).

Location

According to NJDEP, Sussex County has 239 dams. Of these dams, 40 are considered high hazard, 41 are considered significant hazard, and 158 are considered low hazard. There are 41 dams classified as in a poor state of repair with one dam in an unsatisfactory state of repair. Figure 4.3.1-1 shows the dams by class throughout the County.

Figure 4.3.1-1. Dams by Class in Sussex County



Extent

The NJ DEP classifies dams according to their hazard potential using the following criteria:

- Class I - High Hazard Potential: This classification includes those dams, the failure of which may cause the probable loss of life or extensive property damage.
    - i. The existence of normally occupied homes in the area that are susceptible to significant damage in the event of a dam failure will be assumed to mean "probable loss of life".
    - ii. Extensive property damage means the destructive loss of industrial or commercial facilities, essential public utilities, main highways, railroads or bridges. A dam may be classified as having a high hazard potential based solely on high projected economic loss.
    - iii. Recreational facilities below a dam, such as a campground or recreation area, may be sufficient reason to classify a dam as having a high hazard potential.
- Class II - Significant Hazard Potential: This classification includes those dams, the failure of which may cause significant damage to property and project operation, but loss of human life is not envisioned. This classification applies to predominantly rural, agricultural areas, where dam failure may damage isolated homes, major highways or railroads or cause interruption of service of relatively important public utilities.
- Class III - Low Hazard Potential: This classification includes those dams, the failure of which would cause loss of the dam itself but little or no additional damage to other property. This classification applies to rural or agricultural areas where failure may damage farm buildings other than residences, agricultural lands or non-major roads.
- Class IV - Small Dams: This classification includes any project which impounds less than 15 acres/feet of water to the top of the dam, has less than 15 feet height-of-dam and which has a drainage area above the dam of 150 acres or less in extent. No dam may be included in Class IV if it meets the criteria for Class I or II. Any applicant may request consideration as a Class III dam upon submission of a positive report and demonstration proving low hazard.

Dam failures cause serious downstream flooding either because of partial or complete dam collapse. Failures are usually associated with intense rainfall and prolonged flood conditions; however, dam breaks may occur during dry periods as a result of progressive erosion of an embankment. The greatest threat from a dam break is to areas immediately downstream. Dam failures may or may not leave enough time for evacuation of people and property, depending on their abruptness. Seepages in earth dams usually develop gradually, and if the embankment damage is detected early, downhill residents have at least a few hours or days to evacuate. Failures of concrete or masonry dams tend to occur suddenly, sending a wall of water and debris down the valley at more than 100 mph. Survival would be a matter of having the good fortune not to be in the flood path at the time of the break. Dam failures due to the overtopping of a dam normally give sufficient lead time for evacuation.

The environmental impacts of a dam or levee failure can include significant water-quality and debris-disposal issues. Flood waters can back up sanitary sewer systems and inundate wastewater treatment plants, causing raw sewage to contaminate residential and commercial buildings and the flooded waterway. The contents of unsecured containers of oil, fertilizers, pesticides, and other chemicals get added to flood waters. Hazardous materials may be released and distributed widely across the floodplain. Water supply and wastewater treatment facilities could be offline for weeks. After the flood waters subside, contaminated and flood-damaged building materials and contents must be properly disposed of. Contaminated sediment must be removed from buildings, yards, and properties. In addition, severe erosion is likely; such erosion can negatively impact local ecosystems.

It is required by the State of New Jersey that all High Hazard and Significant Hazard dams must have NJDEP-approved Emergency Action Plans (EAP) in place. It is the responsibility of the dam owner to review and update the EAP on an annual basis. New Jersey Dam Safety Standards also require that are periodically inspected to identify conditions that may adversely affect the safety and functionality a dam its appurtenant structures; to

note the extent of deterioration as a basis for long term planning, periodic maintenance or immediate repair; to evaluate conformity with current design and construction practices; and to determine the appropriateness of the existing hazard classification. Inspection guidelines, as identified in the State Hazard Mitigation Plan, are reproduced in Table 4.3.1-1 in brief. Complete inspection and operating requirements for dams can be found in the New Jersey Dam Safety Standards (N.J.A.C 7:20-1.11).

Table 4.3.1-1. New Jersey Dam Inspection Requirements

Dam Size/Type	Regular Inspection	Formal Inspection
Class I (High Hazard) Large Dam	Annually	Once every 3 years
Class I (High Hazard) Dam	Once every 2 years	Once every 6 years
Class II (Significant Hazard) Dam	Once every 2 years	Once every 10 years
Class III (Low Hazard) Dam	Once every 4 years	Only as required
Class IV (Zero Hazard) Dam	Once every 4 years	Only as required

In New Jersey, every dam in the State as defined in the Safe Dam Act, N.J.S.A. 58:4 is required to meet State dam safety standards. Dam Safety Laws provide the NJDEP with enforcement capabilities to achieve statewide compliance with dam safety standards. This includes issuing orders for compliance to dam owners and pursuing legal action if the owner does not comply (with the goal of compliance and possible fines levied on a per-day basis for violations).

Previous Occurrences and Losses

FEMA Major Disasters and Emergency Declarations

Between 1954 and 2019, no disasters (DR) or emergencies (EM) were declared for dam failure in the State of New Jersey.

U.S. Department of Agriculture Disaster Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2019, Sussex County was not included in any USDA declaration involving dam failure.

Dam Failure Events

For the 2021 HMP update, known dam failure events that have impacted Sussex County between 2015 and 2019 were researched. No events were found to have occurred (NOAA NCEI 2020, FEMA 2020, NPDP 2020). For events prior to 2015, refer to Appendix E (Risk Assessment Supplement).

Probability of Future Occurrences

Dam failure events are infrequent and usually coincide with events that cause them, such as earthquakes, landslides, and excessive rainfall and snowmelt. As stated in the 2019 New Jersey State HMP, dam failures can occur suddenly, without warning, and may occur during normal operating conditions. This is referred to as a "sunny-day" failure. Dam failures may also occur during a large storm event. Significant rainfall can quickly inundate an area and cause floodwaters to overwhelm a reservoir. If the spillway of the dam cannot safely pass the resulting flows, water will begin flowing in areas not designed for such flows, and a failure may occur. New

Jersey has seen significant property damage including damage or loss of dams, bridges, roads, and buildings as a result of storm events and dam failures (NJOEM 2019).

There is a "residual risk" associated with dams. Residual risk is the risk that remains after safeguards have been implemented. For dams, the residual risk is associated with events beyond those that the facility was designed to withstand. However, the probability of any type of dam failure is low in today's dam safety regulatory and oversight environment (NJOEM 2019).

According to the 2011 HMP, 2016 HMP, and 2019 State HMP, there were at least 31 dam failures identified based on information queried from the National Performance of Dams Program (NPDP) database; however, details regarding every incident in the County were not included. Eighteen of these dam failures were associated with a severe storm in August 2000 where more than 14 inches of rain fell over a 4-day period. For the 2021 HMP update, however, a query of the NPDP database was conducted and it identified 16 dam incidents in Sussex County, with 15 occurring during the August 2000 severe storm event. Information from the Stanford University's NPDP database and the NOAA-NCDC storm events database were both used to identify the number of failures/incidents that occurred between 1950 and 2020. Using both sources ensures the most accurate probability estimates possible. The table below shows these statistics, as well as the annual average number of events and the estimated percent chance of an incident occurring in a given year (NOAA-NCDC 2020; NPDP 2020). Based on these statistics, there is an estimated 24.5% chance of a dam failure/incident occurring in any given year in Sussex County.

Table 4.3.1-2. Probability of Future Dam Damage and Failure Events

Hazard Type	Number of Occurrences Between 1950 and 2015	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	Percent Chance of occurrence in any given year
Dam Incident	16*	0.23	4.44	0.23	24.5%

Source: NOAA NCEI 2020; NPDP 2020

**15 events were associated with the August 2000 storm event which occurred over a 4-day period. The recurrence interval of this storm event is not known; therefore, the dam failure event probability is likely over-estimated.*

In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for dam failure in the county is considered 'rare' (between 1 and 10 percent annual probability of a hazard event occurring, as presented in Table 4.4-1). The ranking of the dam failure hazard for individual municipalities is presented in the jurisdictional annexes.

Climate Change Impacts

Dams are designed partly based on assumptions about a river's flow behavior, expressed as hydrographs. Changes in weather patterns can significantly affect the hydrograph used for the design of a dam. If the hygrograph changes, the dam conceivably could lose some or all of its designed margin of safety, also known as freeboard. Loss of designed margin of safety increases the possibility that floodwaters would overtop the dam or create unintended loads, which could lead to a dam failure.

Due to the increase in greenhouse gas concentrations since the end of the 1890s, New Jersey has experienced a 3.5° F (1.9° C) increase in the State's average temperature (Office of the New Jersey State Climatologist 2020), which is faster than the rest of the Northeast region (2° F [1.1° C]) (Melillo et al. 2014) and the world (1.5° F [0.8° C]) (IPCC 2014). This warming trend is expected to continue. As temperatures increase, Earth's atmosphere can hold more water vapor which leads to a greater potential for precipitation. Currently, New Jersey

receives an average of 46 inches of precipitation each year (Office of the New Jersey State Climatologist 2020). Since the end of the twentieth century, New Jersey has experienced slight increases in the amount of precipitation it receives each year, and over the last 10 years there has been a 7.9% increase. By 2050, annual precipitation in New Jersey could increase by 4% to 11% (Horton et al. 2015). By the end of this century, heavy precipitation events are projected to occur two to five times more often (Walsh et al. 2014) and with more intensity (Huang et al. 2017) than in the last century. New Jersey will experience more intense rain events, less snow, and more rainfalls (Fan et al. 2014, Demaria et al. 2016, Runkle et al. 2017). Also, small decreases in the amount of precipitation may occur in the summer months, resulting in greater potential for more frequent and prolonged droughts (Trenberth 2011). New Jersey could also experience an increase in the number of flood events (Broccoli et al. 2020).

A warmer atmosphere means storms have the potential to be more intense (Guilbert et al. 2015) and occur more often (Coumou and Rahmstorf 2012, Marquardt Collow et al. 2016, Broccoli et al. 2020). In New Jersey, extreme storms typically include coastal nor'easters, snowstorms, spring and summer thunderstorms, tropical storms, and on rare occasions hurricanes. Most of these events occur in the warmer months between April and October, with nor'easters occurring between September and April. Over the last 50 years, in New Jersey, storms that resulted in extreme rain increased by 71% (Walsh et al. 2014) which is a faster rate than anywhere else in the United States (Huang et al. 2017). As temperatures increase so will the energy in a storm system, increasing the potential for more intense tropical storms (Huang et al. 2017), especially those of Category 4 and 5 (Melillo et al. 2014).

Vulnerability Assessment

Dam failure inundation maps and downstream hazard areas are considered sensitive information and were not available for use in this risk assessment. To assess Sussex County's risk to dam failure, a qualitative review was conducted.

Impact on Life, Health, and Safety

The impact of dam and levee failure on life, health, and safety is dependent on several factors such as the class of dam/levee, the area that the dam/levee is protecting, the location of the dam/levee, and the proximity of structures, infrastructure, and critical facilities to the dam or levee structure. According to the State HMP, the level of impact that a failure would have can be predicted based upon the hazard potential classification as rated by the United States Army Corps of Engineers (State of NJ 2019). Table 4.3.1-3 outlines the recommended hazard classifications.

Table 4.3.1-3. United States Army Corps of Engineers Hazard Potential Classification

Hazard Category(a)	Direct Loss of Life (b)	Lifeline Losses (c)	Property Losses (d)	Environmental Losses (e)
Low	None (rural location, no permanent structures for human habitation)	No disruption of services (cosmetic or rapidly repairable damage)	Private agricultural lands, equipment, and isolated buildings	Minimal incremental damage
Significant	Rural location, only transient or day-use facilities	Disruption of essential facilities and access	Major public and private facilities	Major mitigation required
High	Certain (one or more) extensive residential, commercial, or industrial development	Disruption of essential facilities and access	Extensive public and private facilities	Extensive mitigation cost or impossible to mitigate

a. Categories are assigned to overall projects, not individual structures at a project.
b. Loss-of-life potential is based on inundation mapping of area downstream of the project. Analyses of loss-of-life potential should take into account the population at risk, time of flood wave travel, and warning time.

Hazard Category(a)	Direct Loss of Life (b)	Lifeline Losses (c)	Property Losses (d)	Environmental Losses (e)
c. Lifeline losses include indirect threats to life caused by the interruption of lifeline services from project failure or operational disruption; for example, loss of critical medical facilities or access to them. d. Property losses include damage to project facilities and downstream property and indirect impact from loss of project services, such as impact from loss of a dam and navigation pool, or impact from loss of water or power supply. e. Environmental impact downstream caused by the incremental flood wave produced by the project failure, beyond what would normally be expected for the magnitude flood event under which the failure occurs.				

Source: State of NJ 2019

The entire population residing within a dam failure inundation zone is considered exposed and potentially vulnerable to a dam failure event. The potential for loss of life is affected by the warming time provided, and capacity and number of evacuation routes available to populations living within these areas. Those most at risk include the economically disadvantaged and the population over the age of 65. The 2018 American Community Survey population estimates indicate there were 22,889 persons over 65 years old and 7,191 living below the poverty level in Sussex County. These populations are more at risk during a dam failure event because economically disadvantaged populations are likely to evaluate their risk and make the decision to evacuate based upon the net economic impact to their family, while elderly populations are likely to seek or need medical attention. The availability of medical attention may be limited due to isolation during a flood event and other difficulties in evacuating. There is often limited warning time for a dam failure event. Populations without adequate warning of the event are highly vulnerable.

Dam failure can cause persons to become displaced if flooding of structures occurs. Dam failure may mimic flood events, depending on the size of the dam reservoir and breach. Understanding potential outcomes of flooding for each dam in Sussex County would require intensive hydraulic modeling.

Impact on General Building Stock

All buildings and infrastructure located in the dam failure inundation zone are considered exposed and potentially vulnerable. Property located closest to the dam inundation area has the greatest potential to experience the largest, most destructive surge of water. All transportation infrastructure in the dam failure inundation zone is vulnerable to damage and potentially cutting off evacuation routes, limiting emergency access, and creating isolation issues. Utilities such as overhead power lines, cable and phone lines could also be vulnerable. Loss of these utilities could create additional isolation issues for the inundation areas.

Dam failure can cause severe downstream flooding and may transport large volumes of sediment and debris, depending on the magnitude of the event. Widespread damage to buildings and infrastructure affected by an event would result in large costs to repair these locations. In addition to physical damage costs, businesses can be closed while flood waters retreat and utilities are returned to a functioning state.

Impact on Critical Facilities and Lifelines

Dam failures may also impact critical facilities and infrastructure located in the downstream inundation zone. Consequentially, dam failure can cut evacuation routes, limit emergency access, and/or create isolation issues. Widespread damage to buildings and infrastructure affected by an event would result in large costs to repair these locations. In addition to physical damage costs, businesses can be closed while flood waters retreat and utilities are returned to a functioning state. Further, utilities such as overhead power lines, cable and phone lines could also be vulnerable. Loss of these utilities could create additional isolation issues for the inundation areas.

Impact on the Economy

Severe flooding that follows an event like a dam failure can cause extensive structural damage and withhold essential services. The cost to recover from flood damages after a surge will vary depending on the hazard risk of each dam. The State HMP discusses damages from dam failures ranging from $7 million to $25 million as a result of previous events in the State. This cost likely varies because of the density of structures and businesses that surround the dam protected area.

Severe flooding that follows an event like a dam failure can cause extensive damage to public utilities and disruptions to delivery of services. Loss of power and communications may occur and drinking water and wastewater treatment facilities can become temporarily out of operation. Debris from surrounding buildings can accumulate should the dam mimic major flood events, such as the 1-percent annual chance flood event that is discussed in Section 4.3.5 (Flood).

Impact on the Environment

The environmental impacts of a dam failure can include significant water-quality and debris-disposal issues or severe erosion that can impact local ecosystems. Flood waters can back up sanitary sewer systems and inundate wastewater treatment plants, causing raw sewage to contaminate residential and commercial buildings and the flooded waterway. The contents of unsecured containers of oil, fertilizers, pesticides, and other chemicals may get added to flood waters. Hazardous materials may be released and distributed widely across the floodplain. Water supply and wastewater treatment facilities could be offline for weeks. After the flood waters subside, contaminated and flood-damaged building materials and contents must be properly disposed of. Contaminated sediment must be removed from buildings, yards, and properties.

Future Changes That May Impact Vulnerability

Understanding future changes that affect vulnerability can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. Several factors are examined in this section to assess hazard vulnerability.

Projected Development

As discussed and illustrated in Section 3 (County Profile), areas targeted for future growth and development have been identified across the County. Any areas of growth could be potentially impacted by a dam or levee failure event if the structures are located within the flood protection area and mitigation measures are not considered. Therefore, it is the intention of the County and all participating municipalities to discourage development in vulnerable areas or to encourage higher regulatory standards at the local level. Due to the sensitive nature of dam locations and downstream inundation zones, an assessment to determine the proximity of these new development sites to potential dam inundation cannot be performed at this time.

Projected Changes in Population

Sussex County has experienced a population decline since 2010. According to the U.S. Census Bureau, the County's population has decreased 4.7-percent between 2010 and 2018 (U.S. Census Bureau 2020). The population is expected to continue to decrease as residents move away from the suburbs and towards urban centers (Stirling 2018). Even though the population has decreased, any changes in the density of population can impact the number of persons exposed to the probable maximum flood inundation hazard areas. Higher density can not only create issues for local residents during evacuation of a dam failure event, but can also have an effect on commuters that travel into and out of the County for work. Refer to Section 3 (County Profile) for more information about population trends in the County.

Climate Change

As discussed above, most studies project that the State of New Jersey will see an increase in average annual precipitation. Annual precipitation amounts in the region are projected to increase, primarily in the form of heavy rainfalls, which have the potential to increase the risk to dam failures. Increases in precipitation may stress the dam wall.

Further, existing dams may not be able to retain and manage increases in water flow from more frequent, heavy rainfall events. Heavy rainfalls may result in more frequent overtopping of these dams and flooding of the County's assets in adjacent inundation areas. However, the probable maximum flood used to design each dam may be able to accommodate changes in climate.

Vulnerability Change Since 2016 HMP

For the 2021 HMP update, risks to the County's population, building stock, and critical facilities were assessed. Overall, Sussex County remains potentially vulnerable to the dam failure hazard. To estimate losses to these elements in the future, dam inundation areas and depths of flooding may be used to analyze exposure and generate depth grids. Hazus could be implemented to estimate potential losses for Sussex County. In addition, inspections of dams may also inform the status of each and maintenance and mitigation measure that may be needed.

4.3.2 DISEASE OUTBREAK

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the disease outbreak hazard in Sussex County.

2021 HMP Changes

- This is a new hazard of concern for Sussex County.

Profile

Hazard Description

An outbreak or an epidemic occurs when new cases of a certain disease, in a given population, substantially exceed what is expected. An epidemic may be restricted to one locale, or it may be global, at which point it is called a pandemic. Pandemic is defined as a disease occurring over a wide geographic area and affecting a high proportion of the population. A pandemic can cause sudden, pervasive illness in all age groups on a local or global scale. A pandemic is a novel virus to which humans have no natural immunity that spreads from person-to-person. A pandemic will cause both widespread and sustained effects and is likely to stress the resources of both the State and federal government (NJOEM 2019).

Of particular concern in Sussex County are arthropod-borne viruses (arboviruses), which are viruses that are maintained in nature through biological transmission between susceptible hosts (mammals) and blood-feeding arthropods (mosquitos and ticks). More than 100 arboviruses can cause disease in humans; over 30 have been identified as human pathogens in the western hemisphere (New Jersey Department of Health and Senior Services 2008). New Jersey has been impacted by various past and present infestations including: high population of mosquitoes (mosquito-borne diseases) and deer ticks (tick-borne diseases).

Mosquito-borne diseases are diseases that are spread through the bite of an infected female mosquito. The three most common mosquito-borne diseases in New Jersey are: West Nile Virus (WNV), Eastern equine encephalitis (EEE) virus, and St. Louis encephalitis (SLE) virus. These diseases rely on mosquitos to spread. They become infected by feeding on birds carrying the virus; and then spread to humans and other animals when the mosquito bites them (New Jersey Department of Health 2013).

Tick-borne diseases are bacterial illnesses that spread to humans through infected ticks. The most common tick-borne diseases in New Jersey are: Lyme disease, Ehrlichiosis, Anaplasmosis, Rocky Mountain Spotted Fever, and Babesiois. These types of diseases rely on ticks for transmission. Ticks become infected by micro-organisms when feeding on small infected mammals (mice and voles). Different tick-borne diseases are caused by different micro-organisms, and it is possible to be infected with more than one tick-borne disease at a time. Anyone who is bitten by an infected tick may get a tick-borne disease. People who spend a lot of time outdoors have a greater risk of becoming infected. The three types of ticks in New Jersey that may carry disease-causing micro-organisms are the deer tick, lone star tick, and the American dog tick (New Jersey Department of Health 2013b).

For the purpose of this HMP update, the following arboviruses will be discussed in further detail: West Nile Virus, Eastern Equine Encephalitis virus, St. Louis Encephalitis virus, Lyme disease, and Ebola virus. Influenza will also be discussed due to several outbreaks in the past five years. In addition, due to the COVID-19 pandemic that emerged during the development of this plan update, a brief description is described in this section.

West Nile Virus

West Nile Virus (WNV) encephalitis is a mosquito-borne viral disease, which can cause an inflammation of the brain. WNV is commonly found in Africa, West Asia, the Middle East and Europe. For the first time in North America, WNV was confirmed in the New York metropolitan area during the summer and fall of 1999. WNV successfully over-wintered in the northeastern U.S. and has been present in humans, horses, birds, and mosquitoes since that time. WNV is spread to humans by the bite of an infected mosquito. A mosquito becomes infected by biting a bird that carries the virus (New Jersey Department of Health 2014).

Eastern Equine Encephalitis

Eastern Equine Encephalitis (EEE) is a virus disease of wild birds that is transmitted to horses and humans by mosquitoes. It is a rare but serious viral infection. EEE is most common in the eastern half of the U.S. and is spread by the bite of an infected mosquito. EEE can affect humans, horses, and some birds. The risk of getting this virus is highest from late July through early October (New Jersey Department of Health 2012a). New Jersey represents a major focus for the infection with some form of documented viral activity nearly every year. Horse cases are most common in the southern half of New Jersey because the acid water swamps that produce the major mosquito vectors are especially prevalent on the southern coastal plain (Crans 2013).

St. Louis Encephalitis

St. Louis Encephalitis (SLE) is a rare but serious viral infection. It is transmitted to humans by the bite of an infected mosquito. Most cases of SLE disease have occurred in eastern and central states. Most persons infected with SLE have no apparent illness. Initial symptoms of those who become ill include fever, headache, nausea, vomiting, and tiredness. Severe neuroinvasive disease (often involving encephalitis, an inflammation of the brain) occurs more commonly in older adults (CDC 2019).

Lyme Disease

Lyme disease is an illness caused by infection with the bacterium *Borrelia burgdorferi*, which is carried by ticks. The infection can cause a variety of symptoms and, if left untreated, can be severe. Lyme disease is spread to people by the bite of an infected tick. In New Jersey, the commonly infected tick is the deer tick. Immature ticks become infected by feeding on infected white-footed mice and other small mammals. Deer ticks can also spread other tick-borne diseases. Anyone who is bitten by a tick carrying the bacteria can become infected (New Jersey Department of Health 2012b).

Influenza

The risk of a global influenza pandemic has increased over the last several years. This disease is capable of claiming thousands of lives and adversely affecting critical infrastructure and key resources. An influenza pandemic has the ability to reduce the health, safety, and welfare of the essential services workforce; immobilize core infrastructure; and induce fiscal instability. Densely populated areas will spread diseases quicker than less densely populated areas (NJOEM 2019).

Pandemic influenza is different from seasonal influenza (or "the flu") because outbreaks of seasonal flu are caused by viruses that are already among people. Pandemic influenza is caused by an influenza virus that is new to people and is likely to affect many more people than seasonal influenza. In addition, seasonal flu occurs every year, usually during the winter season, while the timing of an influenza pandemic is difficult to predict. Pandemic influenza is likely to affect more people than the seasonal flu, including young adults. A severe pandemic could change daily life for a time, including limitations on travel and public gatherings (Barry-Eaton District Health Department 2013).

At the national level, the CDC's Influenza Division has a long history of supporting the World Health Organization (WHO) and its global network of National Influenza Centers (NIC). With limited resources, most international assistance provided in the early years was through hands-on laboratory training of in-country staff, the annual provision of WHO reagent kits (produced and distributed by CDC), and technical consultations for vaccine strain selections. The Influenza Division also conducts epidemiologic research including vaccine studies and serologic assays and provided international outbreak investigation assistance (CDC 2010).

Ebola Virus

Ebola, previously known as Ebola hemorrhagic fever, is a rare and deadly disease caused by infection with one of the Ebola virus strains. According to the CDC, the 2014 Ebola epidemic is the largest in history affecting multiple countries in West Africa. Two imported cases, including one death, and two locally-acquired cases in healthcare workers have been reported in the United States. CDC and partners are taking precautions to prevent the further spread of Ebola in the United States (CDC 2014).

Coronavirus

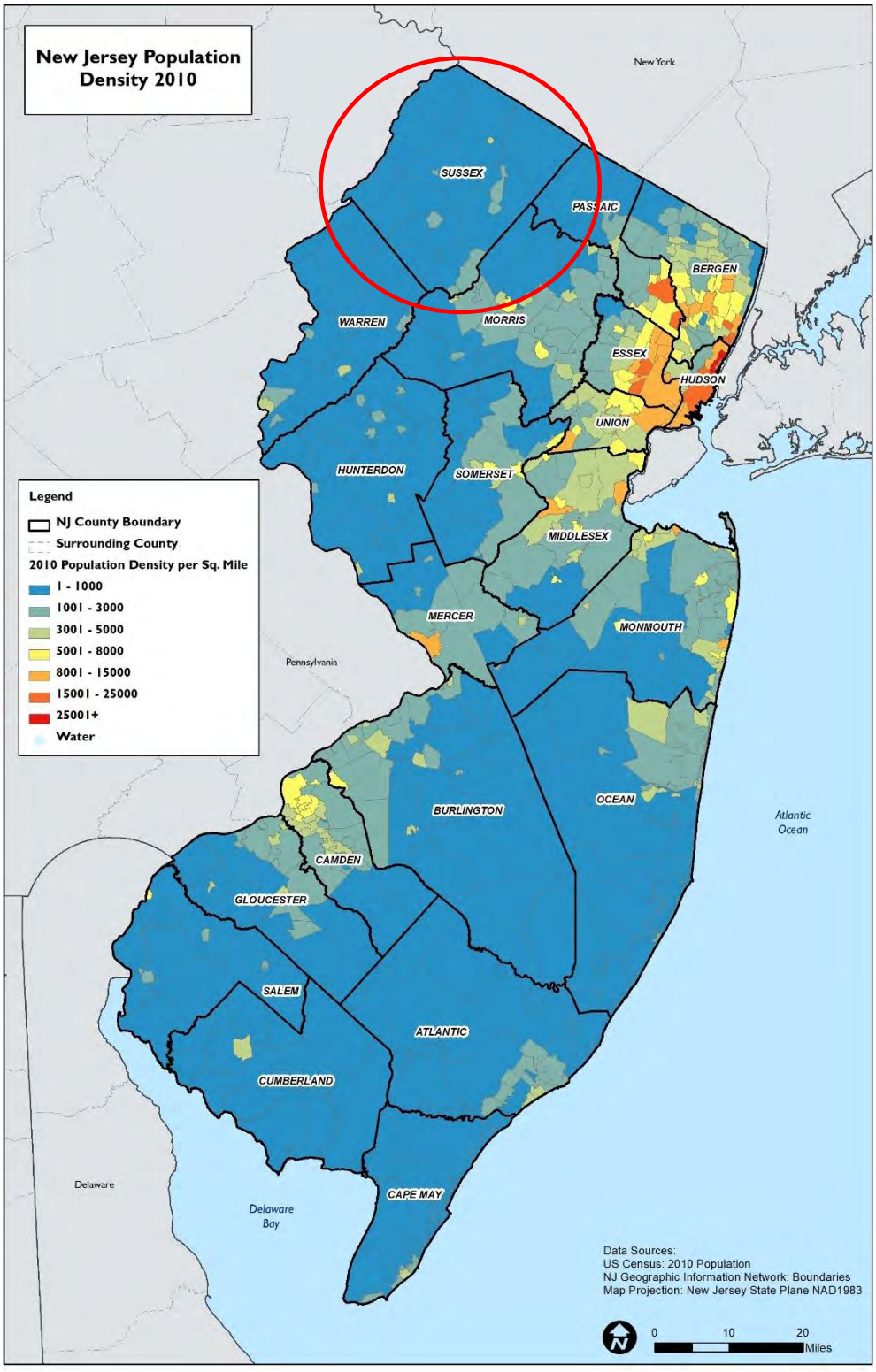
Coronavirus disease (COVID-19) is an infectious disease first identified in 2019. The virus rapidly spread into a global pandemic by spring of 2020. The elderly and those with underlying medical conductions such as cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness (WHO 2020). With the virus being relatively new, information regarding transmission and symptoms of the virus is emerging from the research. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes. Reported illnesses have ranged from mild symptoms to severe illness and death. Reported symptoms include trouble breathing, persistent pain or pressure in the chest, new confusion or inability to arouse, and bluish lips or face. Symptoms may appear 2-14 days after exposure to the virus (based on the incubation period of MERS-CoV viruses) (CDC 2020).

In an effort to slow the spread of the virus, the federal government and States have urged the public to avoid touching of the face, properly wash hands often, and use various social distancing measures. At the time of this plan update, there are no specific vaccines or treatments for COVID-19. However, there are many ongoing clinical trials evaluating potential treatments (WHO 2020).

Location

New Jersey's geographic and demographic characteristics make it particularly vulnerable to importation and spread of infectious diseases. All 21 counties in New Jersey have experienced the effects of a pandemic or disease outbreak. In terms of pandemic influenza, all counties may experience pandemic influenza outbreak caused by factors such as population density and the nature of public meeting areas. Densely populated areas will spread diseases quicker than less densely populated areas. Figure 4.3.2-1 shows population density throughout the State. Additionally, much of the State can experience other diseases such as WNV due to the abundance of water bodies throughout the State, which provide a breeding ground for infected mosquitos.

Figure 4.3.2-1. New Jersey Population Density (United States Census 2010)



Source: *United States Census 2010; New Jersey Geographic Information Network (NJGIN)*
Note: *Sussex County is circled in red.*

Extent

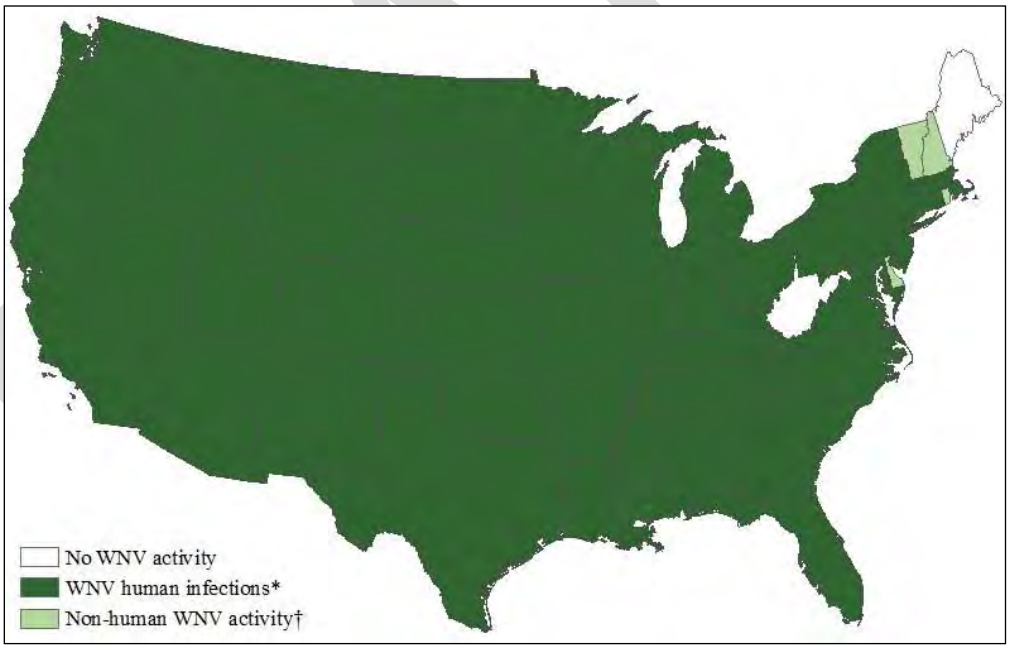
The exact size and extent of an infected population depends on how easily the illness is spread, the mode of transmission, and the amount of contact between infected and uninfected individuals. The transmission rates of pandemic illnesses are often higher in more densely populated areas. The transmission rate of infectious diseases will depend on the mode of transmission of a given illness.

The extent and location of disease outbreaks depends on the preferred habitat of the species, as well as the species' ease of movement and establishment. The magnitude of disease outbreaks species ranges from nuisance to widespread. The threat is typically intensified when the ecosystem or host species is already stressed, such as periods of drought. The already weakened state of the ecosystem causes it to more easily be impacted to an infestation. The presence of disease-carrying mosquitoes and ticks has been reported throughout most of New Jersey and Sussex County.

West Nile Virus

Since it was discovered in the western hemisphere, WNV has spread rapidly across North America, affecting thousands of birds, horses and humans. As of January 2020, every state in the continental United States aside from Maine and West Virginia has WNV activity with Delaware, Rhode Island, Vermont, and New Hampshire only being impacted by non-human WNV activity. Figure 4.3.2-2 shows the activity of WNV by state.

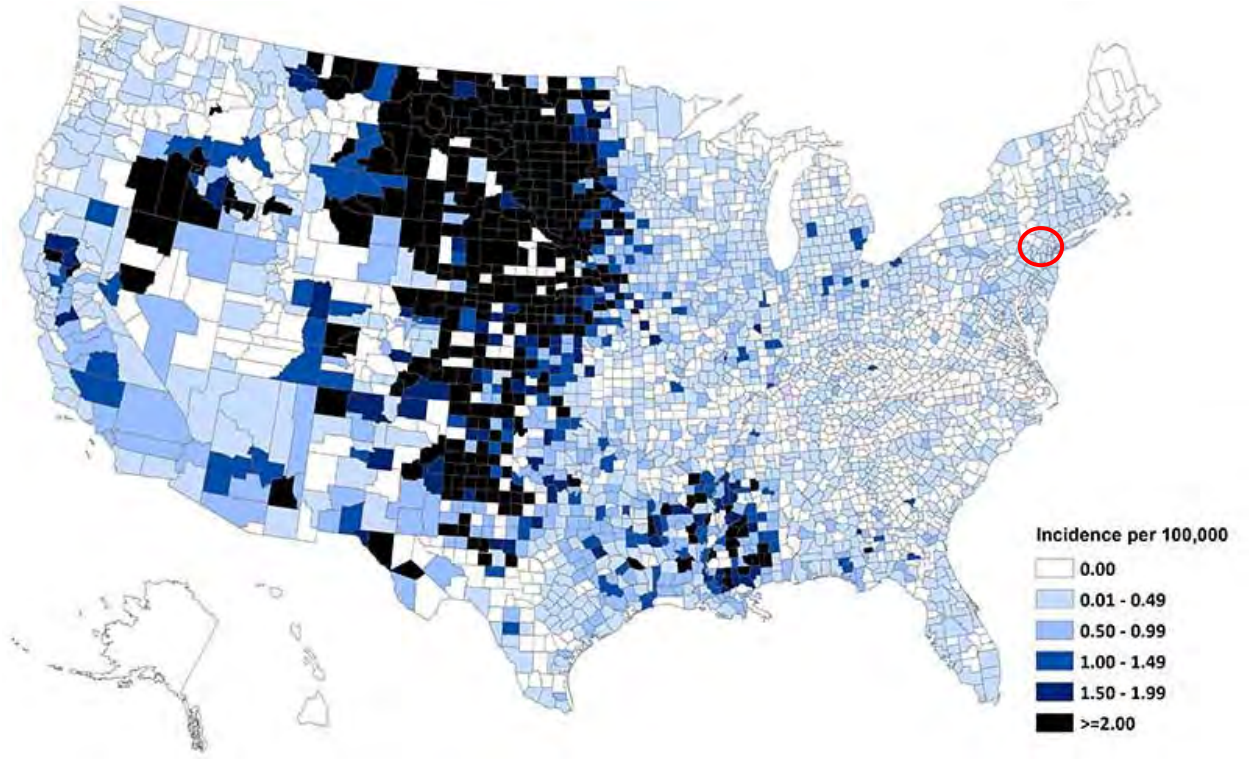
Figure 4.3.2-2. WNV Activity by State 2019



Source: CDC 2020

The CDC has a surveillance program for WNV. Data is collected on a weekly basis and reported for five categories: wild birds, sentinel chicken flocks, human cases, veterinary cases and mosquito surveillance (CDC 2019). Figure 4.3.2-3 illustrates WNV activity in the U.S. from 1999-2018.

Figure 4.3.2-3. Average Annual Incidence of West Nile Virus Neuroinvasive Disease Reported to CDC by County, 1999-2018



Source: *CDC 2019*
Note: *The circle indicates the approximate location of Sussex County.*

Eastern Equine Encephalitis

In the State of New Jersey, there has been five cases of EEE from 2010-2019 (CDC 2019.)

St. Louis Encephalitis

In the State of New Jersey, there have been no cases of St. Louis virus neuroinvasive disease from 2010-2019. However, nearby states have reported cases (CDC 2019).

Lyme Disease

Lyme disease is the most commonly reported vector borne illness in the U.S. Between 2014 and 2018, there were 1,404 confirmed cases of Lyme disease in Sussex County (NJ DOH 2020). Figure 4.3.2-4 shows the reported cases of Lyme disease in the northeast U.S. for 2018.

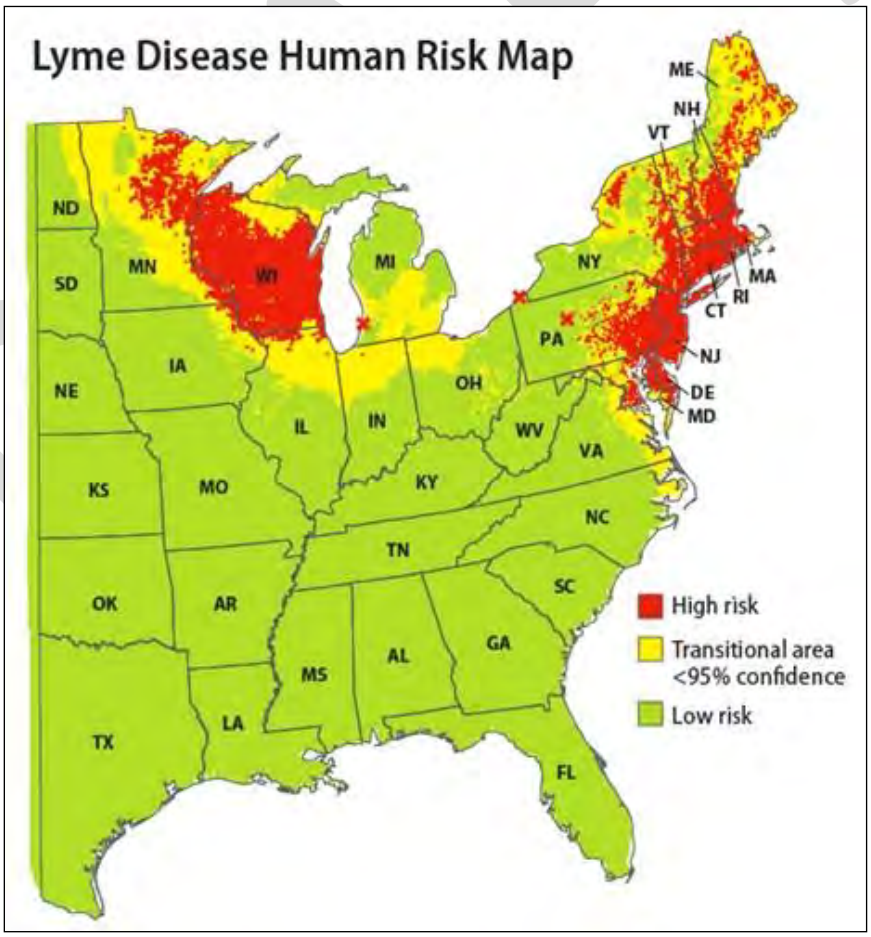
Figure 4.3.2-4. 2018 Reported Cases of Lyme Disease in the Northeast U.S.

Source: *CDC 2019*

Note: *The red circle indicates the approximate location of Sussex County.*

Figure 4.3.2-5 shows the risk of Lyme disease in the northeastern U.S. The figure indicates that Sussex County is located in a high-risk area.

Figure 4.3.2-5. Lyme Disease Human Risk Map in the Northeast U.S.



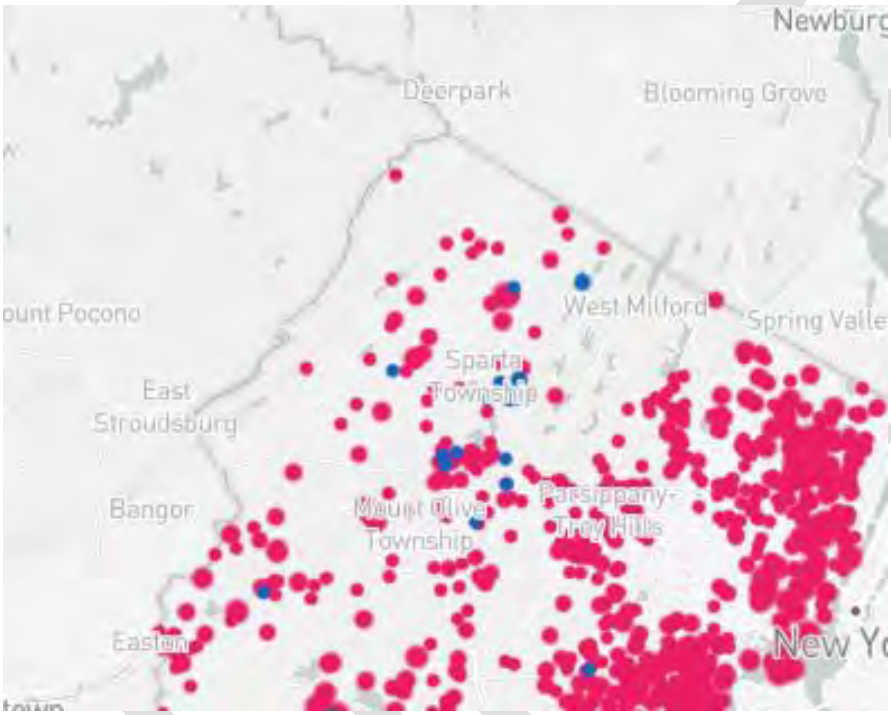
Source: *Yale School of Public Health, 2013*

Note (1): *Sussex County is in a high risk or transitional area.*

The CDC Division of Vector Borne Diseases (DVBD) indicated in 2018 that New Jersey was the state with the second-highest number of confirmed Lyme disease cases, totaling approximately 4,000 cases. For total number of cases between 2007 and 2017, New Jersey ranked third highest for the number of confirmed Lyme disease cases, totaling approximately 32,731 (12.4% of the total reported cases in the U.S.) New Jersey is also considered a High Incidence State for Lyme Disease, with the average incidence of at least 10 confirmed cases per 100,000 persons for three reporting years (CDC 2018).

Figure 4.3.2-6 below shows reports of arbovirus in Sussex County between January 2003 and October 2020. The red dots are for locations of mosquitos with West Nile Virus, whereas blue dots show the location of mosquitos carrying Eastern Equine Encephalitis.

Figure 4.3.2-6. Arbovirus Reports in Sussex County



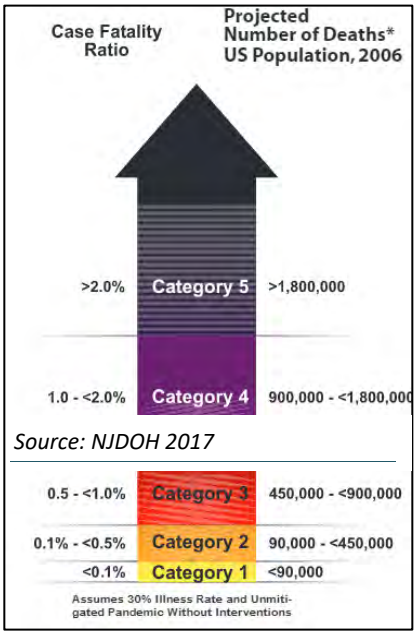
Source: VectorSurv Maps 2020

Influenza, Ebola and Coronavirus

The severity of a pandemic or infectious disease threat in New Jersey will range significantly depending on the aggressiveness of the virus in question and the ease of transmission. Pandemics around the nation have the potential to affect New Jersey's populated areas.

The CDC and Prevention Community Strategy for Pandemic Influenza Mitigation guidance introduced a Pandemic Severity Index (PSI), which uses the case fatality ratio as the critical driver for categorizing the severity of a pandemic. The index is designed to estimate the severity of a pandemic on a population to allow better forecasting of the impact of a pandemic, and to enable recommendations on the use of mitigation interventions

Figure 4.3.2-7. Pandemic PSI



Source: NJDOH 2017

that are matched to the severity of influenza pandemic. Pandemics are assigned to one of five discrete categories of increasing severity (Category 1 to Category 5) (NJDOH, 2017). Figure 4.3.2-7 illustrates the five categories of the Pandemic Severity Index (PSI).

In 1999, the WHO Secretariat published guidance for pandemic influenza and defined the six phases of a pandemic. Updated guidance was published in 2005 to redefine these phases. This schema is designed to provide guidance to the international community and to national governments on preparedness and response for pandemic threats and pandemic disease. Compared with the 1999 phases, the new definitions place more emphasis on pre-pandemic phases when pandemic threats may exist in animals or when new influenza virus subtypes infect people but do not spread efficiently. Because recognizing that distinctions between the two interpandemic phases and the three pandemic alert phases may be unclear, the WHO Secretariat proposes that classifications be determined by assessing risk based on a range of scientific and epidemiological data (WHO 2009). The WHO pandemic phases are outlined in Table 4.3.2-1.

Table 4.3.2-1. WHO Global Pandemic Phases

Phase	Description
Preparedness	
Phase 1	No viruses circulating among animals have been reported to cause infections in humans.
Phase 2	An animal influenza virus circulating among domesticated or wild animals is known to have caused infection in humans, and is therefore considered a potential pandemic threat.
Phase 3	An animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people, but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks. Limited human-to-human transmission may occur under some circumstances, for example, when there is close contact between an infected person and an unprotected caregiver. However, limited transmission under such restricted circumstances does not indicate that the virus has gained the level of transmissibility among humans necessary to cause a pandemic.
Response and Mitigation Efforts	
Phase 4	Human infection(s) are reported with a new subtype, but no human-to-human spread or at most rare instances of spread to a close contact.
Phase 5	Characterized by human-to-human spread of the virus into at least two countries in one WHO region. While most countries will not be affected at this stage, the declaration of Phase 5 is a strong signal that a pandemic is imminent and that the time to finalize the organization, communication, and implementation of the planned mitigation measures is short.
Phase 6	The pandemic phase, is characterized by community level outbreaks in at least one other country in a different WHO region in addition to the criteria defined in Phase 5. Designation of this phase will indicate that a global pandemic is under way.

Source: WHO 2009

In New Jersey, health and supporting agency responses to a pandemic are defined by the WHO phases and federal pandemic influenza stages, and further defined by New Jersey pandemic situations. The State's situations are similar, but not identical to the United States Department of Homeland Security federal government response stages. Transition from one situation to another indicates a change in activities of one or more New Jersey agencies. Table 4.3.2-2 compares the federal and New Jersey pandemic influenza phases and situations.

Table 4.3.2-2. Federal and New Jersey Pandemic Phases and Situations

Federal Pandemic Influenza Stage		New Jersey Situations	
0	New domestic outbreak in at-risk country (WHO Phase 1, 2, or 3)	1	Novel (new) influenza virus in birds or other animals outside the U.S.
		2	Novel (new) influenza virus in birds or other animals in the U.S./NJ
1	Suspected human outbreak overseas (WHO Phase 3)	3	Human case of novel (new) influenza virus outside of the U.S.
2	Confirmed human outbreak overseas (WHO Phase 4 or 5)	4	Human-to-human spread of novel (new) influenza outside the U.S. (no widespread human transmission)
		5	Clusters of human cases outside the U.S.
3	Widespread human outbreak in multiple locations overseas (WHO Phase 6)		
4	First human case in North America (WHO Phase 6)	6	Human case of novel (new) influenza virus (no human spread) in the U.S./NJ
5	Spread in the U.S. (WHO Phase 6)	7	First case of human-to-human spread of novel (new) influenza in the U.S./NJ
		8	Clusters of cases of human spread in the U.S./NJ
		9	Widespread cases of human-to-human spread of novel (new) influenza outside the U.S./NJ
6	Recovery and preparation for subsequent waves (WHO Phase 5 or 6)	10	Reduced spread of influenza or end of pandemic

Source: NJOEM 2019
NJ New Jersey
U.S. United States
WHO World Health Organization

Previous Occurrences and Losses

FEMA Major Disasters and Emergency Declarations

Between 1954 and 2020, Sussex County was included in two emergency declarations and one disaster declaration related to disease outbreak.

Table 4.3.2-3. Disease-Related Disaster (DR) and Emergency (EM) Declarations 1954-2020

Declaration	Event Date	Declaration Date	Event Description
EM-3156	May 30-November 1,2000	November 1, 2000	West Nile Virus
DR-4488 / EM-3451	January 20,2000 to present	March 25, 2020 and March 13, 2020	New Jersey COVID-19 Pandemic

Source: FEMA 2020

Disease Outbreak Events

Disease outbreak events that have impacted Sussex County between 2015 and 2020 are listed in Table 4.3.2-3. Please see Section 9 (Jurisdictional Annexes) for detailed information regarding impacts and losses to each municipality.

Table 4.3.2-3. Previous Occurrences of Disease Outbreak Events, 2014-2020

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Description
2014	Influenza	N/A	N/A	In 2014, 65 cases of nfluenza were reported in Sussex County.
2014	Lyme Disease	N/A	N/A	In 2014, 258 cases of Lyme disease were reported in Sussex County.
2015	Influenza	N/A	N/A	In 2015, 43 cases of influenza were reported in Sussex County.
2015	Lyme Disease	N/A	N/A	In 2015, 309 cases of Lyme disease were reported in Sussex County.
2016	Influenza	N/A	N/A	In 2016, 54 cases of influenza were reported in Sussex County.
2016	Lyme Disease	N/A	N/A	In 2016, 260 cases of Lyme disease were reported in Sussex County.
2017	Influenza	N/A	N/A	In 2017, 151 cases of influenza were reported in Sussex County.
2017	Lyme Disease	N/A	N/A	In 2017, 331 cases of Lyme disease were reported in Sussex County.
2017	West Nile Virus	N/A	N/A	In 2017, one case of West Nile Virus was reported in Sussex County.
2017	Zika Virus	N/A	N/A	In 2017, one case of Zika virus was reported in Sussex County
2018	Influenza	N/A	N/A	In 2018, 306 cases of influenza were reported in Sussex County.
2018	Lyme Disease	N/A	N/A	In 2018, 246 cases of Lyme disease were reported in Sussex County.
2019	Influenza	N/A	N/A	In 2019, 251 cases of influenza were reported in Sussex County.
2019	Lyme Disease	N/A	N/A	In 2019, 246 cases of Lyme disease were reported in Sussex County.
2020	Coronavirus	DR-4488 / EM-3451	Yes	In early spring of 2020, the coronavirus pandemic began. High numbers of hospitalizations and deaths prompted masking and social distancing requirements and the closure of schools and non-essential businesses. At the time of this plan update, the pandemic continues as do many social distancing and masking requirements. By October 19, 2020, Sussex County had recorded 1,652 cases and 197 deaths.

Source: FEMA 2020; NJDOH 2021

Note: Not all events that have occurred in Sussex County are included due to the extent of documentation and the fact that not all sources have been identified or researched.

Reportable disease statistics in NJ were only available up to 2018 at the writing of this plan update.

Probability of Future Occurrences

It is difficult to predict when the next disease outbreak will occur and how severe it will be because viruses are always changing. The Department of Health and Human Services and others are developing supplies of vaccines and medicines. In addition, the United States has been working with the WHO and other countries to strengthen detection of disease and response to outbreaks. Preparedness efforts are ongoing at the national, State, and

local level (NJOEM 2019). The Sussex County Division of Health is leading the effort in coordination with Sussex County DEM and other departments on the COVID-19 response.

In Sussex County, the probability for a future disease outbreak event is dependent on several factors. One factor that influences the spread of disease is population density. Populations that live close to one another are more likely to spread diseases. All of the critical components necessary to sustain the threat of mosquito-borne disease in Sussex County have been clearly documented. Instances of the WNV have been generally decreasing because of aggressive planning and eradication efforts, but some scientists suggest that as global temperatures rise and extreme weather conditions emerge from climate change, the range of the virus in the United States will grow (Epstein 2001). While instances of Zika have decreased since the outbreak in 2016, there is still the possibility of an outbreak occurring in the future. Therefore, based on all available information and available data regarding mosquito populations, it is anticipated that mosquito-borne diseases will continue to be a threat to Sussex County.

Disease-carrying ticks will continue to inhabit the northeast, including Sussex County, creating an increase in Lyme disease and other types of infections amongst the county population if not controlled or prevented. Ecological conditions favorable to Lyme disease, the steady increase in the number of cases, and the challenge of prevention predict that Lyme disease will be a continuing public health concern. Personal protection measures, including protective clothing, repellents or acaricides, tick checks, and landscape modifications in or near residential areas, may be helpful. However, these measures are difficult to perform regularly throughout the summer. Attempts to control the infection on a larger scale by the eradication of deer or widespread use of acaricides, which may be effective, have had limited public acceptance. New methods of tick control, including host-targeted acaricides against rodents and deer, are being developed and may provide help in the future (Steere, Coburn, and Glickstein, 2004).

Currently and in the future, control of Lyme disease will depend primarily on public and physician education about personal protection measures, signs and symptoms of the disease, and appropriate antibiotic therapy. Based on available information and the ongoing trends of disease-carrying tick populations, it is anticipated that Lyme disease infections will continue to be a threat to Sussex County.

In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Partnership, the probability of occurrence for disease outbreak in the County is considered ‘frequent’ (100 percent annual probability; a hazard event may occur multiple times per year, as presented in Table 4.4-1). The ranking of the disease outbreak hazard for individual municipalities is presented in the jurisdictional annexes (Section 9).

Climate Change Impacts

The relationship between climate change and increase in infectious diseases is difficult to predict with certainty, although there are scientific linkages between the two. Increased rainfall and heavy rainfalls increase the chances of standing water where mosquitos breed. As warm habitats that host insects such as mosquitoes increase, this may lead to an increase in individuals exposed to potential virus threats (The Washington Post, 2017). The notion that rising temperatures will increase the number of mosquitoes that can transmit diseases such as WNV and Zika among humans (rather than just shift their range) has been the subject of debate over the past decade. Some believe that climate change may affect the spread of disease, while others are not convinced. However, many researchers point out that climate is not the only force at work in increasing the spread of infectious diseases into the future (NJOEM 2019). Increased rainstorms contribute to flooding and poor drainage in Sussex County. As flooding events increase in the County owing to climate change, water-borne and vector-borne diseases (particularly those associated with mosquitos) may similarly increase owing to the prevalence of standing water over long periods (World Health Organization).

Providing projections of future climate change for a specific region is challenging. Shorter term projections are more closely tied to existing trends making longer term projections even more challenging. The further out a prediction reaches the more subject to changing dynamics it becomes.

Climate change includes changes in temperature, precipitation, or wind patterns, which occur over several decades or longer. Due to the increase in greenhouse gas concentrations since the end of the 1890s, New Jersey has experienced a 3.5° F (1.9° C) increase in the State's average temperature (Office of the New Jersey State Climatologist 2020), which is faster than the rest of the Northeast region (2° F [1.1° C]) (Melillo et al. 2014) and the world (1.5° F [0.8° C]) (IPCC 2014). This warming trend is expected to continue. By 2050, temperatures in New Jersey are expected to increase by 4.1 to 5.7° F (2.3° C to 3.2° C) (Horton et al. 2015). Thus, New Jersey can expect to experience an average annual temperature that is warmer than any to date (low emissions scenario) and future temperatures could be as much as 10° F (5.6° C) warmer (high emissions scenario) (Runkle et al. 2017). New Jersey can also expect that by the middle of the 21st century, 70% of summers will be hotter than the warmest summer experienced to date (Runkle et al. 2017). The increase in temperatures is expected to be felt more during the winter months (December, January, and February), resulting in less intense cold waves, fewer sub-freezing days, and less snow accumulation.

As temperatures increase, Earth's atmosphere can hold more water vapor which leads to a greater potential for precipitation. Currently, New Jersey receives an average of 46 inches of precipitation each year (Office of the New Jersey State Climatologist 2020). Since the end of the twentieth century, New Jersey has experienced slight increases in the amount of precipitation it receives each year, and over the last 10 years there has been a 7.9% increase. By 2050, annual precipitation in New Jersey could increase by 4% to 11% (Horton et al. 2015). By the end of this century, heavy precipitation events are projected to occur two to five times more often (Walsh et al. 2014) and with more intensity (Huang et al. 2017) than in the last century. New Jersey will experience more intense rain events, less snow, and more rainfalls (Fan et al. 2014, Demaria et al. 2016, Runkle et al. 2017). Also, small decreases in the amount of precipitation may occur in the summer months, resulting in greater potential for more frequent and prolonged droughts (Trenberth 2011). New Jersey could also experience an increase in the number of flood events (Broccoli et al. 2020).

Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard. The following discusses Sussex County's vulnerability, in a qualitative nature, to the disease outbreak hazard.

Impact on Life, Health and Safety

The entire population of Sussex County is vulnerable to the disease outbreak hazard. Due to a lack of quantifiable loss information, a qualitative assessment was conducted to evaluate the assets exposed to this hazard and the potential impacts associated with this hazard.

Maintaining certain key functions is important to preserve life and decrease societal disruption during pandemics. Heat, clean water, waste disposal, and corpse management all contribute to public health. Ensuring functional transportation systems also protects health by making it possible for people to access medical care and by transporting food and other essential goods. Critical infrastructure groups have a responsibility to maintain public health, provide public safety, transport medical supplies and food, implement a pandemic response, and maintaining societal functions. If these workers were absent due to pandemic outbreak, these systems will fail (CISA 2020).

Healthcare providers and first responders have an increased risk of exposure due to their frequent contact with infected populations. Areas with a higher population density also have an increased risk of exposure or

transmission of disease due to their proximity to potentially infected people. Further, the elderly and immunocompromised individuals may have increased vulnerability to becoming infected or experience exacerbated impacts depending upon the disease. Refer to Section 3 (County Profile) for summary of the vulnerable populations in Sussex County.

Most recently with COVID-19, the Centers for Disease Control and Prevention (CDC) has indicated that persons over 65 years and older, persons living in a nursing home or long-term care facility, and persons with underlying medical conditions such as diabetes, severe obesity, serious heart conditions, etc. are at a higher risk of getting severely ill (CDC 2020). Population data from the 2018 5-year American Community Survey indicates that 22,889 persons over 65 years old in Sussex County would be considered at risk for getting severely ill from the COVID-19 virus. While the statistics of this virus are subject to change during the publication of this HMP, the New Jersey Covid-19 dashboard shows that Sussex County is within the lower quarter of the impacted Counties. Overall, persons over 65 make up approximately 16.3-percent of positive COVID-19 cases in the entire State (NJ DOH 2020).

Impact on General Building Stock

No structures are anticipated to be directly affected by disease outbreaks.

Impact on Critical Facilities and Lifelines

While the actual structures of County and municipal buildings, critical facilities, and infrastructure will not be impacted by a pandemic or disease outbreak, the effect of absenteeism on workers will impact local government services. The most significant impact on critical facilities would be the increase in hospitalization and emergency room visits that would take place as a result of the outbreak. This would create a greater demand on these critical facilities, their staff, and resources.

Mortuary services could be substantially impacted due to the anticipated increased numbers of deaths. The timely, safe, and respectful disposition of the deceased is an essential component of an effective response. Pandemic influenza may quickly rise to the level of a catastrophic incident that results in mass fatalities, which will place extraordinary demands (including religious, cultural, and emotional burdens) on local jurisdictions and the families of the victims (Homeland Security Council 2006).

The healthcare system will be severely taxed, if not overwhelmed, from the large number of illnesses and complications from influenza requiring hospitalization and critical care. Ventilators will be the most critical shortage if a pandemic were to occur (Homeland Security Council 2006). The 2020 coronavirus pandemic has led to overwhelmed hospitals in numerous hotspots.

Impact on Economy

Costs associated with the activities and programs implemented to conduct surveillance and address disease outbreaks have not been quantified for this plan update. However, numerous activities and programs have been implemented by the County and State to address this hazard. Such resources include the COVID-19 Housing Assistance Program to help residents pay for housing costs and the Executive Order, Extending Utility Shutoff Moratorium to prohibit cable and telecommunication providers from disconnecting internet services (Sussex County 2021). Further, there has been secondary economic impact of closing non-essential facilities to reduce the spread of the virus. The final costs of this virus are still to be determined.

Most recently, the Health Department has played an active role in maintaining and controlling COVID-19 protocols across the County. This activity requires additional costs from the State and County to manage COVID-19 in communities. In April 2020, the Sussex County Board of Chosen Freeholders approved a $117.4-

million County budget, which reallocated existing budget from other accounts to the Office of Emergency Management and the Office of Public Health Nursing. The updated budget also moved funding to the mosquito control unit of the Health Department in order to fund aerial spraying and the use of larvacides (New Jersey Harold 2020).

Impact on Environment

Disease outbreaks may have an impact on the environment if the outbreaks are caused by invasive species. Invasive species tend to be competitive with native species and their habitat. One study has shown that invasive mosquitos such as the Asian tiger mosquito, a common invasive mosquito found in New Jersey, have "desiccation-resistant eggs," which means that they have enhanced survival in inhospitable environments (Juliano and Lounibos 2005). This species is considered a competitive predator and will prey on other species of mosquitos and a range of insects disrupting the natural food chain. Invasive species of mosquitos can be the major transmitters of disease like Zika, dengue, and yellow fever (Placer Mosquito and Vector Control District 2019).

Secondary impacts from mitigating disease outbreaks could also have an impact on the environment. Pesticides used to control disease carrying insects like mosquitos have been reviewed by the EPA and department of health. If these sprays are applied in large concentrations, they could potentially leach into waterways and harm nearby terrestrial species. However, there is a law in New Jersey's Pesticide Regulations that states "no person shall distribute, sell, offer for sale, purchase, or use any pesticide which has been suspended or canceled by the EPA, except as provided for in the suspension of cancellation order" (New Jersey nd).

Further Changes that May Impact Vulnerability

Understanding future changes that may impact vulnerability in the county can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors that may affect hazard vulnerability:

- Potential or projected development.
- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development

Any areas of growth could be potentially impacted by the disease outbreak hazard because the entire planning area is exposed. As population counts change in the County, there may be at increased risk to certain diseases. Higher concentrations of persons traveling via public transportation may become more vulnerable to the exchange of disease through airborne transmission.

Projected Changes in Population

Changes in population density may influence the number of persons exposed to disease outbreaks. Higher density jurisdictions are not only at risk of greater exposure to disease outbreak, density may also reduce available basic services provided by critical facilities such as hospitals and emergency facilities for persons that are not affected by a disease. Further, as the population ages there may be increased risk to this demographic. Older adults and people who have severe underlying medical conditions like heart or lung disease or diabetes seem to be at higher risk for developing more serious complications from certain diseases, such as COVID-19.

Climate Change

As discussed earlier in this section, the relationship between climate change and increase in infectious diseases is difficult to predict with certainty, however there may be linkages between the two. Changes in the environment may create a more livable habitat for vectors carrying disease as suggested by the Centers for Disease Control and Prevention (CDC n.d.). Localized changes in climate and human interaction may also be a factor in the spread of disease.

The relationship between climate change and infectious diseases is somewhat controversial. The notion that rising temperatures will increase the number of mosquitoes that can transmit malaria among humans (rather than just shift their range) has been the subject of debate over the past decade. Some believe that climate change may affect the spread of disease, while others are not convinced. However, many researchers point out that climate is not the only force at work in increasing the spread of infectious diseases into the future. Other factors, such as expanded rapid travel and evolution of resistance to medical treatments, are already changing the ways pathogens infect people, plants, and animals. As climate change accelerates it is likely to work synergistically with many of these factors, especially in populations increasingly subject to massive migration and malnutrition (Harmon 2010).

Vulnerability Change Since the 2016 HMP

Overall, the County continues to remain vulnerable to the disease outbreak hazard. Any changes or perceived increase in vulnerability may be attributed to changes in population numbers and density or the emergence of new diseases.

4.3.3 DROUGHT

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the drought hazard in Sussex County.

2021 HMP Changes

- New and updated figures from federal and state agencies are incorporated.
- Previous occurrences were updated with events that occurred between 2015 and 2020.
- The County's 2017 5-year American Community Survey population was considered when determining its exposure and vulnerability to the drought hazard.

Profile

Hazard Description

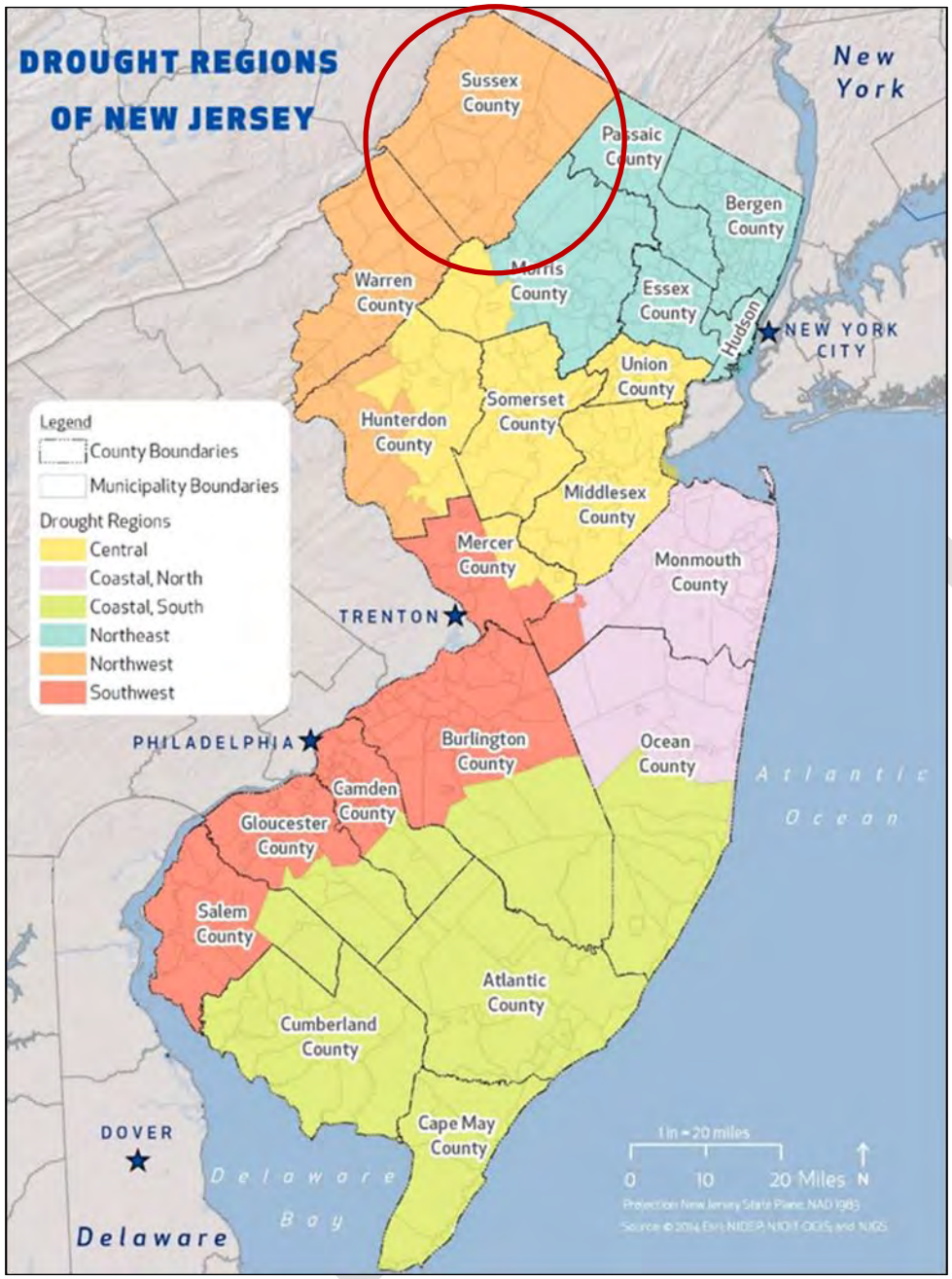
Drought is a period characterized by long durations of below normal precipitation. Drought conditions occur in virtually all climatic zones, yet characteristics of drought vary significantly from one region to another, relative to normal precipitation within respective regions. Drought can affect agriculture, water supply, aquatic ecology, wildlife, and plant life. Drought is a temporary irregularity in typical weather patterns and differs from aridity, which reflects low rainfall within a specific region and is a permanent feature of the climate of that area.

Location

Climate divisions are regions within a state that are climatically homogenous. The National Oceanic and Atmospheric Administration (NOAA) has divided the U.S. into 359 climate divisions. The boundaries of these divisions typically coincide with the county boundaries, except in the western U.S., where they are based largely on drainage basins (U.S. Energy Information Administration, Date Unknown). According to NOAA, New Jersey is made up of three climate divisions: Northern, Southern, and Coastal; Sussex County is located in the Northern Climate Division (NOAA, 2012).

Drought regions allow New Jersey to respond to changing conditions without imposing restrictions on areas not experiencing water supply shortages. New Jersey is divided into six drought regions that are based on regional similarities in water supply sources and rainfall patterns (Hoffman and Domber, 2003). Sussex County is located in the Northwest Drought Region. Other counties in the Northwest Drought region include Hunterdon and Warren Counties (Hoffman and Domber, 2003) (see Figure 4.3.3-1). These regions were developed based upon hydro-geologic conditions, watershed boundaries, municipal boundaries, and water supply characteristics. Drought region boundaries are contiguous with municipal boundaries because during a water emergency, the primary enforcement mechanism for restrictions is municipal police forces.

Figure 4.3.3-1. Drought Regions of New Jersey

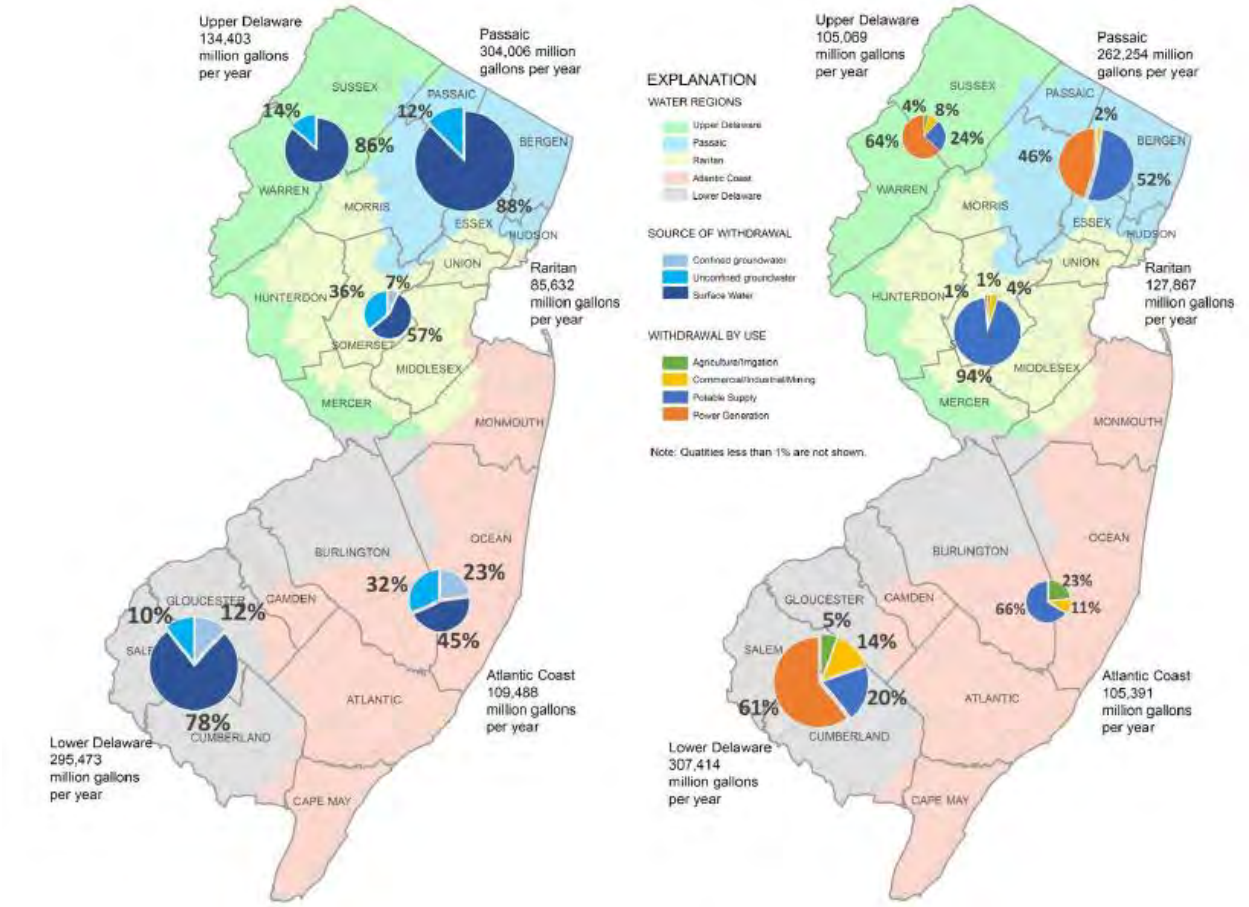


Source: *NJHMP 2019*

Note: *The red circle indicates the location of Sussex County. The County is located within the Northwest Drought Region of New Jersey.*

There are five water regions across the State (compiled from HUCH11 Watershed Management Areas). Sussex County is located in the Upper Delaware water region with a small area along the southeast border with Passaic County located in the Passaic water region; refer to Figure 4.3.3-2. The County's water supply sources are from surface water and unconfined groundwater sources. In terms of annual water withdrawal by sector, the majority is for power generation, followed by potable water supply, commercial/industrial/mining, and agriculture. Water use trends, similar to withdrawal trends, vary from month to month with water use typically peaking during summer months when outdoor and irrigation demands are high (NJDEP 2017).

Figure 4.3.3-2. Water Regions, Sources and Withdrawal by Sector in New Jersey



Source: NJDEP 2017

According to the 2017 Census of Agriculture, Sussex County is home to 1,008 farms covering 59,755 acres. Roughly 407 acres are irrigated (USDA 2017). Farms are considered to be at a higher risk for drought impacts than other types of land use. Table 4.3.3-1 shows the agricultural land use area within Sussex County jurisdictions.

Table 4.3.3-1. Agricultural Land Use Area by Jurisdiction

Jurisdiction	Total Area (Acres)	Agriculture	
		Area (Acres)	Percent of Total Area
Andover (B)	872	211	24.2%
Andover (Twp)	13,304	1,407	10.6%
Branchville (B)	383	7	1.9%
Byram (Twp)	14,536	74	0.5%
Frankford (Twp)	22,585	4,360	19.3%
Franklin (B)	2,833	188	6.6%

Jurisdiction	Total Area (Acres)	Agriculture	
		Area (Acres)	Percent of Total Area
Fredon (Twp)	11,464	2,619	22.8%
Green (Twp)	10,429	2,575	24.7%
Hamburg (B)	747	10	1.3%
Hampton (Twp)	16,305	1,959	12.0%
Hardyston (Twp)	20,892	985	4.7%
Hopatcong (B)	7,949	25	0.3%
Lafayette (Twp)	11,499	2,930	25.5%
Montague (Twp)	29,840	1,088	3.6%
Newton (T)	2,164	42	1.9%
Ogdensburg (B)	1,438	13	0.9%
Sandyston (Twp)	26,926	1,841	6.8%
Sparta (Twp)	24,828	1,007	4.1%
Stanhope (B)	1,341	0	0.0%
Stillwater (Twp)	18,076	1,509	8.3%
Sussex (B)	399	8	1.9%
Vernon (Twp)	44,769	1,756	3.9%
Walpack (Twp)	15,945	369	2.3%
Wantage (Twp)	43,175	9,761	22.6%
Sussex County (Total)	**342,701**	**34,745**	**10.1%**

Source: NJDEP, 2015
Note: B = Borough; T = Town; Twp = Township; % = Percent

Extent

The severity of a drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. The longer the duration of the drought and the larger the area impacted, the more severe the potential impacts. The State of New Jersey uses a multi-index system that takes advantage of some of these indices to determine the severity of a drought or extended period of dry conditions.

Palmer Drought Severity Index

The Palmer Drought Severity Index is commonly used by drought monitoring agencies for drought reporting. The PDSI is primarily based on soil conditions. Soil with decreased moisture content is the first indicator of an overall moisture deficit. Table 4.3.3-2 lists the PDSI classifications. At the one end of the spectrum, 0 is used as normal and drought is indicated by negative numbers. For example, -2 is moderate drought, -3 is severe drought, and -4 is extreme drought. The PDSI also reflects excess precipitation using positive numbers; however, this is not shown in Table 4.3.3-2 (National Drought Mitigation Center [NDMC] 2013).

Table 4.3.3-2. Palmer Drought Category Descriptions

Category	Description	Possible Impacts	Palmer Drought Index
D0	Abnormally Dry	Going into drought: short-term dryness slowing	-1.0 to -1.99

Category	Description	Possible Impacts	Palmer Drought Index
		planting and growth of crops or pastures; fire risk above average. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.	
D1	Moderate drought	Some damage to crops and pastures; fire risk high; streams, reservoirs, or wells low; some water shortages developing or imminent; voluntary water-use restrictions requested.	-2.0 to -2.99
D2	Severe drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-3.0 to -3.99
D3	Extreme drought	Major crop or pasture losses; extreme fire danger; widespread water shortages or restrictions.	-4.0 to -4.99
D4	Exceptional drought	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells, creating water emergencies.	-5.0 or less

Source: NDMC 2013

The Division of Water Supply and Geoscience within the NJDEP, regularly monitors various water supply conditions within the state based on the different Water Supply Regions. The water supply conditions aid the Department in declaring the regions as being within one of the four stages of water supply drought, Normal, Drought Watch, Drought Warning, and Drought Emergency.

- A ***Drought Watch*** is an administrative designation made by the Department when drought or other factors begin to adversely affect water supply conditions. A Watch indicates that conditions are dry but not yet significantly so. During a drought Watch, the Department closely monitors drought indicators (including precipitation, stream flows and reservoir and ground water levels, and water demands) and consults with affected water suppliers.
- A ***Drought Warning*** represents a non-emergency phase of managing available water supplies during the developing stages of drought and falls between the Watch and Emergency levels of drought response. The aim of a Drought Watch is to avert a more serious water shortage that would necessitate declaration of a water emergency and the imposition of mandatory water use restrictions, bans on water use, or other potentially drastic measures.
- A ***Drought Emergency*** can only be declared by the governor. While drought warning actions focus on increasing or shifting the supply of water, efforts initiated under a water emergency focus on reducing water demands. During a water emergency, a phased approach to restricting water consumption is typically initiated. Phase I water use restrictions typically target non-essential, outdoor water use (NJDEP Division of Water Supply and Geoscience 2018).

Previous Occurrences and Losses

Precipitation variability, coupled with concentrated population centers, can produce wide fluctuations in water availability and demands. The State and County have experienced several episodes of drought that have resulted in water shortages of varying degrees (e.g., mid-1960's, early to mid-1980's and 2001-2002) (NJDEP 2017).

Federal Disaster Declarations

Between 1954 and 2020, the State of New Jersey experienced two FEMA declared drought-related major disasters (DR) or emergencies (EM) classified as a water shortage. Generally, these disasters cover a wide region

of the State; therefore, they may have impacted many counties. Of those two declarations, Sussex County has been included in both declarations (FEMA 2020).

Table 4.3.3-3. FEMA DR and EM Declarations Since 2008 for Drought Events in Sussex County

FEMA Declaration Number	Date(s) of Event	Declaration Date	Event Description
DR-205	August 18, 1965	August 18, 1965	Drought: Water Shortage
EM-3083	October 19, 1980	October 19, 1980	Drought: Water Shortage

Source: FEMA 2020

USDA Disaster Declarations

Agriculture-related drought disasters are quite common. The USDA Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. In 2015, Sussex County was included in declaration S3930 for excessive heat and drought with losses for all other crops totaling $47,315.10 (USDA 2020a, USDA 2020b).

Drought events identified for Sussex County between 2015 and 2020 are listed in Table 4.3.3-4. For this 2021 HMP update, known drought events that have impacted Sussex County prior to 2015 are identified in Appendix E (Risk Assessment Supplement).

Table 4.3.3-4. Drought Incidents in Sussex County, 2015 to 2020

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Description
August 26, 2014 – June 29, 2015	Drought	N/A	N/A	According to the U.S. Drought Monitor, conditions held at a D0 or "abnormally dry" status across Sussex County from August 26, 2014 – May 18, 2015; D1 or "moderate drought" status from May 19, 2015 – June 22, 2015; D0 or "abnormally dry" from June 23, 2015 – June 29, 2015. Residents around Lake Hopatcong, concerned about the lake level, sought a reduction in water release.
August 11, 2015 – January 11, 2016	Drought	N/A	N/A	According to the U.S. Drought Monitor, conditions held at a D0 or "abnormally dry" status across Sussex County from August 11, 2015 – January 11, 2016. Boats were pulled early from Lake Hopatcong. Water restrictions were placed in Newton.
February 2-28, 2016	Drought	N/A	N/A	According to the U.S. Drought Monitor, conditions held at a D0 or "abnormally dry" status across Sussex County from February 2-28, 2016.
March 29, 2016 – April 10, 2017	Drought	N/A	N/A	According to the U.S. Drought Monitor, conditions held at a D0 or "abnormally dry" status across Sussex County from March 29, 2016 – June 13, 2016; D1 or "moderate drought" status from June 14, 2016 – August 15, 2016; D0 or "abnormally dry" status from August 16, 2016 – September 12, 2016; D1 or "moderate drought" status from September 13, 2016 – October 17, 2016; D2 or "severe drought" from October 18, 2016 – March 20,

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Description
				2017; D1 or "moderate drought" from– March 20, 2017 – April 10. Warm, low waters negatively impacted New Jersey trout. A drought watch was issued in July 2016. A drought warning was issued in October 2016. Water conservation was urged in northern New Jersey. The warning was lifted in April 2017.
October 3-30, 2017	Drought	N/A	N/A	According to the U.S. Drought Monitor, conditions held at a D0 or "abnormally dry" status across Sussex County from October 3- 30, 2017.
November 28, 2017 – February 12, 2018	Drought	N/A	N/A	According to the U.S. Drought Monitor, conditions held at a D0 or "abnormally dry" status across Sussex County from November 28, 2017 – February 12, 2018. Low reservoirs were reported in northern New Jersey.
September 24, 2019 – November 11, 2019	Drought	N/A	N/A	According to the U.S. Drought Monitor, conditions held at a D0 or "abnormally dry" status across Sussex County from September 24, 2019 – November 11, 2019. A fire restriction was issued in northern New Jersey.
March 17-30, 2020.	Drought	N/A	N/A	According to the U.S. Drought Monitor, conditions held at a D0 or "abnormally dry" status across Sussex County from March 17-30, 2020.
July 7-August 11, 2020	Drought	N/A	N/A	According to the U.S. Drought Monitor, conditions held at a D0 or "abnormally dry" status across Sussex County from July 7-August 11, 2020.

Source: USDA 2020, NDMC 2020, FEMA 2020, US Drought Monitor 2020
Please note that not all events that have occurred in Sussex County are included due to the extent of documentation and the fact that not all sources may have been identified or researched. Loss and impact information could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP update.

Probability of Future Occurrences

Based on the historical occurrences for drought, it is likely that droughts will occur across New Jersey and Sussex County in the future. Drought affects groundwater sources but not as quickly as surface water supplies. In addition, as temperatures increase (see climate change impacts), the probability for future droughts will likely increase as well.

It is estimated that Sussex County will continue to experience direct and indirect impacts of drought and its impacts on occasion, with the secondary effects causing potential disruption or damage to agricultural activities and creating shortages in water supply within communities.

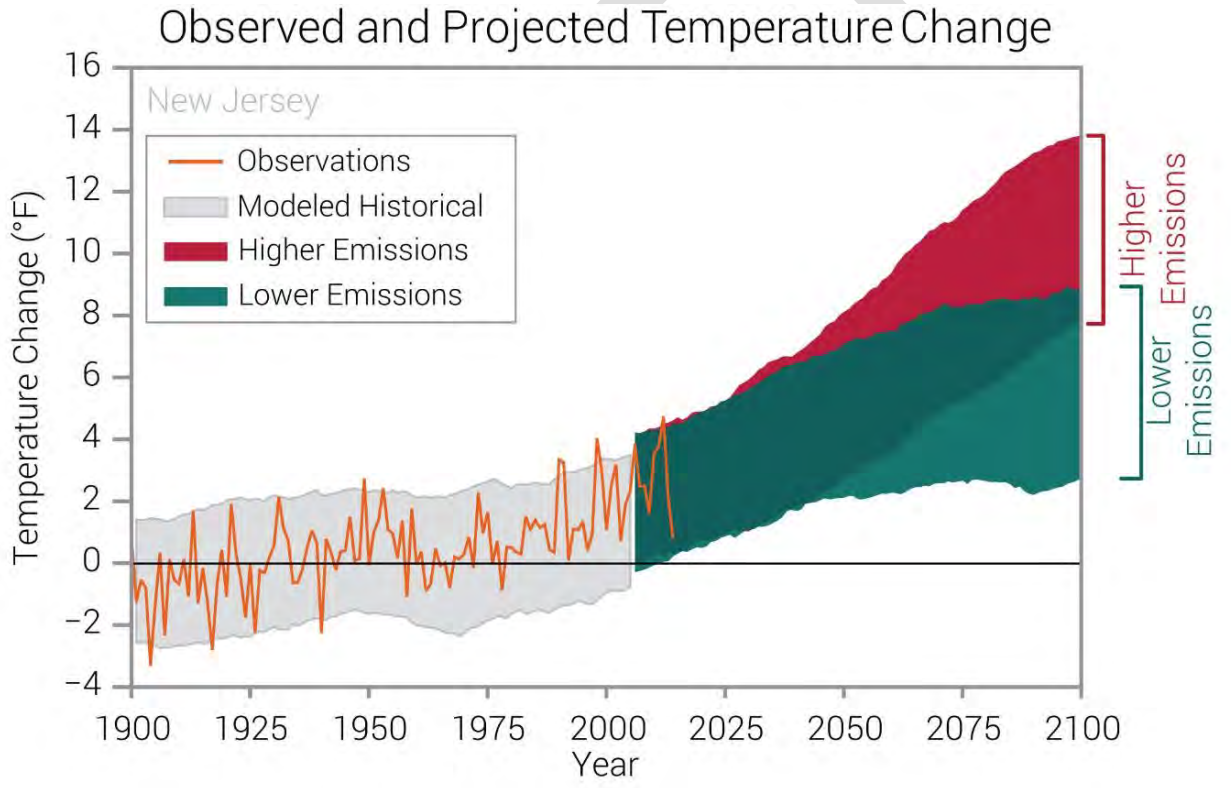
In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Partnership, the probability of occurrence for drought is considered 'frequent' (100 percent annual probability; a hazard event may occur multiple times per year, as presented in Table 4.4-1). The ranking of the drought hazard for individual municipalities is presented in the jurisdictional annexes.

Climate Change Impacts

Water resources are important to both society and ecosystems. Humans depend on reliable, clean supply of drinking water to sustain their health. Water is also needed for agriculture, energy production, navigation, recreation, and manufacturing. These water uses put pressure on water resources and are most likely to be worsened by climate change in the future.

The climate of New Jersey is already changing and will continue to change over the course of this century. Since 1900, temperatures in New Jersey have increased an average of 3 degrees Fahrenheit (°F). Historically unprecedented warming is projected by the end of the 21st century. Heat waves are projected to be more intense while cold waves are projected to be less intense. (Office of the New Jersey State Climatologist [ONJSC] 2020). New Jersey has consistently been above the 1900-2014 mean during the 21st century with the highest 5-year average number occurring during 2010-2014 (NOAA NCICS 2020). Figure 4.3.3-3 depicts the observed and projected temperature change for New Jersey from 1900 to 2100.

Figure 4.3.3-3. Observed and Projected Temperature Change in New Jersey



Source: NOAA NCICS 2020

Either under a high or lower emissions pathway, historically unprecedented warming is projected by the end of the 21st century. Increases in the number of extremely hot days and decreases in the number of extremely cold days are projected to accompany the overall warming. According to state-level analysis, by the middle of the 21st century an estimated 70% of summers in this northeast region are anticipated to be hotter than what we now recognize as the warmest summer on record. (NOAA NCICS 2020) These trends will certainly affect the probability and frequency of dry conditions that could lead to drought events in Sussex County.

Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. The following discusses Sussex County's vulnerability, in a qualitative nature, to the drought hazard.

Impact on Life, Health and Safety

The entire population of Sussex County is exposed to drought events (population of 142,298 people, according to the 2014-2018 American Community Survey population estimates). Drought conditions can cause a shortage of potable water for human consumption, both in quantity and quality. A decrease in available water may also impact power generation and availability to residents.

Public health impacts may include an increase in heat-related illnesses, waterborne illnesses, recreational risks, limited food availability, and reduced living conditions. Vulnerable populations could be particularly susceptible to the drought hazard and cascading impacts due to age, health conditions, and limited ability to mobilize to shelter, cooling and medical resources. Other possible impacts to health due to drought include increased recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and sanitation and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Health implications of drought are numerous. Some drought-related health effects are short-term while others can be long-term (CDC 2020).

Surface water supplies are affected more quickly during droughts than groundwater sources; however, groundwater supplies generally take longer to recover. According to the NJ Drinking Water Watch List, there are 490 suppliers of water to Sussex County (NJ Drinking Water Watch 2020). Of these suppliers, only two suppliers provide water from surface water sources. All other suppliers provide water from groundwater sources. The EPA classifies water suppliers into three major categories: community water systems, non-transient non-community water systems, transient non-community water systems.

- ***Community Water System*** **(CWS):** A public water system that supplies water to the same population year-round.
- ***Non-Transient Non-Community Water System*** **(NTNCWS)**: A public water system that regularly supplies water to at least 25 of the same people at least six months per year. Some examples are schools, factories, office buildings, and hospitals which have their own water systems.
- ***Transient Non-Community Water System*** **(TNCWS)**: A public water system that provides water in a place such as a gas station or campground where people do not remain for long periods of time (EPA 2020).

Overall, in Sussex County, 347 sources are transient non-community water suppliers, 78 are non-transient non-community suppliers, 63 are community suppliers, and 2 are non-public water supplies. Some County residents and organizations also rely on private wells for their water supply needs.

The CDC 2016 Social Vulnerability Index (SVI) ranks U.S. Census tracts on socioeconomic status, household composition and disability, minority status and language, and housing and transportation. Sussex County's overall score is 0.0325, indicating that its communities have very low social vulnerability (CDC 2016). Out of all the census tracts in the County, only one has very high vulnerability which is located in south central Sussex County.

Impact on General Building Stock

No structures are anticipated to be directly affected by a drought event. However, droughts contribute to conditions conducive to wildfires and reduce fire-fighting capabilities. Risk to life and property is greatest in those areas where forested areas adjoin urbanized areas (high density residential, commercial and industrial) also known as the wildfire urban interface (WUI) or where areas are made up of species that are highly susceptible

to erupting into wildfire events. Therefore, all assets in and adjacent to the WUI zone and wildfire fuel hazard areas, including population, structures, critical facilities, lifelines, and businesses are considered vulnerable to wildfire. Refer to Section 4.3.13 for the Wildfire risk assessment.

Impact on Critical Facilities and Lifelines

As mentioned, drought events generally do not impact buildings; however, droughts have the potential to impact agriculture-related facilities, critical facilities and lifelines that are associated with water supplies such as potable water used with fire-fighting services. The impacts droughts cause to agricultural-related facilities is particularly important to Sussex County due to its high amount of acreage devoted to farmland. Critical facilities and lifelines in and adjacent to the wildfire hazard areas are also considered vulnerable to drought.

Water systems and thus distribution to the population may also be impacted by other hazards such as extreme weather events. A good example is Superstorm Sandy where storm surge damaged critical water supply infrastructure along the coast and high winds impacted energy distribution across the State which in turn impacted the ability to supply water. As a result, NJDEP has developed new guidance aimed to ensure that repairs, reconstruction, new facilities and operations/maintenance are focused on enhancing the resilience of critical infrastructure (NJDEP 2017).

Impact on the Economy

Drought can produce a range of impacts that span many economic sectors and can reach beyond an area experiencing physical drought. As previously discussed, water withdrawals are not only used for potable water but for use in the commercial/industrial/mining sectors and power generation. When a state of water emergency is declared by the Governor (when a potential or actual water shortage endangers the public health, safety and welfare), the NJDEP may impose mandatory water restrictions and require specific actions to be taken by water suppliers. According to the New Jersey Water Supply Plan, a water emergency seeks to cause as little disruption as possible to commercial activity and employment (NJDEP 2017).

A prolonged drought can have a serious economic impact on a community. When drought conditions persist with little to no relief, water restrictions may be put into place by local or state governments. These restrictions may include placing limitations on when or how frequent lawns can be watered, car washing services, or any other recreational/commercial outdoor use of water supplies. In exceptional drought conditions, watering of lawns and crops may not be an option. If crops are not able to receive water, farmland will dry out and crops will die. This can lead to crop shortages, which, in turn, increases the price of food.

Increased demand for water and electricity can also result in shortages and higher costs for these resources. Industries that rely on water for business could be impacted the most (e.g., landscaping businesses). Although most businesses will still be operational, they may be impacted aesthetically. These aesthetic impacts are most significant within the recreation and tourism industry. Moreover, droughts within another area could impact the food supply and price of food for residents within the County.

Direct impacts of drought include reduced crop yield, increased fire hazard, reduced water levels, and damage to wildlife and fish habitat. The many impacts of drought can be listed as economic, environmental, or social. Direct and indirect losses include the following:

- Damage to crop quality and crop losses.
- Insect infestation leading to crop and tree losses.
- Plant diseases leading to loss of agricultural crops and trees.
- Reduction in outdoor activities.
- Increased risk of brush fires and wildfires due to dried crops, grasses, and dying trees.

When a drought occurs, the agricultural industry is most at risk in terms of economic impact and damage. For example, crops may not mature leading to a lessened crop yield, wildlife and livestock may become undernourished, land values could decrease, and ultimately there could be a financial loss for the farmer. Based on the 2017 Census of Agriculture, Sussex County farms had a total market value of products sold of approximately $10.8-million in crop sales and $7.4-million in livestock sales. Table 4.3.3-5 summarizes the acreage of agricultural land exposed to the drought hazard.

Table 4.3.3-5. Agricultural Land in Sussex County in 2017

Number of Farms	Land in Farms (acres)	Total Cropland (acres)	Harvested Cropland (acres)	Irrigated Land (acres)
1,008	59,766	25,671	20,441	407

Source: USDA 2017

Impact on the Environment

Droughts can impact the environment because these events can trigger wildfires, increase insect infestations, and exacerbate the spread of disease (NOAA 2020). Droughts will also impact water resources that are relied upon by aquatic and terrestrial species. Ecologically sensitive areas, such as wetlands, can be particularly vulnerable to drought periods because they are dependent on steady water levels and soil moisture availability to sustain growth. As a result, these types of habitats can be negatively impacted after long periods of dryness (NJDEP 2017).

Droughts also have the potential to lead to water pollution due to the lack of rainwater to dilute any chemicals in water sources. Contaminated water supplies may be harmful to plans and animals. If water is not getting into the soils, the ground will dry up and become unstable for plant species. Maintaining stability prevents erosion and treefall that is susceptible to catching fire and starting wildfire events (North Carolina State University 2020).

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development

As discussed in Section 3 (County Profile), areas targeted for future growth and development have been identified across Sussex County. The New Jersey Water Supply Plan indicates seasonal outdoor water use is rising statewide and is attributable to continued suburbanization and increases in residential and commercial lawn and landscape maintenance. Changes in water demands by commercial/industrial users will depend on future development of this water type use and how effectively efficiency techniques are implemented (NJDEP 2017).

Projected Changes in Population

Potable water use is the second largest water use sector and largest consumptive use in New Jersey. As such, population projections, per capital water use and percent non-residential water use by water system are important factors to consider when assessing future water needs. According to the 2018 5-year population estimates from

the American Community Survey, the population of Sussex County (i.e., 142,298 persons) has decreased by approximately 4.7-percent since 2010. Even though the population has decreased, any changes in the distribution of the population can impact the source of water resources required to sustain the user demand of each household, agricultural operation, and business operation.

Climate Change

As discussed above, most studies project that the State of New Jersey will see an increase in average annual temperatures. Additionally, the State is projected to experience more frequency droughts which may affect the availability of water supplies, primarily placing an increased stress on the population and their available potable water. Agricultural needs may increase if the climate grows warmer but may decrease if more efficient irrigation techniques are adopted broadly or if precipitation increases. A decrease in water supply, or increase in water supply demand, may increase the County's vulnerability to structural fire and wildfire events. Critical water-related service sectors may need to adjust management practices and actively manage resources to accommodate for future changes.

Vulnerability Change Since the 2016 HMP

When examining the change in the County's vulnerability to drought events from the 2016 HMP to this update, it is important to look at each entity that is exposed and vulnerable. The total population across the County has experienced a slight decrease, which can place less stress on the water supply during a drought event. However, the number of farm operations has increased since the 2012 USDA report by over 10-percent, which may increase the overall stress on the water supply during a drought event.

4.3.4 EARTHQUAKE

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the earthquake hazard in Sussex County.

2021 HMP Changes

- All subsections have been updated using best available data.
- Previous occurrences were updated with events that occurred between 2015 and 2020.
- The New Jersey Geologic and Water Survey (NJGWS) updated liquefaction data was included in the vulnerability assessment.
- Updated Hazus-MH probabilistic modeling using v4.2 was conducted using updated inventory data.
- Impacts on the environment are summarized in the vulnerability assessment.

Profile

Hazard Description

An earthquake is the sudden movement of the Earth's surface caused by the release of stress accumulated within or along the edge of the Earth's tectonic plates, a volcanic eruption, or by a manmade explosion (Federal Emergency Management Agency [FEMA] 2001; Shedlock and Pakiser 1997). Most earthquakes occur at the boundaries where the Earth's tectonic plates meet (faults); less than 10% of earthquakes occur within plate interiors. New Jersey is in an area where the rarer plate interior-related earthquakes occur. As plates continue to move and plate boundaries change geologically over time, weakened boundary regions become part of the interiors of the plates. These zones of weakness within the continents can cause earthquakes in response to stresses that originate at the edges of the plate or in the deeper crust (Shedlock and Pakiser 1997).

The location of an earthquake is commonly described by its focal depth and the geographic position of its epicenter. The focal depth of an earthquake is the depth from the Earth's surface to the region where an earthquake's energy originates, also called the focus or hypocenter. The epicenter of an earthquake is the point on the Earth's surface directly above the hypocenter (Shedlock and Pakiser 1997). Earthquakes usually occur without warning and their effects can impact areas of great distance from the epicenter (FEMA 2001).

According to the U.S. Geological Survey (USGS) Earthquake Hazards Program, an earthquake hazard is any disruption associated with an earthquake that may affect residents' normal activities. This includes surface faulting, ground shaking, landslides, liquefaction, tectonic deformation, tsunamis, and seiches; each of these terms is defined below; however, not all occur within the Sussex County planning area:

- *Surface faulting*: Displacement that reaches the earth's surface during a slip along a fault. Commonly occurs with shallow earthquakes—those with an epicenter less than 20 kilometers.
- *Ground motion (shaking):* The movement of the earth's surface from earthquakes or explosions. Ground motion or shaking is produced by waves that are generated by a sudden slip on a fault or sudden pressure at the explosive source and travel through the Earth and along its surface.
- *Landslide*: A movement of surface material down a slope.
- *Liquefaction*: A process by which water-saturated sediment temporarily loses strength and acts as a fluid, like the wet sand near the water at the beach. Earthquake shaking can cause this effect.
- *Tectonic Deformation*: A change in the original shape of a material caused by stress and strain.
- *Tsunami*: A sea wave of local or distant origin that results from large-scale seafloor displacements associated with large earthquakes, major sub-marine slides, or exploding volcanic islands.

- *Seiche*: The sloshing of a closed body of water, such as a lake or bay, from earthquake shaking (USGS 2012a).

Earthquakes can cause large and sometimes disastrous landslides and mudslides. Any steep slope is vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. Unless properly secured, hazardous materials can be released, causing significant damage to the environment and people. Earthen dams and levees are highly susceptible to seismic events and the impacts of their eventual failures can be considered secondary risks for earthquakes. Landslides are further discussed in Section 5.4.5 (Geologic Hazards) of this HMP update.

Earthquakes can also cause dam failures. The most common mode of earthquake-induced dam failure is slumping or settlement of earth-fill dams where the fill has not been property compacted. If the slumping occurs when the dam is full, then overtopping of the dam, with rapid erosion leading to dam failure is possible. Dam failure is also possible if strong ground motions heavily damage concrete dams. Earthquake-induced landslides into reservoirs have also caused dam failures.

Another secondary effect of earthquakes that is often observed in low-lying areas near water bodies is ground liquefaction. Liquefaction is the conversion of water-saturated soil into a fluid-like mass. This can occur when loosely packed, waterlogged sediments lose their strength in response to strong shaking. Liquefaction effects may occur along the shorelines of the ocean, rivers, and lakes and they can also happen in low-lying areas away from water bodies in locations where the ground water is near the earth's surface.

Tsunamis are formed as a result of earthquakes, volcanic eruptions, or landslides that occur under the ocean. When these events occur, huge amounts of energy are released as a result of quick, upward bottom movement. A wave is formed when huge volumes of ocean water are pushed upward. A large earthquake can lift large portions of the seafloor, which will cause the formation of huge waves (U.S. Search and Rescue Task Force Date Unknown).

Location

Earthquakes are most likely to occur in the northern parts of New Jersey, which includes Sussex County, where significant faults are concentrated; however, low-magnitude events can and do occur in many other areas of the State. The National Earthquake Hazard Reduction Program (NEHRP) developed five soil classifications defined by their shear-wave velocity that impact the severity of an earthquake. The soil classification system ranges from A to E, as noted in Table 4.3.4-1, where A represents hard rock that reduces ground motions from an earthquake and E represents soft soils that amplify and magnify ground shaking and increase building damage and losses.

Table 4.3.4-1. NEHRP Soil Classifications

Soil Classification	Description
A	Hard Rock
B	Rock
C	Very dense soil and soft rock
D	Stiff soils
E	Soft soils

Source: FEMA 2013

The New Jersey Department of Transportation (NJDOT) compiled a report on seismic design consideration for bridges in New Jersey, dated March 2012. In the report, NJDOT classifies the seismic nature of soils according to the American Association of State Highway and Transportation Officials (AASHTO) Guide Specifications for Bridge Seismic Design (SGS). For the purpose of seismic analysis and design, sites can be classified into

Soil Classes A, B, C, D, E and F, ranging from hard rock to soft soil and special soils (similar to the NEHRP soil classifications with an additional class F); refer to Table 4.3.4-2.

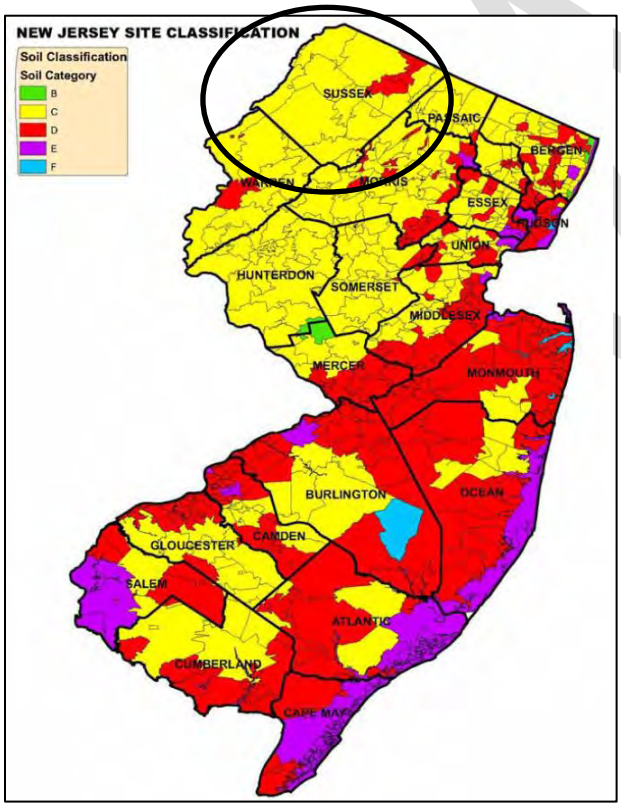
Table 4.3.4-2. NJDOT Soil Classifications

Soil Classification	Description
A-B	Rock sites
C	Very dense soil
D	Dense soil
E	Soft soil
F	Special soil requiring site-specific analysis

Source: NJDOT 2012

NJDOT also developed a Geotechnical Database Management System, which contains soil boring data across New Jersey. The soil boring logs were then used to classify soil sites. Through this analysis, NJDOT developed a map of soil site classes according to ZIP codes in New Jersey where each ZIP code was assigned a class based on its predominant soil condition. In Sussex County, most ZIP codes were rated as a Category C, and a few were rated as Category D; refer to Figure 4.3.4-1.

Figure 4.3.4-1. ZIP Code-Based Soil Site Class Map



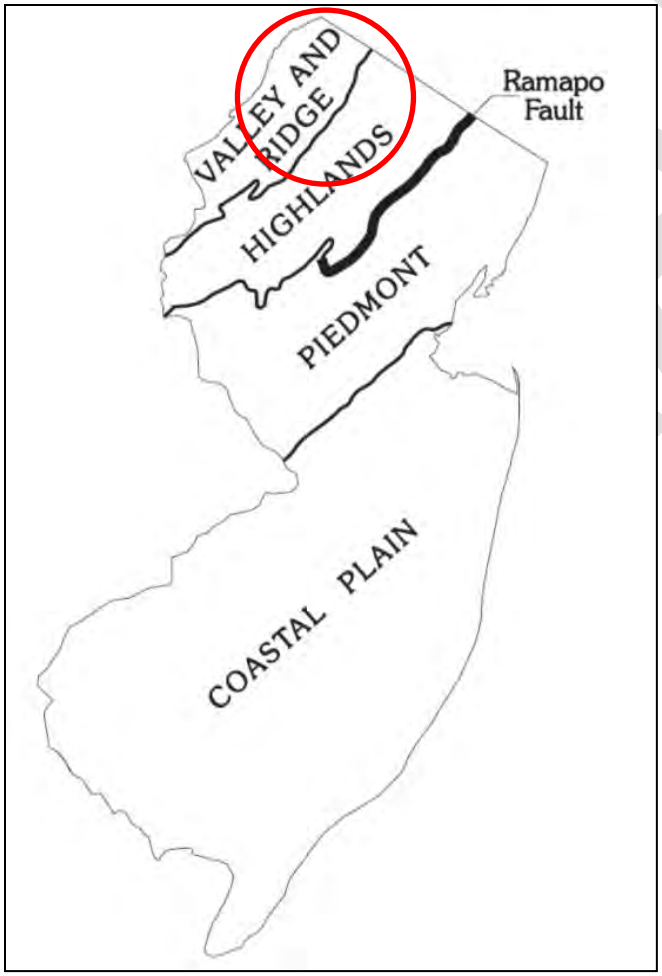
Source: NJDOT 2012
Note: Sussex County is indicated by the black circle.
Soil Classes A and B are rock sites
Soil Class C is very dense soil
Soil Class D is dense soil
Soil Class E is soft soil
Soil Class F is special soil requiring site-specific analysis

Liquefaction has been responsible for tremendous amounts of damage in historical earthquakes around the world. Shaking behavior and liquefaction susceptibility of soils are determined by their grain size, thickness, compaction, and degree of saturation. These properties, in turn, are determined by the geologic origin of the soils and their topographic position.

Liquefaction occurs in saturated soils and when it occurs, the strength of the soil decreases and the ability of a soil deposit to support foundations for buildings and bridges is reduced. Shaking from earthquakes often triggers an increase in water pressure which can trigger landslides and the collapse of dams. For information regarding dam failures, refer to Section 4.3.1 (Dam Failure) and for landslides refer to Section 4.3.6 (Geologic). Earthquakes can also contribute to landslide hazards. Earthquakes create stresses that make weak slopes fail. Earthquakes of magnitude 4.0 or greater have been known to trigger landslides.

There are many faults in New Jersey; however, the Ramapo Fault, which separates the Piedmont and Highlands Physiographic Provinces, is best known. As indicated in Figure 4.3.4-2, Sussex County might feel the effects of an earthquake along the Ramapo Fault; however, the fault itself is not located within County borders. The Reservoir Fault, which borders the Green Pond Mountain region, is another major faultline in New Jersey and is closer to Sussex County borders than the Ramapo Fault (Volkert and Witte 2015).

Figure 4.3.4-2. Physiographic Provinces of New Jersey and the Ramapo Fault Line



Source: Dombroski 1973 (revised 2005)

Note: The red circle indicates the approximate location of Sussex County. The County is part of Piedmont Province.

Extent

An earthquake's magnitude and intensity are used to describe the size and severity of the event. Magnitude describes the size at the focal point of an earthquake, and intensity describes the overall severity of shaking felt during the event. The earthquake's magnitude is a measure of the energy released at the source of the earthquake. Magnitude was formerly expressed by ratings on the Richter scale but is now most commonly expressed using the moment magnitude (Mw) scale. This scale is based on the total moment release of the earthquake (the product of the distance a fault moved and the force required to move it). The scale is as follows:

- Great Mw > 8
- Major Mw = 7.0 – 7.9
- Strong Mw = 6.0 – 6.9
- Moderate Mw = 5.0 – 5.9
- Light Mw = 4.0 – 4.9
- Minor Mw = 3.0 – 3.9
- Micro Mw = 3.0 – 3.9

The most commonly used intensity scale is the modified Mercalli intensity scale. Ratings of the scale, as well as the perceived shaking and damage potential for structures, are shown in Table 4.3.4-3. The modified Mercalli intensity scale is generally represented visually using shake maps, which show the expected ground shaking at any given location produced by an earthquake with a specified magnitude and epicenter An earthquake has only one magnitude and one epicenter, but it produces a range of ground shaking at sites throughout the region, depending on the distance from the earthquake, the rock and soil conditions at sites, and variations in the propagation of seismic waves from the earthquake due to complexities in the structure of the earth's crust. A USGS shake map shows the variation of ground shaking in a region immediately following significant earthquakes. Table 4.3.4-4 displays the MMI scale and its relationship to the areas peak ground acceleration (PGA).

Table 4.3.4-3. Modified Mercalli Intensity Scale

Mercalli Intensity	Description
I	Felt by very few people; barely noticeable.
II	Felt by few people, especially on upper floors.
III	Noticeable indoors, especially on upper floors, but may not be recognized as an earthquake.
IV	Felt by many indoors, few outdoors. May feel like passing truck.
V	Felt by almost everyone, some people awakened. Small objects move; trees and poles may shake.
VI	Felt by everyone; people have trouble standing. Heavy furniture can move; plaster can fall off walls. Chimneys may be slightly damaged.
VII	People have difficulty standing. Drivers feel their cars shaking. Some furniture breaks. Loose bricks fall from buildings. Damage is slight to moderate in well-built buildings; considerable in poorly built buildings.
VIII	Well-built buildings suffer slight damage. Poorly built structures suffer severe damage. Some walls collapse.
IX	Considerable damage to specially built structures; buildings shift off their foundations. The ground cracks. Landslides may occur.
X	Most buildings and their foundations are destroyed. Some bridges are destroyed. Dams are seriously damaged. Large landslides occur. Water is thrown on the banks of canals, rivers, and lakes. The ground cracks in large areas.
XI	Most buildings collapse. Some bridges are destroyed. Large cracks appear in the ground. Underground pipelines are destroyed.

Mercalli Intensity	Description
XII	Almost everything is destroyed. Objects are thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move.

Source: Michigan Tech University n.d.

Table 4.3.4-4. Modified Mercalli Intensity and PGA Equivalents

Modified Mercalli Intensity	Acceleration (%g) (PGA)	Perceived Shaking	Potential Damage
I	< .17	Not Felt	None
II	.17 – 1.4	Weak	None
III	.17 – 1.4	Weak	None
IV	1.4 – 3.9	Light	None
V	3.9 – 9.2	Moderate	Very Light
VI	9.2 – 18	Strong	Light
VII	18 – 34	Very Strong	Moderate
VIII	34 – 65	Severe	Moderate to Heavy

Source: Freeman et al. 2004

Note: PGA Peak Ground Acceleration

The ground experiences acceleration as it shakes during an earthquake. The peak ground acceleration (PGA) is the largest acceleration recorded by a monitoring station during an earthquake. PGA is a measure of how hard the earth shakes in a given geographic area. It is expressed as a percentage of the acceleration due to gravity (%g). Horizontal and vertical PGA varies with soil or rock type. Earthquake hazard assessment involves estimating the annual probability that certain ground accelerations will be exceeded, and then summing the annual probabilities over a time period of interest. Damage levels experienced in an earthquake vary with the intensity of ground shaking and with the seismic capacity of structures, as noted in Table 4.3.4-5.

Table 4.3.4-5. Damage Levels Experienced in Earthquakes

Ground Motion Percentage	Explanation of Damages
1-2%g	Motions are widely felt by people; hanging plants and lamps swing strongly, but damage levels, if any, are usually very low.
Below 10%g	Usually causes only slight damage, except in unusually vulnerable facilities.
10 - 20%g	May cause minor-to-moderate damage in well-designed buildings, with higher levels of damage in poorly designed buildings. At this level of ground shaking, only unusually poor buildings would be subject to potential collapse.
20 - 50%g	May cause significant damage in some modern buildings and very high levels of damage (including collapse) in poorly designed buildings.
≥50%g	May causes higher levels of damage in many buildings, even those designed to resist seismic forces.

Source: NJOEM 2019

Note: %g Peak Ground Acceleration

National maps of earthquake shaking hazards provide information for creating and updating seismic design requirements for building codes, insurance rate structures, earthquake loss studies, retrofit priorities, and land use planning. After thorough review of the studies, professional organizations of engineers update the seismic-risk maps and seismic design requirements contained in building codes (Brown et al. 2001). The USGS updated the National Seismic Hazard Maps in 2014. New seismic, geologic, and geodetic information on earthquake

rates and associated ground shaking were incorporated into these revised maps. The 2014 map represents the best available data, as determined by the USGS.

Figures 4.3.4-3 and Figure 4.3.4-4 illustrate geographic distributions of the Modified Mercalli Scale based on PGAs (%g) across Sussex County for 100- and 500-year MRP events at the census-tract level. A 100-year mean return period (MRP) event is an earthquake with 1-percent chance that mapped ground motion levels (PGA) will be exceeded in any given year. A 500-year MRP is an earthquake with 0.2 percent chance that mapped PGAs will be exceeded in any given year.

Figure 4.3.4-3. Peak Ground Acceleration 100-Year Mean Return Period for Sussex County

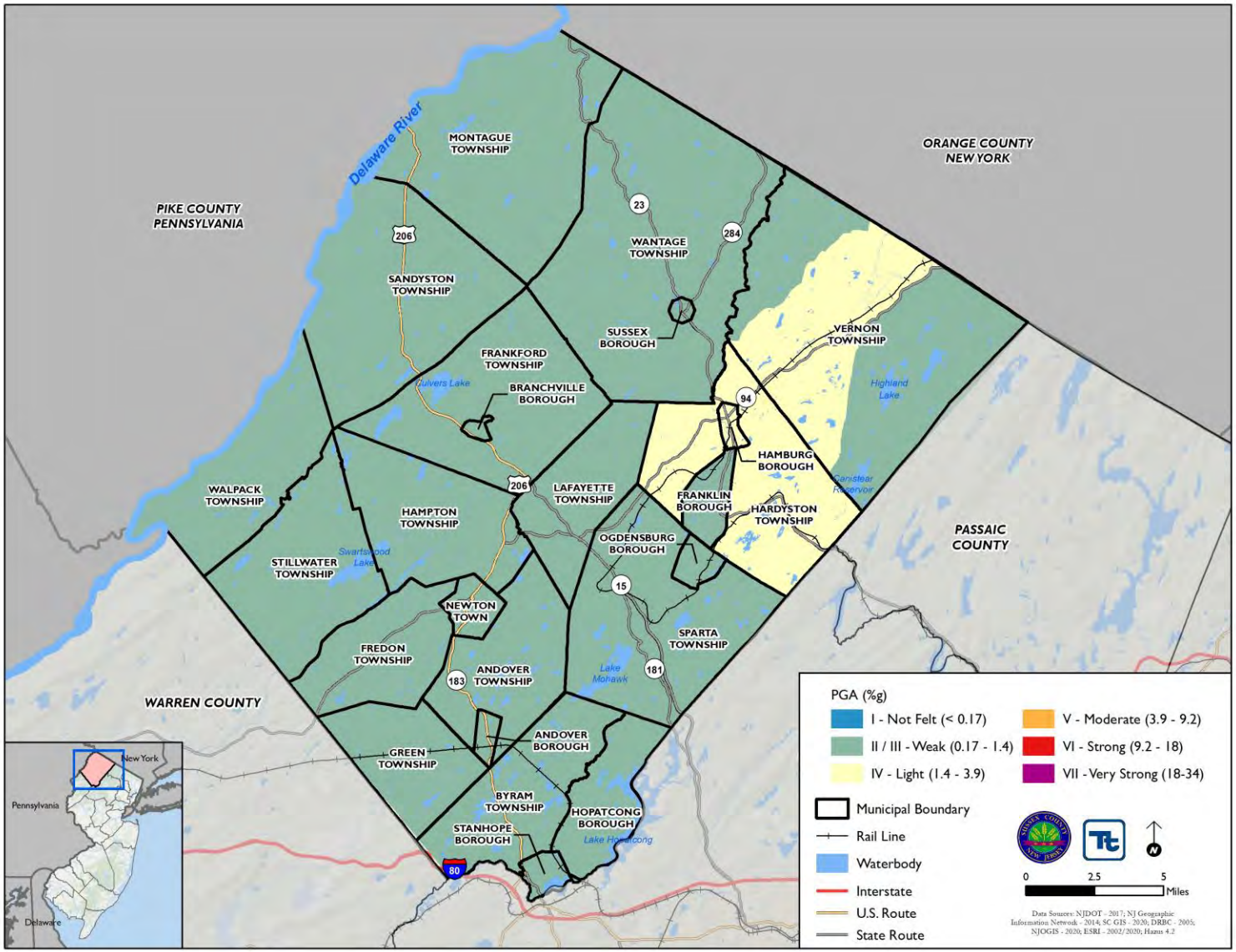
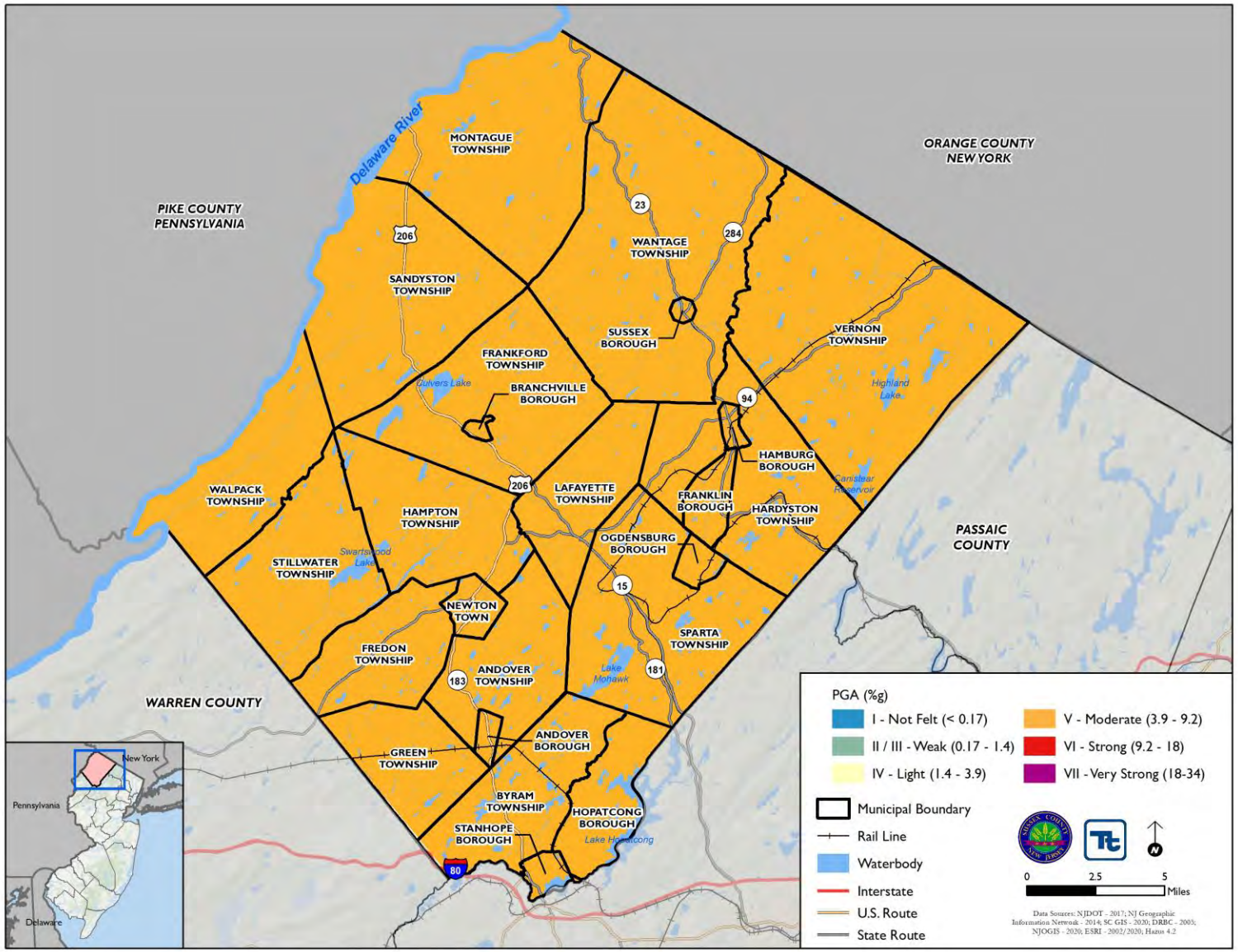


Figure 4.3.4-4. Peak Ground Acceleration 500-Year Mean Return Period for Sussex County



Previous Occurrences and Losses

FEMA Major Disasters and Emergency Declarations

Between 1954 and 2020, Sussex County has not been included in any declarations associated with earthquakes.

U.S. Department of Agriculture Disaster Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2020, Sussex County was not included in any USDA declarations associated with earthquakes.

Earthquake Events

Earthquake events that have impacted Sussex County between 2015 and 2020 are identified in Table 4.3.4-6. With earthquake documentation for New Jersey and Sussex County being so extensive, not all sources have been identified or researched. Therefore, Table 4.3.4-6 may not include all events that have occurred in the County. Please see Section 9 (Jurisdictional Annexes) for detailed information regarding impacts and losses to each municipality.

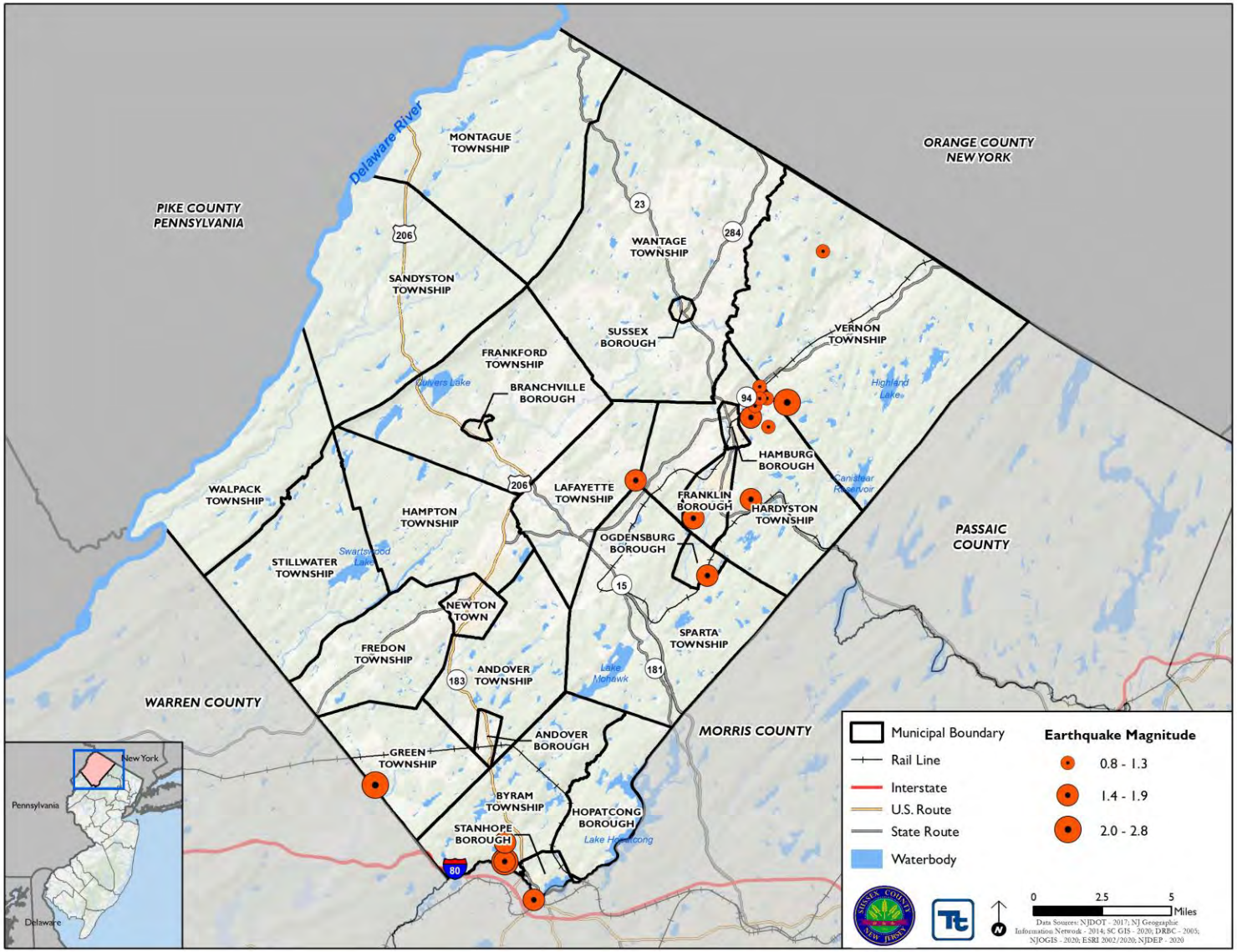
Table 4.3.4-6. Earthquake Events in Sussex County, 2015 to 2020

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
January 2, 2016	Earthquake	N/A	N/A	Ringwood, NJ	A magnitude 2.1 earthquake in Ringwood, NJ was faintly felt in eastern areas of Sussex County.
November 30, 2017	Earthquake	N/A	N/A	Dover, DE	A magnitude 4.1 earthquake in Dover, DE was felt throughout the mid-Atlantic region. The quake was felt from central Virginia to Massachusetts.
September 9, 2020	Earthquake	N/A	N/A	Marlboro, NJ	A magnitude 3.1 earthquake in Marlboro, NJ was faintly felt in Sussex County.

Source: FEMA 2020; NOAA-NCEI 2020; NWS 2020; SPC 2020; NJOEM 2019
Note: Not all events that have occurred in Sussex County are included due to the extent of documentation and the fact that not all sources have been identified or researched.
K: Thousand
DR Disaster Declaration (FEMA)
FEMA Federal Emergency Management Agency
Mph miles per hour
N/A Not Applicable

Historically, Sussex County has not experienced a major earthquake. However, there have been a number of earthquakes of relatively low intensity. The majority of earthquakes that have occurred in New Jersey have occurred along faults in the central and eastern Highlands, with the Ramapo fault being the most seismically active fault in the region (Volkert and Witte 2015); Sussex County can be impacted by earthquakes in the New Jersey Highlands. Small earthquakes may occur several times a year and generally do not cause significant damage. The largest earthquake to impact Sussex County was a magnitude 5.3 earthquake that was epicentered west of New York City. It was felt from New Hampshire to Pennsylvania (Stover and Coffman 1993; NJGWS 2015). Figure 4.3.4-5 illustrates earthquake events where the epicenters were located in New Jersey.

Figure 4.3.4-5. Earthquakes with Epicenters in Sussex County



Probability of Future Occurrences

Earthquakes cannot be predicted and may occur any time of the day or year. Major earthquakes are infrequent in the State and County and may occur only once every few hundred years or longer, but the consequences of major earthquakes may potentially be very high. Based on the historic record, the future probability of damaging earthquakes impacting Sussex County is low.

In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for earthquake in the County is considered 'rare' (between 1 and 10 percent annual probability of a hazard event occurring, as presented in Table 4.4-1). The ranking of the earthquake hazard for individual municipalities is presented in the jurisdictional annexes.

Climate Change Impacts

The potential impacts of global climate change on earthquake probability are unknown. Some scientists feel that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the Earth's crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity according to research into prehistoric earthquakes and volcanic activity. National Aeronautics and Space Administration (NASA) and USGS scientists found that retreating glaciers in southern Alaska might be opening the way for future earthquakes (NJOEM 2019).

Secondary impacts of earthquakes could be magnified by future climate change. Soils saturated by repetitive storms could experience liquefaction during seismic activity because of the increased saturation. Dams storing increased volumes of water from changes in the hydrograph could fail during seismic events. There are currently no models available to estimate these impacts (NJOEM 2019).

Vulnerability Assessment

A probabilistic assessment was conducted for the 100-year and 500-year MRP events through a Level 2 analysis in Hazus v4.2 to analyze the earthquake hazard and provide a range of loss estimates. Refer to Section 4.2 (Methodology) for additional details on the methodology used to assess earthquake risk.

Impact on Life, Health, and Safety

The entire County may experience an earthquake. However, the degree of impact is dependent on many factors including the age and type of construction people live in, the soil types their homes are located on, and the intensity of the earthquake. Whether directly or indirectly impacted, residents could be faced with business closures, road closures that could isolate populations, and loss of function of critical facilities and utilities.

Overall, risk to public safety and loss of life from an earthquake in the County is minimal for low magnitude events. However, there is a higher risk to public safety for those inside buildings due to structural damage or people walking below building ornamentations and chimneys that may be shaken loose and fall because of an earthquake. NEHRP Soil Classes D and E amplify ground shaking to damaging levels even during a moderate earthquake, and thus increase risk to the population. As Figure 4.3.4-1 demonstrates, softer soils are more prevalent in the northeast portion of the County, making the population in this area more vulnerable to an earthquake event.

Populations considered most vulnerable are those located in/near the built environment, particularly those near unreinforced masonry construction. Of these most vulnerable populations, socially vulnerable populations, including the elderly (persons over age 65) and individuals living below the poverty threshold, are most susceptible. Factors leadings to this higher susceptibility include decreased mobility and financial ability to react or respond during a hazard, and the location and construction quality of their housing. According to the 2014 – 2018 5-year American Community Survey (ACS) estimates, there are 7,191 total persons living below the poverty level and 22,889 persons over the age of 65 years in Sussex County.

As a result of an earthquake event, residents may be displaced or require temporary to long-term sheltering. The number of people requiring shelter is generally less than the number displaced as some displaced persons use hotels or stay with family or friends following a disaster event. Hazus estimates that there will be zero displaced households and zero persons seeking short-term sheltering caused by the 100-year and 500-year MRP events.

According to the 1999-2003 NYCEM Summary Report (*Earthquake Risks and Mitigation in the New York / New Jersey / Connecticut Region*), a strong correlation exists between structural building damage and number of injuries and casualties from an earthquake event. Further, the time of day also exposes different sectors of the community to the hazard. For example, Hazus considers the residential occupancy at its maximum at 2:00 a.m., where the educational, commercial, and industrial sectors are at their maximum at 2:00 p.m., with peak commute time at 5:00 p.m. Whether directly impacted or indirectly impact, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could prevent people from working, road closures could isolate populations, and loss of functions of utilities could impact populations that suffered no direct damage from an event itself. Overall, Hazus estimates that there are no injuries or casualties caused by the 100-year MRP event and seven injuries caused by the 500-year MRP event (i.e., one injury during the 2AM commute, four injuries during the 2PM commute, and two injuries during the 5PM commute).

Impact on General Building Stock

The entire County's general building stock is considered at risk and exposed to this hazard. Soft soils (NEHRP Soil Classes D and E) can amplify ground shaking to damaging levels even during a moderate earthquake.

Therefore, buildings located on NEHRP Classes D (Figure 4.3.4-1) soils are at increased risk of damage from an earthquake.

There is a strong correlation between PGA and damage a building might undergo (New Jersey 2019). The Hazus model is based on best available earthquake science and aligns with these statements. The Hazus probabilistic earthquake model was applied to analyze effects from the earthquake hazard on general building stock in Sussex County. Refer to Figures 4.3.4-3 and 4.3.4-4 earlier in this profile which illustrates the geographic distribution of PGA (g) across the County for 100-year and 500-year MRP events at the Census-tract level.

A building's construction determines how well it can withstand the force of an earthquake. Unreinforced masonry buildings are most at risk during an earthquake because the walls are prone to collapse outward, whereas steel and wood buildings absorb more of the earthquake's energy. Additional attributes that affect a building's capability to withstand an earthquake's force include its age, number of stories, and quality of construction. Hazus considers building construction and age of building as part of the analysis. Because a custom general building stock was used for this Hazus analysis, the building ages and building types from the inventory were incorporated into the Hazus model.

Potential building damage was evaluated by Hazus across the following damage categories: none, slight, moderate, extensive, and complete. Table 4.3.4-7 provides definitions of these five categories of damage for a light wood-framed building. Definitions for other building types are included in the Hazus technical manual documentation. The results of potential damage states for buildings in Sussex County categorized by general occupancy classes (i.e., residential, commercial, industrial, etc.) from Hazus are summarized in Table 4.3.4-8 for the 500-year MRP event. Hazus estimates that there are zero damages to structures caused by the 100-year MRP event.

Table 4.3.4-7 Example of Structural Damage State Definitions for a Light Wood-Framed Building

Damage Category	Description
Slight	Small plaster or gypsum-board cracks at corners of door and window openings and wall-ceiling intersections; small cracks in masonry chimneys and masonry veneer.
Moderate	Large plaster or gypsum-board cracks at corners of door and window openings; small diagonal cracks across shear wall panels exhibited by small cracks in stucco and gypsum wall panels; large cracks in brick chimneys; toppling of tall masonry chimneys.
Extensive	Large diagonal cracks across shear wall panels or large cracks at plywood joints; permanent lateral movement of floors and roof; toppling of most brick chimneys; cracks in foundations; splitting of wood sill plates and/or slippage of structure over foundations; partial collapse of room-over-garage or other soft-story configurations.
Complete	Structure may have large permanent lateral displacement, may collapse, or be in imminent danger of collapse due to cripple-wall failure or the failure of the lateral load resisting system; some structures may slip and fall off the foundations; large foundation cracks.

Source: Hazus Technical Manual

Table 4.3.4-8. Estimated Buildings Damaged by General Occupancy for the 500-Year MRP Earthquake Event

Occupancy Class	Total Number of Buildings in Occupancy	Severity of Expected Damage	500-Year MRP Event	
			Building Count	Percent Buildings in Occupancy Class
Residential Exposure (Single and Multi-Family Dwellings)	62,429	None	61,844	99.1%
		Minor	535	0.9%
		Moderate	49	0.1%
		Severe	1	0.0%

Occupancy Class	Total Number of Buildings in Occupancy	Severity of Expected Damage	500-Year MRP Event	
			Building Count	Percent Buildings in Occupancy Class
		Complete Destruction	0	0.0%
Commercial Buildings	3,304	None	3,266	98.8%
		Minor	30	0.9%
		Moderate	7	0.2%
		Severe	1	0.0%
		Complete Destruction	0	0.0%
Industrial Buildings	258	None	249	96.5%
		Minor	7	2.7%
		Moderate	2	0.8%
		Severe	0	0.0%
		Complete Destruction	0	0.0%
Government, Religion, Agricultural, and Education Buildings	6,030	None	5,974	99.1%
		Minor	50	0.8%
		Moderate	6	0.1%
		Severe	0	0.0%
		Complete Destruction	0	0.0%

Source: Sussex County GIS 2020; Hazus; NJDOT 2012

Building damage as a result of the 100-year and 500-year MRP earthquakes were estimated for each municipality using Hazus. Hazus estimates that zero damages will occur to buildings and contents during the 100-year MRP event. Table 4.3.4-9 estimates total building and content losses caused by the 500-year MRP event by jurisdiction. This table also summarizes losses for structures categorized as residential, commercial, and all other occupancy classes. Less than 0.1-percent of the County's structures are impacted by the 500-year MRP event (i.e., approximately $22.1 million in replacement cost value). A majority of the losses are estimated to occur in the Township of Sparta ($3.2 million).

Table 4.3.4-9. Estimated Building Damages (Structure and Contents) from the 500-year MRP Earthquake Event

Jurisdiction	Replacement Cost Value (RCV)	500-Year MRP				
		Estimated Total Damage	Percent of Total Building and Contents Replacement Cost Value	Estimated Residential Damage	Estimated Commercial Damage	Estimated Damages for All Other Occupancies
Andover (B)	$628,463,030	$138,206	<0.1%	$41,366	$75,478	$21,362
Andover (Twp)	$3,609,679,724	$1,211,956	<0.1%	$295,663	$687,218	$229,075
Branchville (B)	$532,377,368	$137,604	<0.1%	$40,001	$50,678	$46,924
Byram (Twp)	$2,746,550,446	$912,777	<0.1%	$379,598	$409,542	$123,637
Frankford (Twp)	$3,129,888,305	$849,244	<0.1%	$315,353	$291,281	$242,610
Franklin (B)	$1,921,211,856	$733,079	<0.1%	$274,199	$299,511	$159,369
Fredon (Twp)	$1,372,050,934	$373,196	<0.1%	$167,578	$34,723	$170,895
Green (Twp)	$1,598,635,804	$464,353	<0.1%	$221,292	$36,158	$206,903
Hamburg (B)	$1,588,049,291	$1,375,141	0.1%	$300,503	$768,323	$306,315
Hampton (Twp)	$2,196,131,598	$648,121	<0.1%	$239,795	$212,162	$196,163
Hardyston (Twp)	$3,183,033,542	$1,619,332	0.1%	$613,578	$678,706	$327,048
Hopatcong (B)	$2,888,571,676	$1,055,355	<0.1%	$651,629	$239,749	$163,977
Lafayette (Twp)	$1,958,174,065	$568,466	<0.1%	$149,711	$145,237	$273,518
Montague (Twp)	$1,459,611,020	$382,419	<0.1%	$154,030	$112,671	$115,718
Newton (T)	$5,093,275,807	$1,781,932	<0.1%	$409,696	$931,264	$440,971
Ogdensburg (B)	$819,879,629	$332,147	<0.1%	$116,702	$126,672	$88,773
Sandyston (Twp)	$1,212,626,664	$311,623	<0.1%	$87,694	$74,144	$149,785
Sparta (Twp)	$9,070,094,285	$3,166,510	<0.1%	$1,095,870	$1,556,912	$513,728
Stanhope (B)	$1,051,183,581	$434,431	<0.1%	$181,702	$107,122	$145,606
Stillwater (Twp)	$1,417,579,398	$345,260	<0.1%	$181,040	$53,910	$110,310
Sussex (B)	$1,945,578,916	$696,643	<0.1%	$145,135	$463,241	$88,267

Jurisdiction	Replacement Cost Value (RCV)	500-Year MRP				
		Estimated Total Damage	Percent of Total Building and Contents Replacement Cost Value	Estimated Residential Damage	Estimated Commercial Damage	Estimated Damages for All Other Occupancies
Vernon (Twp)	$5,658,971,163	$3,107,545	0.1%	$1,679,595	$649,630	$778,320
Walpack (Twp)	$63,691,550	$10,401	<0.1%	$2,927	$2,475	$4,999
Wantage (Twp)	$4,877,543,885	$1,488,367	<0.1%	$539,289	$365,878	$583,200
Sussex County (Total)	**$60,022,853,539**	**$22,144,106**	**<0.1%**	**$8,283,949**	**$8,372,687**	**$5,487,470**

Source: Sussex County GIS 2020; RS Means 2020; Hazus; NYS n.d.
Notes: B – Borough; T – Town; Twp. – Township; % - Percent

Historically, Building Officials Code Administration (BOCA) regulations in the northeast states were developed to address local concerns, including heavy snow loads and wind. Seismic requirements for design criteria are not as stringent as those of the west coast of the United States, which rely on the more seismically focused Uniform Building Code. As such, a smaller earthquake in the northeast can cause more structural damage than if it would occur in the west.

Impact on Critical Facilities

All critical facilities in Sussex County are considered exposed to the earthquake hazard. Refer to subsection "Critical Facilities" in Section 3 (County Profile) of this HMP for a complete inventory of critical facilities in Sussex County.

The Hazus earthquake model was used to assign the range or average probability of each damage state category to the critical facilities in Sussex County for the 100-year and 500-year MRP events. In addition, Hazus estimates the time to restore critical facilities to fully functional use. Results are presented as a probability of being functional at specified time increments (days after the event). For example, Hazus might estimate that a facility has 5% chance of being fully functional at Day 3, and a 95% chance of being fully functional at Day 90. For percent probability of sustaining damage, the minimum and maximum damage estimated value for that facility type is presented.

As a result of a 100-year MRP event, Hazus estimates that critical facilities will be nearly 100-percent functional with negligible damages. Therefore, the impact to critical facilities is not significant for the 100-year MRP event. Whereas, for the 500-year MRP events, functionality can approximately decrease as low as 4.2-percent. Table 4.3.4-10 summarizes the damage state probabilities for critical facilities during the 500-year MRP event.

Table 4.3.4-10. Estimated Damage and Loss of Functionality for Critical Facilities and Utilities in Sussex County for the 500-Year MRP Earthquake Event

Name	Percent Probability of Sustaining Damage					Percent Functionality			
	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Critical Facilities									
EOC	99.1-99.3%	0.8%	0.1%	0.0%	0.0%	99.2%	99.9%	99.9%	99.9%
Medical	99.2%	0.8%	0.0%	0.0%	0.0%	99.1%	99.9%	99.9%	99.9%
Police	95.9-97.7%	1.4-2.4%	0.8-1.5%	0.1-0.3%	0.0%	95.9-97.6%	98.1-99.0%	99.8%	99.9%
Fire	95.9-97.9%	1.2-2.4%	0.7-1.5%	0.1-0.3%	0.0%	95.9-97.9%	98.1-99.1%	99.8%	99.9%
Schools	97.4-98.6%	1.0-1.8%	0.3-0.8%	0.1%	0.0%	97.3-98.6%	99.5%	99.9%	99.9%
Utilities									
Potable Water	95.9-98.0%	1.2-2.3%	0.7-1.5%	0.1-0.3%	0.0%	97.7-99.2%	99.8%	99.9%	99.9%
Waste Water	96.1-97.7%	1.4-2.3%	0.8-1.4%	0.1-0.3%	0.0%	96.9-98.2%	99.8%	99.9%	99.9%
Communication	95.8-99.2%	0.7-2.8%	0.0-1.2%	0.0%-0.1%	0.0%	99.9%	99.9%	99.9%	99.9%
Electric Power	96.1-98.0%	1.2-2.3%	0.7-1.4%	0.1-0.3%	0.0%	97.3-98.6%	99.9%	99.9%	99.9%
Natural Gas Facility	97.2%	0.1%	0.0%	0.0%	0.0%	98.9%	99.9%	99.9%	99.9%
Transportation									
Airport Facility	99.2%	0.8%	0.0%	0.0%	0.0%	99.9%	99.9%	99.9%	99.9%

Source: Hazus; Sussex County GIS 2020
Notes: EOC = Emergency Operations Center; MRP = Mean Return Period; % - Percent

Impact on Economy

Earthquakes also have impacts on the economy, including loss of business function, damage to inventory, relocation costs, wage loss, and rental loss due to the repair/replacement of buildings. Hazus estimates building-related economic losses, including income losses (wage, rental, relocation, and capital-related losses) and capital stock losses (structural, non-structural, content, and inventory losses). Economic losses estimated by Hazus are summarized in Table 4.3.4-11.

Table 4.3.4-11. Economic Losses for Earthquake MRP Events

Mean Return Period (MRP)	Inventory Loss	Relocation Loss	Building and Content Losses	Wages Losses	Rental Losses	Capital-Related Loss
100-year MRP	$0	$0	$0	$0	$0	$0
500-year MRP	$172,600	$1,213,800	$22,143,500	$551,600	$643,000	$322,700

Source: Hazus; RS Means 2020

Although the Hazus analysis did not compute damage estimates for individual roadway segments and railroad tracks, assumedly these features would undergo damage due to ground failure, resulting in interruptions of regional transportation and of distribution of materials. Losses to the community that would result from damage to lifelines could exceed costs of repair. Earthquake events can also significantly affect road bridges, many of which provide the only access to certain neighborhoods. Because softer soils generally follow floodplain boundaries, bridges that cross watercourses should be considered vulnerable. Another key factor in degree of vulnerability is age of facilities and infrastructure, which correlates with standards in place at times of construction.

Hazus also estimates the volume of debris that may be generated as a result of an earthquake event to enable the study region to prepare and rapidly and efficiently manage debris removal and disposal. Debris estimates are divided into two categories: (1) reinforced concrete and steel that require special equipment to break it up before it can be transported, and (2) brick, wood, and other debris that can be loaded directly onto trucks with bulldozers (Hazus-MH Earthquake User's Manual 2020).

For the 100-year MRP event, Hazus estimates that zero tons of debris will be generated. For the 500-year MRP event, Hazus estimates a total of 3,596 tons of debris will be generated county-wide. Table 5.4.4-4.3.5-6 and Table 5.4.4-4.3.5-6 summarizes the estimated debris generated as a result of these events by municipality.

Table 4.3.4-12. Estimated Debris Generated by the 500-Year MRP Earthquake Events

Jurisdiction	500-Year	
	Brick/Wood (tons)	Concrete/Steel (tons)
Andover (B)	11	9
Andover (Twp)	97	69
Branchville (B)	11	4
Byram (Twp)	71	37
Frankford (Twp)	77	25
Franklin (B)	126	23
Fredon (Twp)	34	15
Green (Twp)	67	10

Jurisdiction	500-Year	
	Brick/Wood (tons)	Concrete/Steel (tons)
Hamburg (B)	209	82
Hampton (Twp)	85	26
Hardyston (Twp)	157	71
Hopatcong (B)	113	31
Lafayette (Twp)	57	11
Montague (Twp)	47	16
Newton (T)	313	100
Ogdensburg (B)	67	10
Sandyston (Twp)	48	10
Sparta (Twp)	363	68
Stanhope (B)	62	42
Stillwater (Twp)	42	6
Sussex (B)	101	36
Vernon (Twp)	423	75
Walpack (Twp)	2	0
Wantage (Twp)	159	78
Sussex County (Total)	**2,741**	**855**

Source: Hazus
Notes: B – Borough; T – Town; Twp. – Township

Impact on the Environment

According to USGS, earthquakes can cause damage to the surface of the Earth in various forms depending on the magnitude and distribution of the event (USGS 2020). Surface faulting is one of the major seismic components to earthquakes that can create wide ruptures in the ground. Ruptures can have a direct impact on the landscape and natural environment because it can disconnect habitats for miles isolating animal species or tear apart plant roots.

Furthermore, ground failure as a result of soil liquefaction can have an impact on soil pores and retention of water resources (USGS 2020). The greater the seismic activity and liquefaction properties of the soil, the more likely drainage of groundwater can occur which depletes groundwater resources. In areas where there is higher pressure of groundwater retention, the pores can build up more pressure and make soil behave more like a fluid rather than a solid increasing risk of localized flooding and deposition or accumulation of silt.

Future Growth and Development

Understanding future changes that effect vulnerability in the County can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

As discussed and illustrated in Section 3 (County Profile), areas targeted for future growth and development have been identified across the County. Development built in areas with softer NEHRP soil classes, liquefaction, and landslide-susceptible areas may experience shifting or cracking in the foundation during earthquakes because of the loose soil characteristics of these soil classes. However, current building codes require seismic provisions that should render new construction less vulnerable to seismic impacts than older, existing construction that may have been built to lower construction standards. Refer to Section 3, and Volume II Section 9 for more information about the potential new development in Sussex County.

Projected Changes in Population

Sussex County has experienced population decline since 2010. According to the U.S. Census Bureau, the County's population has decreased 4.7-percent between 2010 and 2018 (U.S. Census Bureau 2020). The Township of Walpack and the Borough of Sussex have experienced the greatest decline with a decrease of 62.5-percent and 13.0-percent, respectively. The population is expected to continue to decrease as residents move away from the suburbs and towards urban centers (Stirling 2018). Even though the population has decreased, any changes in the density of population can impact the number of persons exposed to the earthquake hazard. Persons that move into older buildings may increase their overall vulnerability to earthquakes. As noted earlier, if moving into new construction, current building codes require seismic provisions that should render new construction less vulnerable to seismic impacts.

Climate Change

Because the impacts of climate change on earthquakes are not well understood, a change in the County's vulnerability as the climate continues to change is difficult to determine. However, climate change has the potential to magnify secondary impacts of earthquakes. As a result of the climate change projections discussed above, the County's assets located on areas of saturated soils and on or at the base of steep slopes, are at a higher risk of landslides/mudslides because of seismic activity. Refer to Section 4.3.6 for additional discussion of the geological hazard.

Vulnerability Change Since the 2016 HMP

Overall, the entire County continues to be vulnerable to earthquakes. For the 2021 HMP, the exposure analyses were conducted using 2014-2018 American Community Survey 5-year population estimates. The building inventory was updated using RS Means 2020 values, which is more current and reflects replacement cost versus the building stock improvement values reported in the 2016 HMP. Additional building stock updates include updates to the critical facility inventory provided by Sussex County. Furthermore, since the 2016 HMP, an updated version of Hazus was released (v4.2). This updated model includes longer historical records to pull from to generate probabilistic events. Further, a NEHRP boundary was created for NEHRP soil class D using the NJDOT Soil Classification map (Figure 4.3.4-1).

4.3.5 FLOOD

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the flood hazard in Sussex County.

2021 HMP Changes

- All subsections have been updated using best available data.
- The urban flooding discussion and problem areas was expanded.
- Previous events between 2015 and 2020 are listed with a comprehensive list of previous events in Appendix E (Risk Assessment Supplement).
- The vulnerability assessment was updated utilizing updated and expanded building, critical facility and community lifeline inventories.

Profile

Hazard Description

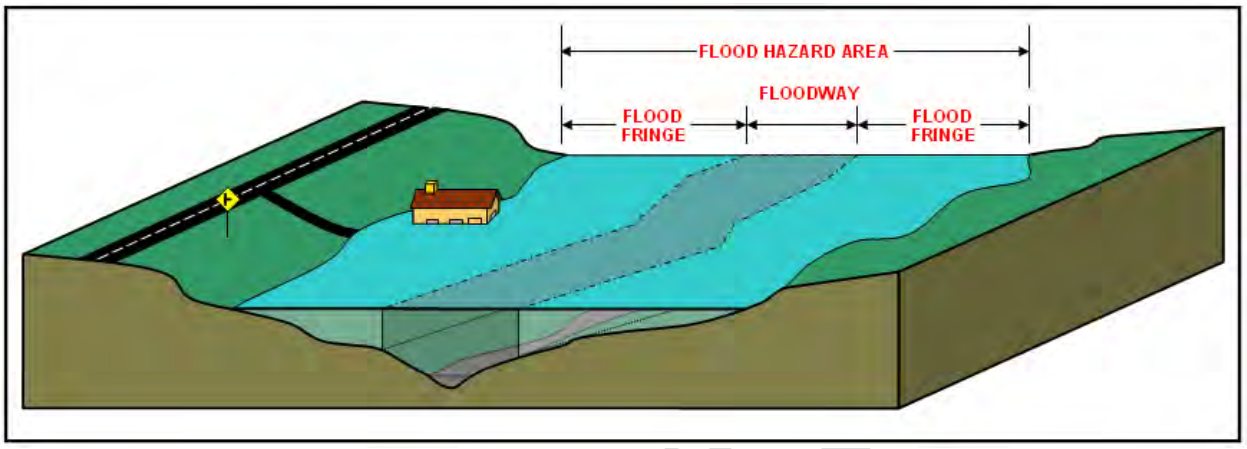
A flood is the inundation of normally dry land resulting from the rising and overflowing of a body of water. They can develop slowly over a period of days or develop quickly, with disastrous effects that can be local (impacting a neighborhood or community) or regional (affecting entire river basins, coastlines and multiple counties or states) (FEMA 2007). Floods are frequent and costly natural hazards in New Jersey in terms of human hardship and economic loss, particularly to communities that lie within flood-prone areas or floodplains of a major water source.

The flood-related hazards most likely to impact Sussex County are riverine (inland) flooding, ice jam flooding, and flooding as a result of a dam failure. Dam failure is discussed in Section 4.3.1 (Dam Failure). In addition, Sussex County also experiences urban flooding which is the result of precipitation and insufficient drainage.

Riverine (Inland) Flooding

A floodplain is defined as the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that becomes inundated with water during a flood. In Sussex County, floodplains line the rivers, streams, and lakes of the County. The boundaries of the floodplains are altered as a result of changes in land use, the amount of impervious surface, placement of obstructing structures in floodways, changes in precipitation and runoff patterns, improvements in technology for measuring topographic features, and utilization of different hydrologic modeling techniques. Figure 4.3.5-1 depicts the flood hazard area, the flood fringe, and the floodway areas of a floodplain.

Figure 4.3.5-1. Floodplain



Source: New Jersey Department of Environmental Protection (NJDEP) Date Unknown

Ice Jam Flooding

As per the Northeast States Emergency Consortium and FEMA, an ice jam is an accumulation of ice that acts as a natural dam and restricts flow of a body of water. Ice jams occur when warm temperatures and heavy rains cause rapid snowmelt. The melting snow, combined with the heavy rain, causes frozen rivers to swell. The rising water breaks the ice layers into large chunks, which float downstream and often pile up near narrow passages and obstructions (bridges and dams). Ice jams may build up to a thickness great enough to raise the water level and cause flooding (FEMA 2015a). Ice jams may also be caused by frazil ice, which forms when mist freezes and then floats down a river, stream, or creek.

There are two different types of ice jams: freeze-up and breakup. Freeze-up jams occur in the early to mid-winter when floating ice may slow or stop due to a change in water slope as it reaches an obstruction to movement. Breakup jams occur during periods of thaw, generally in late winter and early spring. The ice cover breakup is usually associated with a rapid increase in runoff and corresponding river discharge due to a heavy rainfall, snowmelt, or warmer temperatures (White 2013).

Urban Flooding

Heavy rainfall that overwhelms a developed area's stormwater infrastructure causing flooding is commonly referred to as urban flooding. Urban flooding can be worsened by aging and inadequate infrastructure and over development of land. The growing number of extreme rainfall events that produce intense precipitation are resulting in increased urban flooding (Center for Disaster Resilience 2016). While riverine and coastal flooding is mapped and studied by FEMA, urban flooding is not.

NOAA defines urban flooding as the flooding of streets, underpasses, low lying areas, or storm drains. (NOAA 2009). Urban drainage flooding is caused by increased water runoff due to urban development and inadequate drainage systems. Drainage systems are designed to remove surface water from developed areas as quickly as possible to prevent localized flooding on streets and other urban areas. The systems make use of a closed conveyance system that channels water away from an urban area to surrounding streams. This bypasses the natural processes of water filtration through the ground, containment, and evaporation of excess water. Because drainage systems reduce the amount of time the surface water takes to reach surrounding streams, flooding in

those streams can occur more quickly and reach greater depths than prior to development in that area (Harris 2008).

High groundwater levels can be a concern and cause problems even where there is no surface flooding. Basements are susceptible to high groundwater levels. Seasonally high groundwater is common in many areas, while elsewhere high groundwater occurs only after a long period of above-average precipitation (FEMA 1997).

Location

Flooding potential is influenced by climatology, meteorology and topography. Extensive development can impact flooding potential as it leaves fewer natural surfaces available to absorb rainwater, forcing water directly into streams, rivers, and existing drainage systems swelling them more than when more natural surface buffered the runoff rate.

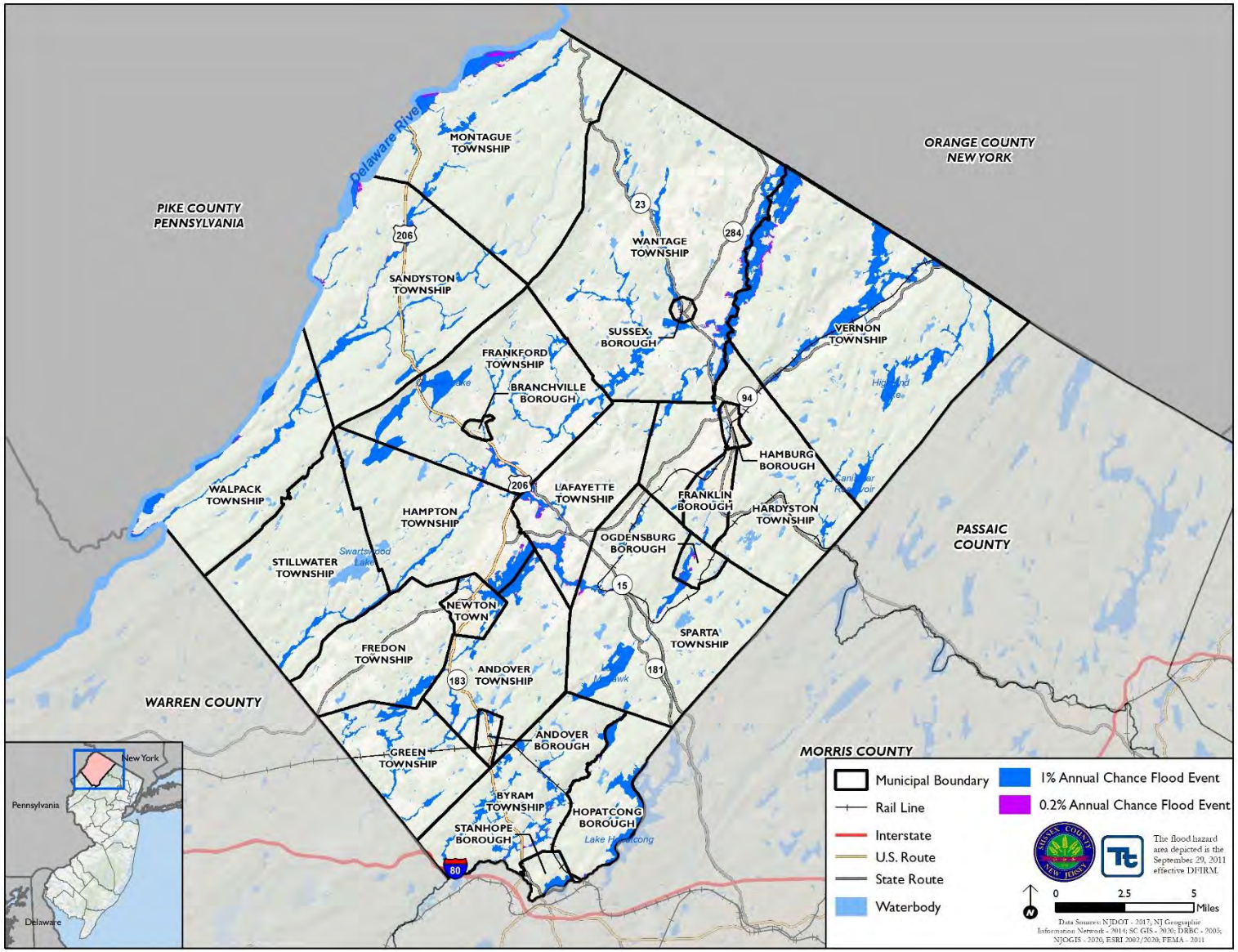
Flooding in Sussex County is often the direct result of frequent weather events such as thunderstorms, heavy rains, tropical storms, and hurricanes. Floods can happen almost anywhere in County, although they do tend to occur in and around areas near existing bodies of water, such as rivers and streams. The most damaging floods (particularly riverine floods) in New Jersey appear to occur in the northern half of the State, which includes Sussex County. This is a function of several physiographic and physical features of the landscape. Greater geographic relief in the northern half results in flowing water moving down steeper gradients and being naturally or artificially channelized through valleys and gullies.

Sussex County has primarily a mountainous terrain, with significant exposure to water and vulnerability to the flood hazard. Sussex County has several large waterways, including the Musconetcong River and Paulins Kill, as well as the Delaware River, which has a total drainage area of over 14,000 square miles. Larger lakes and reservoirs include Lake Hopatcong, Lake Musconetcong and Lake Mohawk (FEMA FIS 2011). Over the years, Sussex County has been impacted by flooding, especially in the municipalities situated adjacent to these bodies of water.

Development patterns have resulted in denser development in northern New Jersey. In addition, proximity to New York City boosts property values and therefore increases damage dollar totals. Extensive development also leaves fewer natural surfaces available to absorb rainwater, forcing water directly into streams and rivers, swelling them more than when more natural surface buffered the runoff rate. Since the Delaware, Raritan, and Passaic Rivers drain more than 90 percent of the northern New Jersey counties, these rivers and their tributaries are common locations for flooding.

The 1-percent annual chance flood hazard zones are widely dispersed in Sussex County, generally following riverine corridors as shown in Figure 4.3.5-2. A significant concentration of 1 percent annual chance flood hazard zones is located in the northeastern portion of the County, around the Wallkill River, and the Pochuck and Wawayanda Creeks, especially as they near the New York State border in Wantage and Vernon Townships, respectively. Additional 1-percent annual chance flood hazard zones exist along Lake Hopatcong as it forms the southeastern Sussex County boundary with Morris County, around Lake Mohawk in Sparta Township, and along Moore's Brook in Andover and Hampton Townships. In addition, 1-percent annual chance floodplains are scattered throughout the County tracing the footprints of numerous other creeks, rivers, and bodies of water, as shown in Figure 4.3.5-2 below.

Figure 4.3.5-2. FEMA 2011 Flood Hazard Areas in Sussex County



Flood-Prone Areas in Sussex County

Watersheds in New Jersey are referred to as the name of the water body to which the land area drains and the corresponding Hydrologic Unit Code (HUC). The HUC can range from 2 to 16 digits long- the longer the numeric code, the smaller the watershed area. NJDEP also has divided the state into 21 Watershed Management Areas (WMAs) based on large scale drainage pattern. Each WMA encompasses a particular group of major rivers. Sussex County falls within parts of 4 regions: WMA 01: Upper Delaware - Northwest Region; WMA 02: Wallkill - Northwest Region; WMA 03: Pompton, Pequannock, Wanaque, Ramapo - Northeast Region; and WMA 06: Middle Passaic, Whippany – Northeast Region. These areas delineate the principal stream systems that drain the county's land area. WMA 1, the Upper Delaware River Watershed, is the largest watershed in the county by area, with waters draining west and southwest to the Delaware River. The second largest is WMA 2, the Wallkill River Watershed. The Wallkill, which flows north into Orange County, New York, drains the north-central and northeastern section of Sussex County. WMA 3 (Pequannock River Watershed) and WMA 6 (Rockaway River Watershed) both drain to the southeast, and comprise small parts of the county.

Please refer to Section 9 for information regarding specific areas of flooding within each municipality.

Watershed Management Area 01 – Upper Delaware River

Located in the western and southern sections of Sussex County, the Upper Delaware River Watershed comprises greater than half of the County's land area, and includes the following principal waterways: the Flat Brook; the Paulins Kill; the Pequest River and a short stretch of the Musconetcong River. Waterways in WMA 01 run southwesterly, roughly parallel to one another, towards the Delaware River. Montague and Sandyston townships contain a large amount of these waterways, most of which are streams part of the Big and Little Flat Brook systems. The upper half of the Big Flat Brook flows through High Point State Park and Stokes State Forest. Clove Brook and Mill Brook also run through Montague Township. Walpack Township contains tributaries of the Flat Brook draining the west slope of the Kittatinny Ridge. Other waterways in this area include several stretches and tributaries of the Paulins Kill, Pequest River and Musconetcong River in Stillwater, Fredon, Green and Byram Townships, as well as parts of Kymer Brook and Lubbers Run (Sussex County 2015).

Watershed Management Area 02 – Wallkill River

The Wallkill River watershed occupies the northern and northeastern parts of Sussex County, extending south through Sparta and northern Byram Townships. The Wallkill River flows northeast across the NJ state border and lets out on the Hudson River near Kingston, NY. Major tributaries of the Wallkill River that pass through Sussex County include Papakating Creek, which begins its run in Frankford Township, and Clove Brook, the upper reaches of which flow south from northern Wantage Township. Pochuck Creek drains parts of Vernon and Hardyston Townships east of Pochuck Mountain before merging with the Wallkill several miles over the NJ-NY border. Several branches of the Black Creek flow through Vernon Township (Sussex County 2015).

Watershed Management Area 03 – Pequannock River

A small area of eastern Sussex County is drained by the Pequannock River, which flows south out of Vernon Township continuing into Hardyston Township where it turns southeast, forming the border between Morris and Passaic Counties, before ultimately converging with the Passaic River in Essex County. Tributaries of the Pequannock in Sussex County include a stretch of the upper Pacack Brook and an unnamed tributary located in Hardyston Township (Sussex County 2015).

Watershed Management Area 6 – Rockaway River

The Rockaway River itself does not pass through Sussex County, but the system's upper reaches includes many tributaries in eastern Sparta Township, where several streams merge to form Russia Brook. Russia Brook flows into Jefferson Township (Morris County) where it meets the Rockaway River (Sussex County 2015).

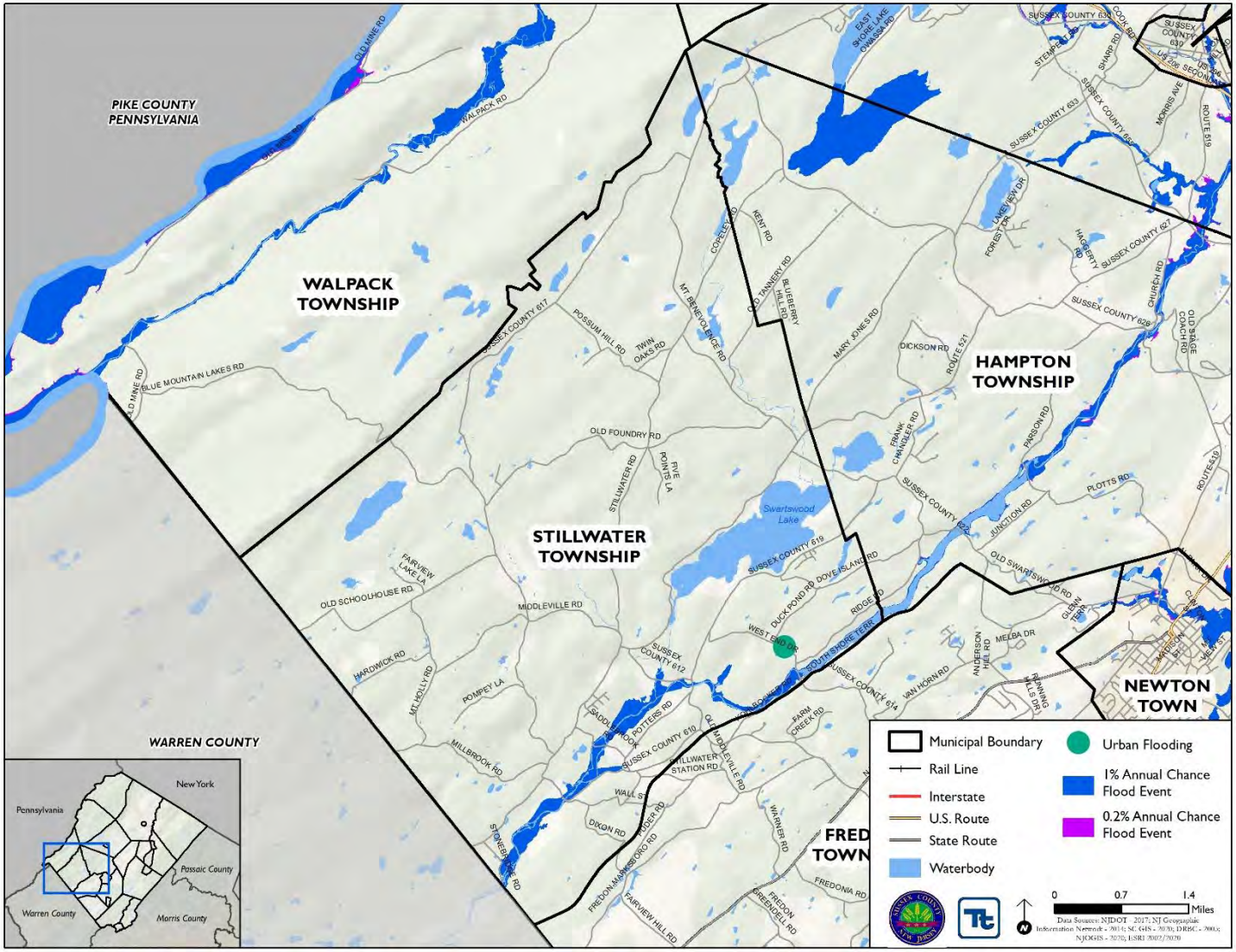
Ice Jams

Ice jams can occur along rivers and creeks. In Sussex County, ice jams have historically occurred along the Delaware River (USACE CRREL 2020).

Urban Flooding

Throughout Sussex County, low-lying surface flooding and interior shallow ponding occurs as a result of heavy rainfall and inadequate capacity of stormwater systems. While riverine flooding is mapped by FEMA, urban flooding is not. Stillwater Township identified one urban flooding location where a low-lying area floods. Figure 4.3.5-3 illustrates this urban flood location.

Figure 4.3.5-3. Urban Flood Areas Identified in Sussex County



Natural and Beneficial Floodplain Areas

Although typically associated as a hazard area, floodplains also serve beneficial and natural functions (on ecological/environmental, social, and economic levels). Disruption of these natural systems can have long-term consequences on entire regions; however, this potential impact has only recently been noted. Some of the more well-known water-related functions for floodplains include:

- Natural flood and erosion control
  - Provide flood storage and conveyance
  - Reduce flood velocities
  - Reduce flood peaks
  - Reduce sedimentation
- Surface water quality maintenance
  - Filter nutrients and impurities from runoff
  - Process organic wastes
  - Moderate temperatures of water
- Groundwater recharge
  - Promote infiltration and aquifer recharge
  - Reduce frequency and duration of low surface flows (FEMA)

Areas in the floodplain that typically provide these natural functions are wetlands, riparian areas, sensitive areas, and habitats for rare and endangered species. According to NJ DEP 2015 Land-Use Land-Cover data, the County has several floodplain areas that could serve natural and beneficial functions (Landscape Project contains the endangered species data). This information is summarized in Tables 4.3.5-1 and 4.3.5-2.

Table 4.3.5-1. Acreage of Wetlands by Jurisdiction

Jurisdiction	Total Area (Acres)	Wetlands	
		Area (Acres)	Percent of Total Area
Andover (B)	872	76	8.7%
Andover (Twp)	13,304	1,847	13.9%
Branchville (B)	383	5	1.3%
Byram (Twp)	14,536	1,218	8.4%
Frankford (Twp)	22,585	3,222	14.3%
Franklin (B)	2,833	370	13.1%
Fredon (Twp)	11,464	1,314	11.5%
Green (Twp)	10,429	1,175	11.3%
Hamburg (B)	747	80	10.8%
Hampton (Twp)	16,305	2,738	16.8%
Hardyston (Twp)	20,892	3,475	16.6%
Hopatcong (B)	7,949	569	7.2%
Lafayette (Twp)	11,499	2,172	18.9%
Montague (Twp)	29,840	3,730	12.5%
Newton (T)	2,164	337	15.6%

Jurisdiction	Total Area (Acres)	Wetlands	
		Area (Acres)	Percent of Total Area
Ogdensburg (B)	1,438	258	17.9%
Sandyston (Twp)	26,926	2,170	8.1%
Sparta (Twp)	24,828	2,987	12.0%
Stanhope (B)	1,341	113	8.4%
Stillwater (Twp)	18,076	2,066	11.4%
Sussex (B)	399	34	8.5%
Vernon (Twp)	44,769	7,846	17.5%
Walpack (Twp)	15,945	744	4.7%
Wantage (Twp)	43,175	8,254	19.1%
Sussex County (Total)	**342,701**	**46,797**	**13.7%**

Source: NJDEP 2015
B – Borough; T – Town; Twp – Township; % - Percent

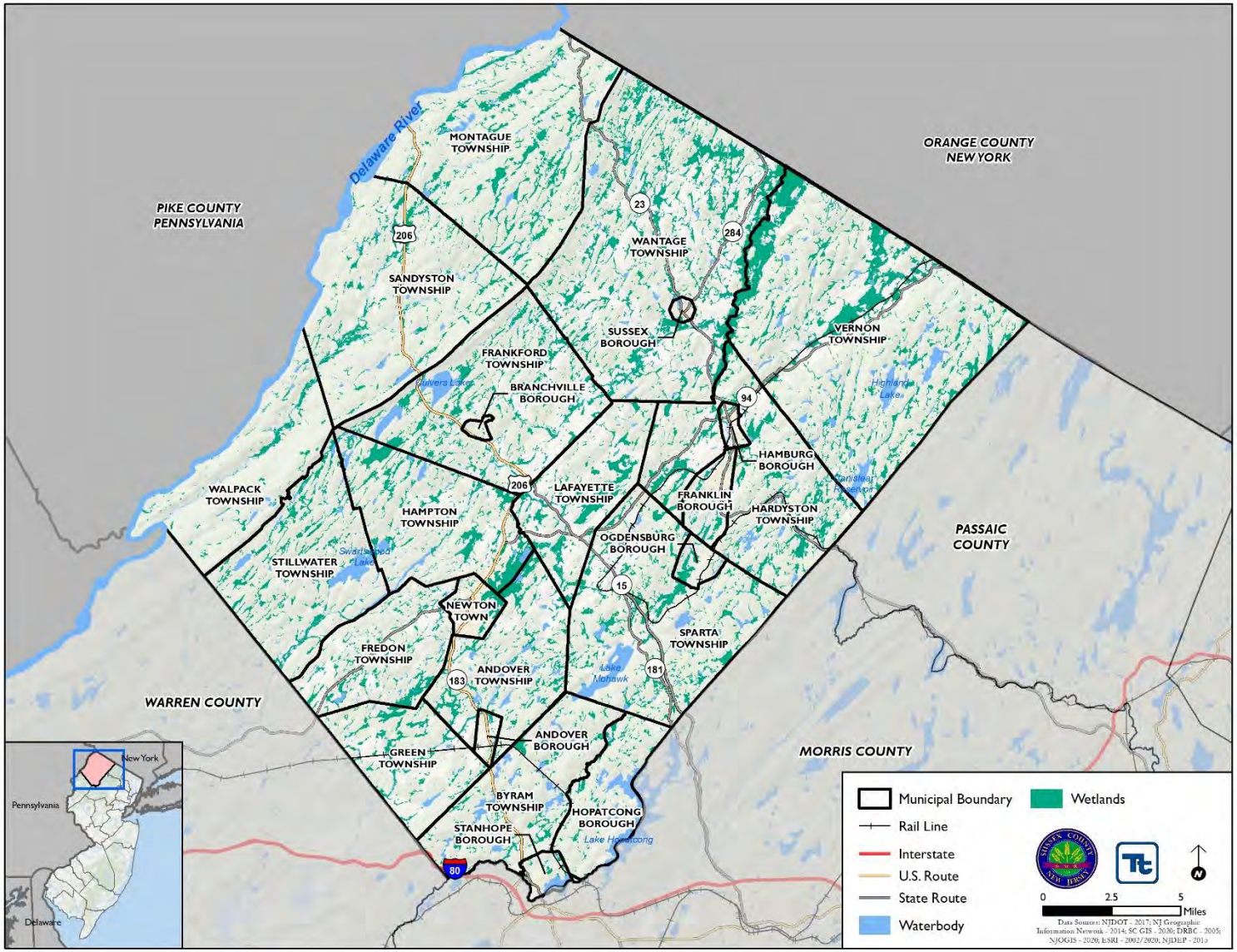
Table 4.3.5-2 Natural and Beneficial Land in Sussex County

Wetlands	Area (acres)	Forest	Area (acres)	Endangered Species	Area (acres)
Agricultural Wetlands (Modified)	4,109	Coniferous Brush/Shrubland	1,402	State Threatened	7,735
Atlantic White Cedar Wetlands	31	Coniferous Forest (>50% Crown Closure)	5,814	State Endangered	100,568
Cemetery on Wetland	1	Coniferous Forest (10-50% Crown Closure)	935	Federally Listed	164,667
Coniferous Scrub/Shrub Wetlands	126	Deciduous Brush/Shrubland	4,772		
Coniferous Wooded Wetlands	858	Deciduous Forest (>50% Crown Closure)	133,379		
Deciduous Scrub/Shrub Wetlands	5,816	Deciduous Forest (10-50% Crown Closure)	7,817		
Deciduous Wooded Wetlands	24,741	Mixed Deciduous/Coniferous Brush/Shrubland	4,801		
Disturbed Wetlands (Modified)	100	Mixed Forest (>50% Coniferous With >50% Crown Closure)	8,545		
Former Agricultural Wetland (Becoming Shrubby, Not Built-Up)	643	Mixed Forest (>50% Coniferous With 10-50% Crown Closure)	1,025		
Freshwater Tidal Marshes	1	Mixed Forest (>50% Deciduous With >50% Crown Closure)	14,151		
Herbaceous Wetlands	7,194	Mixed Forest (>50% Deciduous With 10-50% Crown Closure)	1,503		
Managed Wetland In Built-Up Maintained Rec Area	137	Old Field (< 25% Brush Covered)	6,038		

Wetlands	Area (acres)	Forest	Area (acres)	Endangered Species	Area (acres)
Managed Wetland In Maintained Lawn Greenspace	125	Phragmites Dominate Old Field	13		
Mixed Scrub/Shrub Wetlands (Coniferous Dom.)	226	Plantation	948		
Mixed Scrub/Shrub Wetlands (Deciduous Dom.)	528				
Mixed Wooded Wetlands (Coniferous Dom.)	750				
Mixed Wooded Wetlands (Deciduous Dom.)	771				
Phragmites Dominate Interior Wetlands	400				
Unvegetated Flats	40				
Wetland Rights-Of-Way	203				

Source: NJDEP 2015/2019

Figure 4.3.4-4. Wetlands in Sussex County



Extent

The frequency and severity of riverine flooding are measured using a discharge probability, which is the probability that a certain river discharge (flow) level will be equaled or exceeded in a given year. Flood studies use historical records to determine the probability of occurrence for the different discharge levels.

Floodplains are often referred to as 100-year floodplains. A 100-year floodplain is not a flood that will occur once every 100 years; the designation indicates a flood that has a 1-percent chance of being equaled or exceeded each year. Thus, the 100-year flood could occur more than once in a relatively short period of time. Due to this misleading term, FEMA has properly defined it as the 1-percent annual chance flood, or the SFHA. Similarly, the 500-year floodplain will not occur every 500 years but is an event with a 0.2-percent chance of being equaled or exceeded each year. The "1-percent annual chance flood" is now the standard term used by most federal and state agencies and by the National Flood Insurance Program (NFIP) (FEMA 2003). The 1-percent annual chance floodplain establishes the area that has flood insurance and floodplain management requirements and is also referenced as the regulatory floodplain.

The NJDEP is mandated to delineate and regulate flood hazard areas pursuant to N.J.S.A. 58:16A-50 et seq., the Flood Hazard Area Control Act. This Act authorizes the NJDEP to adopt land use regulations for development within the flood hazard areas, to control stream encroachments and to integrate the flood control activities of the municipal, county, state and federal governments. The State's Flood Hazard Area delineations are defined by the New Jersey Flood Hazard Area Design Flood which is equal to a design flood discharge 25% greater in flow than the 1-percent annual chance flood. In addition, the floodway shall be based on encroachments that produce no more than a 0.2-foot water surface rise above the 1-percent annual chance flood.

The USGS National Water Information System (NWIS) collects surface water data from more than 850,000 stations across the country. The time-series data describes stream levels, streamflow (discharge), reservoir and lake levels, surface water quality, and rainfall. The data is collected by automatic recorders and manual field measurements at the gage locations. Sussex County has numerous active USGS stream gages; in addition, stream gauges are located upstream in neighboring counties.

In the case of riverine flood hazard, once a river reaches flood stage, the flood extent or severity categories used by the NWS include minor flooding, moderate flooding, and major flooding. Each category has a definition based on property damage and public threat:

- Minor Flooding - minimal or no property damage, but possibly some public threat or inconvenience.
- Moderate Flooding - some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary.
- Major Flooding - extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations (NWS 2011).

The severity of a flood depends not only on the amount of water that accumulates in a period of time, but also on the land's ability to manage this water. The size of rivers and streams in an area and infiltration rates are significant factors. When it rains, soil acts as a sponge. When the land is saturated or frozen, infiltration rates decrease and any more water that accumulates must flow as runoff (Harris 2008).

Currently, there is no measurement used to further define the frequency and severity of urban flooding.

Previous Occurrences and Losses

The National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) Storm Events database records and defines flood events as follows:

- Flash Flood is reported in the NOAA-NCEI database for a life-threatening, rapid rise of water into a normally dry area beginning within minutes to multiple hours of the causative event (e.g., intense rainfall, dam failure, ice jam).
- Flood is reported in the NOAA-NCEI database for any high flow, overflow, or inundation by water which causes damage. In general, this would mean the inundation of a normally dry area caused by an increased water level in an established watercourse, or ponding of water, that poses a threat to life or property.

Between 1954 and 2020, Sussex County was included in seven flood-related disaster declarations; refer to Table 4.3.5-3. Flood events that have impacted Sussex County between 2015 and 2020 are identified in Table 4.3.5-4 with associated impacts. Please see Section 9 (Jurisdictional Annexes) for detailed information regarding impacts and losses to each municipality. For events prior to 2015, refer to the Appendix E (Risk Assessment Supplement).

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2020, Sussex County was included in two flood-related agricultural disaster declarations. In 2019, Sussex County was included in declaration S4479 for excessive precipitation and S4455 for the combined effects of excessive rainfall, moisture, and storm-force winds from Hurricane Florence. In 2019, indemnities for moisture/precipitation/rain for all other crops totaled $43,692.

Table 4.3.5-3 Flood-Related Disaster (DR) and Emergency (EM) Declarations 1954-2020

Declaration	Event Date	Declaration Date	Event Description
DR-310	September 4, 1971	September 4, 1971	Flood: Heavy Rains & Flooding
DR-477	July 23, 1975	July 23, 1975	Flood: Heavy Rains, High Winds, Hail & Tornadoes
DR-1337	August 12-21, 2000	August 17, 2000	Severe Storms, Flooding and Mudslides
DR-1563	September 18-October 1, 2004	October 1, 2004	Severe Storms and Flooding
DR 1588	April 1-3, 2005	April 19, 2005	Severe Storm(s): Severe Storms and Flooding
DR-1653	June 23-July 10, 2006	July 7, 2006	Severe Storms and Flooding
DR-1694	April 14-20, 2007	April 26, 2007	Severe Storm(s): Severe Storms and Inland and Coastal Flooding

Source: FEMA 2020

Table 4.3.5-4 Flooding Events in Sussex County, 2015 to 2020

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
July 26, 2015	Flash Flood	N/A	N/A	Montague	A cold front over the Finger Lakes region of New York State helped trigger a cluster of showers and thunderstorms with very heavy rain that moved over northwest New Jersey mainly during the evening of the 26th. The heaviest rain fell over western parts of Warren County and especially in far northwest Sussex County. Doppler Radar storm total estimates exceeded 4 inches in the latter. A cluster of thunderstorms with torrential rain caused poor drainage and small creek flash flooding in the Shimers Brook

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					Basin in Montague Township. Event precipitation totals included 4.74 inches in Montague. A mesonet site within Montague measured 2.57 inches of rain in 70 minutes.
February 24, 2016	Flood	N/A	N/A	Flatbrookville through Wallpack Center	A strong low pressure system moving north through the Great Lakes region, combined with its associated warm front and cold front, copious amounts of moisture, and low level jet, produced strong to severe thunderstorms, heavy rain, flash flooding, and stream flooding in New Jersey late Wednesday afternoon and evening, February 24th, with stream flooding continuing into Thursday, February 25th. Thousands were without power for a period across the state, focused in South Jersey. Route 615 was closed due to flooding between Pompey Ridge Road and Flatbrook Bridge on the morning of 2/25.
October 2, 2018	Flash Flood	N/A	N/A	Newton, Hampton Township	Thunderstorms brought locally heavy rain to northern New Jersey on the evening of October 2. Sections of US Route 206 and NJ Route 94 were closed in Newton and in Hampton Township due to flooding.

Source: FEMA 2020; NOAA-NCEI 2020; NWS 2020; SPC 2020; NJOEM 2019
Note: Not all events that have occurred in Sussex County are included due to the extent of documentation and the fact that not all sources have been identified or researched.
K: Thousand
DR Disaster Declaration (FEMA)
FEMA Federal Emergency Management Agency
Mph miles per hour
N/A Not Applicable

Ice Jam Events

Based on review of the CRREL database, 12 ice-jam events have occurred in or near Sussex County between 1780 and 2020. Events that occurred outside of the County were included because they were close enough to the borders to cause possible flooding impacts in Sussex County. Information regarding losses associated with these reported ice jams was limited. According to this database, there have been no ice jam events since 2015 in Sussex County along the Delaware River (CRREL 2020).

Probability of Future Occurrences

Sussex County is expected to continue experiencing direct and indirect impacts of flooding events in the future. These impacts may induce secondary hazards such as infrastructure deterioration or failure, utility failures, power outages, water quality and supply concerns, and transportation delays, accidents and inconveniences.

According to NOAA and the CRREL database, Sussex County experienced 52 flood events between 1950 and 2020, including 23 floods, 27 flash floods, and two ice jams as summarized in Table 4.3.5-5. The table summarizes data regarding the probability of occurrences of flood events in Sussex County based on the historic record. The information used to calculate the probability of occurrence is based solely on NOAA-NCEI storm events database results (NOAA NCEI 2020).

Table 4.3.5-5 Probability of Future Flood Events

Hazard Type	Number of Occurrences Between 1950 and 2020	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	Percent chance of occurrence in any given year
Flood	23	0.33	3.1	0.32	32.4
Flash Flood	27	0.39	2.6	0.38	38.0
Ice Jams	2	0.03	35.5	0.03	2.8
Total	**52**	**0.74**	**1.4**	**0.73**	**73.2**

Source: NOAA-NCEI 2020; CRREL 2020

In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Partnership, the probability of occurrence for flood events in the County is considered 'frequent' (100 percent annual probability; a hazard event may occur multiple times per year, as presented in Table 4.4-1). The ranking of the flood hazard for individual municipalities is presented in the jurisdictional annexes (Section 9).

Climate Change Impacts

Climate change includes changes in temperature, precipitation, or wind patterns, which occur over several decades or longer. Due to the increase in greenhouse gas concentrations since the end of the 1890s, New Jersey has experienced a 3.5° F (1.9° C) increase in the State's average temperature (Office of the New Jersey State Climatologist 2020), which is faster than the rest of the Northeast region (2° F [1.1° C]) (Melillo et al. 2014) and the world (1.5° F [0.8° C]) (IPCC 2014). This warming trend is expected to continue. By 2050, temperatures in New Jersey are expected to increase by 4.1 to 5.7° F (2.3° C to 3.2° C) (Horton et al. 2015). Thus, New Jersey can expect to experience an average annual temperature that is warmer than any to date (low emissions scenario) and future temperatures could be as much as 10° F (5.6° C) warmer (high emissions scenario) (Runkle et al. 2017). New Jersey can also expect that by the middle of the 21st century, 70% of summers will be hotter than the warmest summer experienced to date (Runkle et al. 2017). The increase in temperatures is expected to be felt more during the winter months (December, January, and February), resulting in less intense cold waves, fewer sub-freezing days, and less snow accumulation. Changes in winter temperatures could result in a change in the frequency of ice jam events.

As temperatures increase, Earth's atmosphere can hold more water vapor which leads to a greater potential for precipitation. Currently, New Jersey receives an average of 46 inches of precipitation each year (Office of the New Jersey State Climatologist 2020). Since the end of the twentieth century, New Jersey has experienced slight increases in the amount of precipitation it receives each year, and over the last 10 years there has been a 7.9% increase. By 2050, annual precipitation in New Jersey could increase by 4% to 11% (Horton et al. 2015). By the end of this century, heavy precipitation events are projected to occur two to five times more often (Walsh et al. 2014) and with more intensity (Huang et al. 2017) than in the last century. New Jersey will experience more intense rain events, less snow, and more rainfalls (Fan et al. 2014, Demaria et al. 2016, Runkle et al. 2017). Also, small decreases in the amount of precipitation may occur in the summer months, resulting in greater potential for more frequent and prolonged droughts (Trenberth 2011). New Jersey could also experience an increase in the number of flood events (Broccoli et al. 2020).

A warmer atmosphere means storms have the potential to be more intense (Guilbert et al. 2015) and occur more often (Coumou and Rahmstorf 2012, Marquardt Collow et al. 2016, Broccoli et al. 2020). In New Jersey, extreme

storms typically include coastal nor'easters, snowstorms, spring and summer thunderstorms, tropical storms, and on rare occasions hurricanes. Most of these events occur in the warmer months between April and October, with nor'easters occurring between September and April. Over the last 50 years, in New Jersey, storms that resulted in extreme rain increased by 71% (Walsh et al. 2014) which is a faster rate than anywhere else in the United States (Huang et al. 2017).

Vulnerability Assessment

To assess Sussex County's risk to the flood hazard, a spatial analysis was conducted using the FEMA Risk Map products dated September 2011. The 1- and 0.2-percent annual chance flood events were examined to determine the assets located in the hazard areas and to estimate potential loss using the FEMA Hazus riverine flood model. These results are summarized below. Refer to Section 4.2 (Methodology and Tools) for additional details on the methodology used to assess flood risk.

Impact on Life, Health and Safety

The impact of flooding on life, health, and safety is dependent upon several factors including the severity of the event and whether or not adequate warning time is provided to residents. Hazard exposure represents the population living in or near floodplain areas that could be impacted should a flood event occur. Additionally, exposure should not be limited to only those who reside in a defined hazard zone, but all individuals who may be affected by the hazard event (e.g., people are at risk while traveling in flooded areas, or their access to emergency services is compromised during an event). The degree of that impact will vary and is not strictly measurable.

To estimate population exposure to the 1-percent- and 0.2-percent annual chance flood events, the DFIRM flood boundaries were used. Based on the spatial analysis, there are an estimated 2,182 residents living in the Special Flood Hazard Area (SFHA, or 1-percent annual chance floodplain), or 1.5% of the County's total population. There are an estimated 2,433 residents living in the 0.2-percent annual chance floodplain, or 1.7% of the County's total population. The Borough of Hopatcong has the greatest number of residents living in the floodplain with approximately 333 residents living in the SFHA. The Township of Byram has the greatest number of residents living in the 0.2-percent annual chance flood area—approximately 374 people. Table 4.3.5-6 summarizes the population exposed to the flood hazard by jurisdiction.

Table 4.3.5-6. Estimated Sussex County Population Exposed to the 1-percent and 0.2-percent Flood Hazard Area

Jurisdiction	Total Population	Population Exposed to the 1-Percent Annual Chance Flood Event Hazard Area		Population Exposed to the 0.2-Percent Annual Chance Flood Event Hazard Area	
		Number of People	Percent Total	Number of People	Percent Total
Andover (B)	594	13	2.1%	13	2.1%
Andover (Twp)	5,996	6	0.1%	6	0.1%
Branchville (B)	896	26	2.9%	34	3.8%
Byram (Twp)	8,010	292	3.6%	374	4.7%
Frankford (Twp)	5,361	281	5.2%	287	5.4%
Franklin (B)	4,807	29	0.6%	29	0.6%
Fredon (Twp)	3,214	0	0.0%	0	0.0%
Green (Twp)	3,495	51	1.5%	51	1.5%

Jurisdiction	Total Population	Population Exposed to the 1-Percent Annual Chance Flood Event Hazard Area		Population Exposed to the 0.2-Percent Annual Chance Flood Event Hazard Area	
		Number of People	Percent Total	Number of People	Percent Total
Hamburg (B)	3,152	2	0.1%	2	0.1%
Hampton (Twp)	4,916	36	0.7%	41	0.8%
Hardyston (Twp)	7,886	2	0.0%	2	0.0%
Hopatcong (B)	14,362	333	2.3%	333	2.3%
Lafayette (Twp)	2,390	50	2.1%	70	2.9%
Montague (Twp)	3,716	123	3.3%	149	4.0%
Newton (T)	7,895	84	1.1%	106	1.3%
Ogdensburg (B)	2,314	8	0.3%	64	2.8%
Sandyston (Twp)	1,925	114	5.9%	127	6.6%
Sparta (Twp)	18,841	281	1.5%	281	1.5%
Stanhope (B)	3,377	14	0.4%	19	0.6%
Stillwater (Twp)	3,936	54	1.4%	56	1.4%
Sussex (B)	1,854	10	0.5%	17	0.9%
Vernon (Twp)	22,369	256	1.1%	256	1.1%
Walpack (Twp)	6	1	18.2%	1	18.2%
Wantage (Twp)	10,986	116	1.1%	119	1.1%
Sussex County (Total)	**142,298**	**2,182**	**1.5%**	**2,433**	**1.7%**

Sources: American Community Survey 2018 5-year estimates; FEMA 2011
Note: B – Borough; T - Town; Twp – Township

Research has shown that some populations, while they may not have more hazard exposure, may experience exacerbated impacts and prolonged recovery if/when impacted. This is due to many factors including their physical and financial ability to react or respond during a hazard. Of the population exposed, the most vulnerable include the economically disadvantaged and the population over the age of 65. There are 7,191 persons below the poverty level and 22,889 persons that are over 65 years old in the County. Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on the net economic impact to their family. The population over the age of 65 is more vulnerable because they are more likely to seek or need medical attention which may not be available due to isolation during a flood event and they may have more difficulty evacuating. Special consideration should be taken when planning for disaster preparation, response, and recovery for these vulnerable groups.

The Hazus riverine model estimates the potential sheltering needs as a result of a 1-percent annual chance flood event. The demographic data in Hazus has not been updated and the estimated sheltering needs are based on 2010 U.S. Census data. Hazus estimates 2,150 households may be displaced and 51 people may seek short-term sheltering. These statistics, by jurisdiction, are presented in Table 4.3.5-7. The estimated displaced population and number of persons seeking short-term sheltering differs from the number of persons exposed to the 1-percent annual chance flood, because the displaced population numbers take into consideration that not all residents will be significantly impacted enough to be displaced or to require short-term sheltering during a flood event.

Table 4.3.5-7. Estimated Population Displaced or Seeking Short-Term Shelter from the 1-percent Annual Chance Flood Event

Jurisdiction	Population (ACS 5-Year 2014 - 2018)	1-Percent Annual Chance Flood Event Hazard Area	
		Displaced Population	Persons Seeking Short-Term Sheltering
Andover (B)	594	31	0
Andover (Twp)	5,996	15	0
Branchville (B)	896	33	0
Byram (Twp)	8,010	225	1
Frankford (Twp)	5,361	176	2
Franklin (B)	4,807	86	0
Fredon (Twp)	3,214	2	0
Green (Twp)	3,495	105	0
Hamburg (B)	3,152	0	0
Hampton (Twp)	4,916	14	0
Hardyston (Twp)	7,886	8	0
Hopatcong (B)	14,362	26	0
Lafayette (Twp)	2,390	82	0
Montague (Twp)	3,716	196	5
Newton (T)	7,895	335	39
Ogdensburg (B)	2,314	24	0
Sandyston (Twp)	1,925	57	0
Sparta (Twp)	18,841	85	0
Stanhope (B)	3,377	7	0
Stillwater (Twp)	3,936	61	0
Sussex (B)	1,854	30	0
Vernon (Twp)	22,369	328	4
Walpack (Twp)	6	5	0
Wantage (Twp)	10,986	219	0
Sussex County (Total)	**142,298**	**2,150**	**51**

Sources: Hazus; FEMA 2011
Note: B – Borough; T - Town; Twp – Township

The total number of injuries and casualties resulting from flooding is generally limited based on advance weather forecasting, blockades, and warnings. Therefore, injuries and deaths generally are not anticipated if proper warning and precautions are in place. Ongoing mitigation efforts should help to avoid the most likely cause of injury, which results from persons trying to cross flooded roadways or channels during a flood.

Cascading impacts may also include exposure to pathogens such as mold. After flood events, excess moisture and standing water contribute to the growth of mold in buildings. Mold may present a health risk to building occupants, especially those with already compromised immune systems such as infants, children, the elderly and

pregnant women. The degree of impact will vary and is not strictly measurable. Mold spores can grow in as short a period as 24-48 hours in wet and damaged areas of buildings that have not been properly cleaned. Very small mold spores can easily be inhaled, creating the potential for allergic reactions, asthma episodes, and other respiratory problems. Buildings should be properly cleaned and dried out to safely prevent mold growth (CDC 2020).

Molds and mildews are not the only public health risk associated with flooding. Floodwaters can be contaminated by pollutants such as sewage, human and animal feces, pesticides, fertilizers, oil, asbestos, and rusting building materials. Common public health risks associated with flood events also include:

- Unsafe food
- Contaminated drinking and washing water and poor sanitation
- Mosquitos and animals
- Carbon monoxide poisoning
- Secondary hazards associated with re-entering/cleaning flooded structures
- Mental stress and fatigue

Current loss estimation models such as Hazus are not equipped to measure public health impacts. The best level of mitigation for these impacts is to be aware that they can occur, educate the public on prevention, and be prepared to deal with these vulnerabilities in responding to flood events.

Impact on General Building Stock

After considering the population exposed and potentially vulnerable to the flood hazard, the built environment was evaluated. Exposure includes those buildings located in the flood hazard zone. Potential damage is the modeled loss that could occur to the exposed inventory, including structural and content replacement cost values. Table 4.3.5-8 summarizes these results county-wide.

There are 1,267 buildings located in the 1-percent annual chance flood hazard area with an estimated $2.2 billion of replacement cost value (i.e., building and content replacement costs). In total, this represents approximately 1.8-percent of the County's total general building stock inventory. In addition, there are 1,400 buildings located in the 0.2-percent annual chance flood boundary with an estimated $2.3 billion of building stock and contents exposed. This represents approximately 1.9-percent of the County's total general building stock inventory.

The Hazus flood model estimated potential damages to the buildings in Sussex County at the structure level using the custom structure inventory developed for this HMP and the depth grid generated using the effective 2011 DFIRM data. The potential damage estimated by Hazus to the general building stock inventory associated with the 1-percent annual chance flood is approximately $137.7 million or 0.2-percent of the total building replacement cost value. The Township of Vernon has the greatest estimated building loss—approximately $21.5 million (i.e. 0.4-percent of the total replacement cost value). Refer to Table 4.3.5-9 for the estimated losses by jurisdiction, which also shows the estimated losses for residential, commercial, and other occupancy structures, respectively.

Table 4.3.5-8 Estimated General Building Stock Located in the FEMA Flood Zones - All Occupancies

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposure - Total (All Occupancies)							
			1-Percent Annual Chance Flood Event Hazard Area				0.2-Percent Annual Chance Flood Event Hazard Area			
			Number of Buildings	Percent Total	Replacement Cost Value (RCV)	Percent Total	Number of Buildings	Percent Total	Replacement Cost Value (RCV)	Percent Total
Andover (B)	328	$628,463,029.95	14	4.3%	$174,979,627	27.8%	14	4.3%	$174,979,627	27.8%
Andover (Twp)	2,584	$3,609,679,724.39	5	0.2%	$36,001,962	1.0%	5	0.2%	$36,001,962	1.0%
Branchville (B)	426	$532,377,368.38	14	3.3%	$14,360,449	2.7%	18	4.2%	$20,126,263	3.8%
Byram (Twp)	3,676	$2,746,550,445.88	136	3.7%	$59,432,969	2.2%	171	4.7%	$70,866,182	2.6%
Frankford (Twp)	3,537	$3,129,888,304.60	179	5.1%	$266,202,978	8.5%	186	5.3%	$284,523,862	9.1%
Franklin (B)	2,061	$1,921,211,856.14	20	1.0%	$35,297,163	1.8%	22	1.1%	$42,004,974	2.2%
Fredon (Twp)	1,615	$1,372,050,934.47	0	0.0%	$0	0.0%	0	0.0%	$0	0.0%
Green (Twp)	1,698	$1,598,635,803.93	29	1.7%	$18,997,556	1.2%	29	1.7%	$18,997,556	1.2%
Hamburg (B)	1,594	$1,588,049,291.35	3	0.2%	$68,017,193	4.3%	4	0.3%	$71,157,825	4.5%
Hampton (Twp)	2,763	$2,196,131,598.39	21	0.8%	$13,488,730	0.6%	23	0.8%	$15,725,292	0.7%
Hardyston (Twp)	4,403	$3,183,033,541.83	1	<0.1%	$302,627	<0.1%	1	<0.1%	$302,627	<0.1%
Hopatcong (B)	8,040	$2,888,571,675.73	188	2.3%	$153,787,091	5.3%	188	2.3%	$153,787,091	5.3%
Lafayette (Twp)	1,462	$1,958,174,065.00	30	2.1%	$37,074,106	1.9%	44	3.0%	$56,651,230	2.9%
Montague (Twp)	2,175	$1,459,611,020.48	68	3.1%	$62,615,830	4.3%	82	3.8%	$69,659,154	4.8%
Newton (T)	2,679	$5,093,275,807.16	53	2.0%	$321,219,681	6.3%	60	2.2%	$330,994,913	6.5%
Ogdensburg (B)	992	$819,879,628.63	4	0.4%	$64,763,950	7.9%	26	2.6%	$68,977,030	8.4%
Sandyston (Twp)	1,528	$1,212,626,664.22	78	5.1%	$95,822,091	7.9%	91	6.0%	$101,399,933	8.4%
Sparta (Twp)	8,132	$9,070,094,285.30	128	1.6%	$149,119,235	1.6%	129	1.6%	$150,249,278	1.7%
Stanhope (B)	1,557	$1,051,183,581.21	9	0.6%	$141,434,869	13.5%	12	0.8%	$144,564,976	13.8%
Stillwater (Twp)	2,493	$1,417,579,397.87	31	1.2%	$8,960,900	0.6%	32	1.3%	$9,108,181	0.6%
Sussex (B)	678	$1,945,578,915.70	20	2.9%	$194,803,769	10.0%	24	3.5%	$200,856,377	10.3%
Vernon (Twp)	12,039	$5,658,971,163.02	153	1.3%	$127,448,710	2.3%	154	1.3%	$136,976,734	2.4%

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposure - Total (All Occupancies)							
			1-Percent Annual Chance Flood Event Hazard Area				0.2-Percent Annual Chance Flood Event Hazard Area			
			Number of Buildings	Percent Total	Replacement Cost Value (RCV)	Percent Total	Number of Buildings	Percent Total	Replacement Cost Value (RCV)	Percent Total
Walpack (Twp)	51	$63,691,550.30	9	17.6%	$25,116,984	39.4%	9	17.6%	$25,116,984	39.4%
Wantage (Twp)	5,510	$4,877,543,884.74	74	1.3%	$81,399,036	1.7%	76	1.4%	$82,105,518	1.7%
Sussex County (Total)	**72,021**	**$60,022,853,538.68**	**1,267**	**1.8%**	**$2,150,647,504**	**3.6%**	**1,400**	**1.9%**	**$2,265,133,569**	**3.8%**

Source: FEMA 2011; Sussex County GIS 2020; RS Means 2020
Note: B – Borough; T – Town; Twp – Township

Table 4.3.5-9 Estimated General Building Stock Potential Loss to the 1-Percent Annual Chance Flood Event

Jurisdiction	Total Replacement Cost Value	All Occupancies 1-Percent Annual Chance Flood Event		Residential Losses Only 1-Percent Annual Chance Flood Event		Commercial Losses Only 1-Percent Annual Chance Flood Event		All Other Occupancies Total Losses 1-Percent Annual Chance Flood Event	
		Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total Residential Value	Estimated Loss (Replacement Cost Value)	Percent of Total Commercial Value	Estimated Loss (Replacement Cost Value)	Percent of Total Other Occupancies Value
Andover (B)	$628,463,030	$18,269,210	2.9%	$256,824	0.2%	$18,012,386	3.9%	$0	0.0%
Andover (Twp)	$3,609,679,724	$4,158,644	0.1%	$10,153	<0.1%	$4,148,492	0.2%	$0	0.0%
Branchville (B)	$532,377,368	$13,442	<0.1%	$13,442	<0.1%	$0	0.0%	$0	0.0%
Byram (Twp)	$2,746,550,446	$5,020,306	0.2%	$641,380	0.1%	$1,067,569	0.1%	$3,311,356	1.1%
Frankford (Twp)	$3,129,888,305	$7,604,867	0.2%	$2,345,629	0.2%	$1,132,760	0.1%	$4,126,478	0.4%
Franklin (B)	$1,921,211,856	$525,746	<0.1%	$449,981	0.1%	$75,765	<0.1%	$0	0.0%
Fredon (Twp)	$1,372,050,934	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Green (Twp)	$1,598,635,804	$3,953,072	0.2%	$424,189	0.1%	$0	0.0%	$3,528,884	0.5%
Hamburg (B)	$1,588,049,291	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%

Jurisdiction	Total Replacement Cost Value	All Occupancies 1-Percent Annual Chance Flood Event		Residential Losses Only 1-Percent Annual Chance Flood Event		Commercial Losses Only 1-Percent Annual Chance Flood Event		All Other Occupancies Total Losses 1-Percent Annual Chance Flood Event	
		Estimated Loss (Replacement Cost Value)	Percent of Total	Estimated Loss (Replacement Cost Value)	Percent of Total Residential Value	Estimated Loss (Replacement Cost Value)	Percent of Total Commercial Value	Estimated Loss (Replacement Cost Value)	Percent of Total Other Occupancies Value
Hampton (Twp)	$2,196,131,598	$202,871	<0.1%	$76,105	<0.1%	$0	0.0%	$126,766	<0.1%
Hardyston (Twp)	$3,183,033,542	$182,343	<0.1%	$182,343	<0.1%	$0	0.0%	$0	0.0%
Hopatcong (B)	$2,888,571,676	$1,074,057	<0.1%	$73,491	<0.1%	$0	0.0%	$1,000,566	0.3%
Lafayette (Twp)	$1,958,174,065	$8,157,067	0.4%	$365,595	0.1%	$768,384	0.2%	$7,023,088	0.7%
Montague (Twp)	$1,459,611,020	$2,007,280	0.1%	$1,822,040	0.3%	$0	0.0%	$185,239	<0.1%
Newton (T)	$5,093,275,807	$3,528,378	0.1%	$211,423	<0.1%	$727,209	<0.1%	$2,589,746	0.3%
Ogdensburg (B)	$819,879,629	$10,265,826	1.3%	$61,283	<0.1%	$10,204,543	3.1%	$0	0.0%
Sandyston (Twp)	$1,212,626,664	$3,885,891	0.3%	$493,390	0.1%	$2,487	<0.1%	$3,390,014	0.6%
Sparta (Twp)	$9,070,094,285	$13,918,398	0.2%	$1,298,468	<0.1%	$12,204,611	0.3%	$415,320	<0.1%
Stanhope (B)	$1,051,183,581	$0	0.0%	$0	0.0%	$0	0.0%	$0	0.0%
Stillwater (Twp)	$1,417,579,398	$56,587	<0.1%	$4,088	<0.1%	$0	0.0%	$52,499	<0.1%
Sussex (B)	$1,945,578,916	$72,932	<0.1%	$0	0.0%	$0	0.0%	$72,932	<0.1%
Vernon (Twp)	$5,658,971,163	$21,538,532	0.4%	$1,944,482	0.1%	$17,592,777	1.8%	$2,001,273	0.2%
Walpack (Twp)	$63,691,550	$15,594,172	24.5%	$59,321	2.1%	$0	0.0%	$15,534,851	34.0%
Wantage (Twp)	$4,877,543,885	$17,621,344	0.4%	$2,555,710	0.1%	$8,860,280	1.0%	$6,205,354	0.3%
Sussex County (Total)	**$60,022,853,539**	**$137,650,964**	**0.2%**	**$13,289,334**	**0.1%**	**$74,797,262**	**0.3%**	**$49,564,367**	**0.4%**

Source: Hazus; FEMA 2011; Sussex County GIS 2020; RS Means 2020
Note: B – Borough; T – Town; Twp – Township

NFIP Statistics

FEMA provided a list of properties with NFIP policies, past claims, and multiple claims. According to FEMA, a repetitive loss (RL) property is a NFIP-insured structure that has had at least two paid flood losses of more than $1,000 in any 10-year period since 1978. A severe repetitive loss (SRL) property is a NFIP-insured structure that has had four or more separate claim payments made under a standard flood insurance policy, with the amount of each claim exceeding $5,000 and with the cumulative amount of such claims payments exceeding $20,000; or at least two separate claims payments made under a standard flood insurance policy with the cumulative amount of such claim payments exceed the fair market value of the insured building on the day before each loss (FEMA 2018).

Table 4.3.5-10, Table 4.3.5-11, and Table 4.3.5-12 summarize the NFIP policies, claims, and repetitive loss statistics for Sussex County. A majority of the repetitive loss properties are single family residential homes (87.5-percent). There are no SRL properties reported for the County. This information is current as of September 2019.

The locations of repetitive flooding were geocoded and mapped. Figure 4.3.5-3 illustrates these properties with the understanding that there are varying tolerances between how closely the longitude and latitude coordinates correspond to the location of the property address.

Table 4.3.5-10. Occupancy Class of Repetitive Loss Structures in Sussex County

Occupancy Class	Total Number of NFIP Repetitive Loss (RL) Properties
Single Family	14
2-4 Family	1
Non-Residential	1
Sussex County (Total)	**16**

Source: FEMA Region 2 2019; JUDEX 2020
Note: Repetitive loss statistics provided by FEMA Region 2 and are current as of September 2019.

Table 4.3.5-11. Occupancy Class of Repetitive Loss Structures in Sussex County, by Jurisdiction

Jurisdiction	NFIP Repetitive Loss Properties		
	Single Family	2-4 Family	Non-Residential
Andover (B)	0	0	0
Andover (Twp)	0	0	0
Branchville (B)	1	1	0
Byram (Twp)	3	0	0
Frankford (Twp)	1	0	0
Franklin (B)	0	0	0
Fredon (Twp)	0	0	0
Green (Twp)	0	0	0
Hamburg (B)	0	0	0
Hampton (Twp)	0	0	0
Hardyston (Twp)	0	0	0
Hopatcong (B)	1	0	0
Lafayette (Twp)	1	0	0
Montague (Twp)	2	0	0
Newton (T)	0	0	0

Jurisdiction	NFIP Repetitive Loss Properties		
	Single Family	2-4 Family	Non-Residential
Ogdensburg (B)	2	0	0
Sandyston (Twp)	1	0	0
Sparta (Twp)	0	0	0
Stanhope (B)	0	0	0
Stillwater (Twp)	0	0	0
Sussex (B)	0	0	1
Vernon (Twp)	2	0	0
Walpack (Twp)	0	0	0
Wantage (Twp)	0	0	0
Sussex County (Total)	14	1	1

Source: FEMA Region 2 2019; JUDEX 2020
B – Borough; T – Town; Twp – Township NFIP = National Flood Insurance Program
Notes: Repetitive loss statistics provided by FEMA Region 2 and are current as of September 2019. The statistics were summarized using the Community Name provided by FEMA Region 2.

Table 4.3.5-12. Repetitive Loss Properties and NFIP Data for Sussex County

Jurisdiction	Number of NFIP Policies	Number of Write Your Own Policies	Total Number of Policies	Number of NFIP Claims	Number of Write Your Own Claims	Total Claims	Total NFIP Payments	Total Write Your Own Payments	Total Payments	Number of NFIP Repetitive Loss (RL) Properties	Number of NFIP Severe Repetitive Loss (SRL)
Andover (B)	1	2	3	0	1	1	$0	$4,314	$4,314	0	0
Andover (Twp)	2	2	4	0	2	2	$0	$304	$304	0	0
Branchville (B)	1	3	4	3	6	9	$24,016	$33,573	$57,589	2	0
Byram (Twp)	5	17	22	2	12	14	$6,831	$123,046	$129,878	3	0
Frankford (Twp)	0	20	20	1	10	11	$0	$61,459	$61,459	0	0
Franklin (B)	2	9	11	3	8	11	$14,871	$61,017	$75,888	1	0
Fredon (Twp)	1	2	3	0	2	2	$0	$6,937	$6,937	0	0
Green (Twp)	1	8	9	0	2	2	$0	$11,652	$11,652	0	0
Hamburg (B)	0	4	4	0	0	0	$0	$0	$0	0	0
Hampton (Twp)	0	7	7	0	1	1	$0	$0	$0	0	0
Hardyston (Twp)	0	8	8	0	2	2	$0	$60,787	$60,787	0	0
Hopatcong (B)	1	10	11	4	8	12	$1,151	$53,042	$54,193	1	0
Lafayette (Twp)	0	3	3	0	7	7	$0	$24,566	$24,566	1	0
Montague (Twp)	6	13	19	7	10	17	$7,470	$170,778	$178,248	2	0
Newton (T)	2	22	24	0	8	8	$0	$295,505	$295,505	0	0
Ogdensburg (B)	1	10	11	4	5	9	$4,185	$44,937	$49,122	2	0
Sandyston (Twp)	1	7	8	0	5	5	$0	$209,806	$209,806	1	0
Sparta (Twp)	2	44	46	3	11	14	$628	$32,371	$32,999	0	0
Stanhope (B)	0	3	3	1	1	2	$6,052	$10,205	$16,257	0	0
Stillwater (Twp)	0	7	7	1	4	5	$0	$87,323	$87,323	0	0
Sussex (B)	0	4	4	0	4	4	$0	$65,202	$65,202	1	0
Vernon (Twp)	2	24	26	8	10	18	$36,310	$82,702	$119,012	2	0
Walpack (Twp)	0	0	0	0	1	1	$0	$7,076	$7,076	0	0
Wantage (Twp)	0	14	14	3	7	10	$21,511	$159,452	$180,963	0	0
Sussex County (Total)	**28**	**243**	**271**	**40**	**127**	**167**	**$123,025**	**$1,606,054**	**$1,729,080**	**16**	**0**

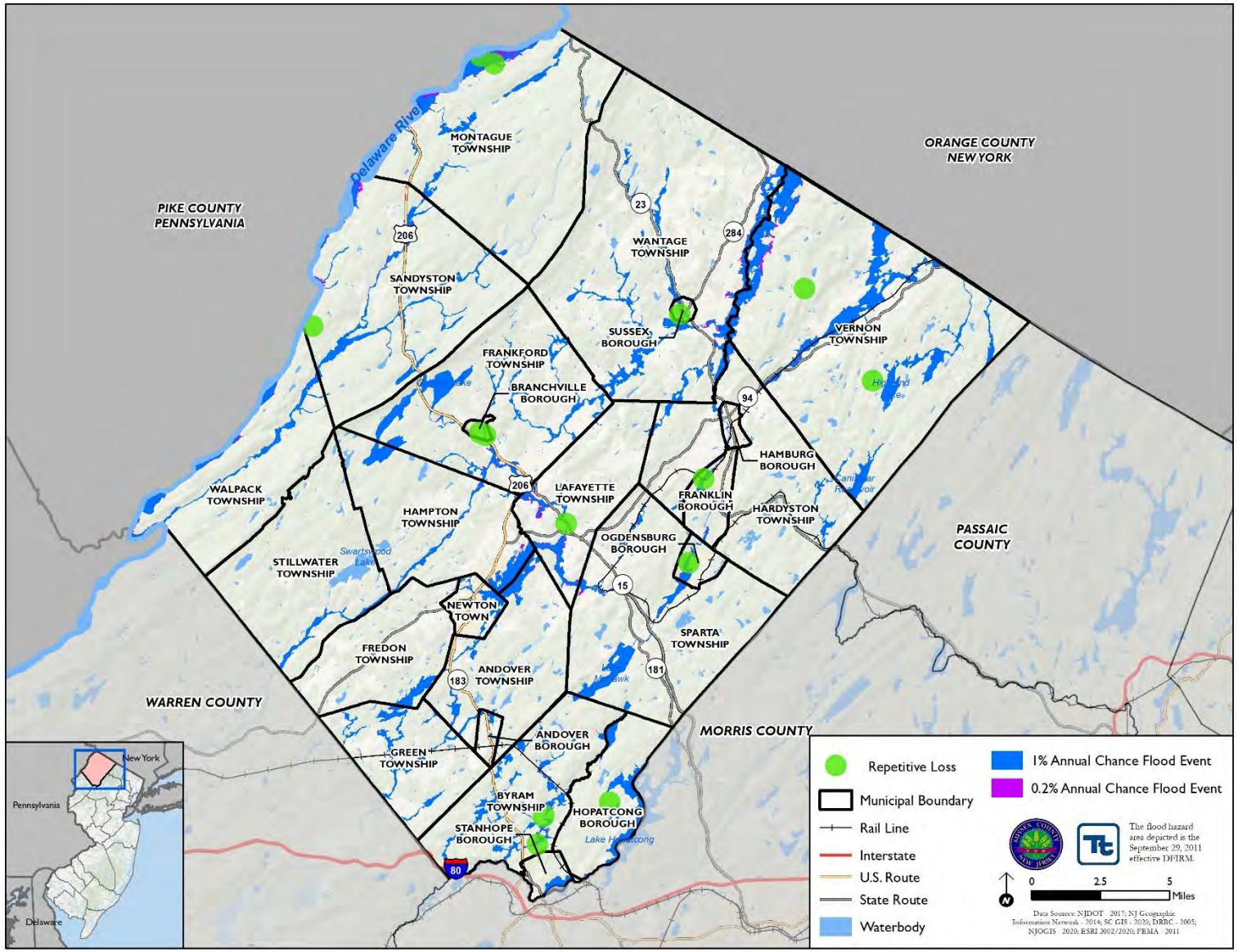
Source: FEMA Region 2 2019; JUDEX 2020

B – Borough; T – Town; Twp – Township NFIP = National Flood Insurance Program

1 - Policies, claims, repetitive loss, and severe repetitive loss statistics provided by FEMA Region 2 and HUDEX and are current as September 2019 and 2020, respectively. The total number of repetitive loss properties includes the severe repetitive loss properties.

2 - Total building and content losses from the claims file provided by HUDEX.

Figure 4.3.5-5. NFIP Repetitive Loss Areas – Sussex County



Impact on Critical Facilities and Lifelines

It is important to determine the critical facilities, infrastructure and community lifelines that may be at risk to flooding, and who may be impacted should damage occur. Critical services during and after a flood event may not be available if critical facilities are directly damaged or transportation routes to access these critical facilities are impacted. Roads that are blocked or damaged can isolate residents and can prevent access throughout the planning area to many service providers needing to reach vulnerable populations or to make repairs.

Critical facility and community lifeline exposure to the flood hazard was examined. Table 4.3.5-13 and Table 4.3.5-14 list critical facilities in the 1- and 0.2-percent annual chance flood event boundaries. Of the 66 critical facilities located in the 1-percent annual chance flood event boundary, the greatest number are dams because they are located in the waterway. Additionally, there are 69 critical facilities located in the 0.2-percent annual chance flood event boundary, 57 of which are dams. A majority of the critical facilities located in the 1-percent and 0.2-percent annual chance flood event boundaries are built in the Township of Byram. Critical facility types that are not listed in the tables were not exposed to the flood hazard.

Table 4.3.5-15 summarizes the critical facilities categorized by the FEMA lifelines that are exposed to the 1-percent and 0.2-percent flood inundation areas. In cases where short-term functionality is impacted by flooding, other facilities of neighboring municipalities may need to increase support response functions during a disaster event. Mitigation planning should consider means to reduce flood impacts to critical facilities and ensure sufficient emergency and school services remain when a significant event occurs.

Approximately 1.5-percent of all roadways are in the 1-percent annual chance flood event. Table 4.3.5-16 summarizes the total number of miles of exposed roadways. Figure 4.3.5-6 displays the major roadways that may be impacted by the 1-percent annual chance flood event. The major highways exposed to the 1-percent annual chance flood extent include portions of: I-80, NJ 181, NJ 23, NJ 15, NJ 94, NJ 183, and US 206.

There are several issues associated with transportation routes flooding, including: isolation caused by bridges being washed out or blocked by floods or debris, health problems caused by water and sewer systems that are flooded or backed up, drinking water contamination caused by floodwaters carrying pollutants in water supplies, and localized urban flooding caused by culverts blocked with debris.

Table 4.3.5-13. Distribution of Critical Facilities within the 1-percent Annual Chance Flood Boundary

Jurisdiction	Facility Types					
	Dam	DPW	Hazardous Material Facility	Potable Water Treatment	Shelter	Wastewater Pump
Andover (B)	0	0	0	1	0	0
Andover (Twp)	0	0	0	0	0	0
Branchville (B)	0	0	0	0	0	0
Byram (Twp)	9	0	0	0	2	2
Frankford (Twp)	4	0	0	0	1	0
Franklin (B)	1	0	0	0	0	0
Fredon (Twp)	0	0	0	0	0	0
Green (Twp)	3	0	0	0	0	0
Hamburg (B)	2	0	0	0	0	0

Jurisdiction		Facility Types				
	Dam	DPW	Hazardous Material Facility	Potable Water Treatment	Shelter	Wastewater Pump
Hampton (Twp)	2	0	0	0	0	0
Hardyston (Twp)	1	0	0	0	0	0
Hopatcong (B)	2	0	0	0	0	0
Lafayette (Twp)	1	0	0	0	0	0
Montague (Twp)	4	0	0	0	0	0
Newton (T)	2	0	0	0	0	0
Ogdensburg (B)	0	0	0	0	0	0
Sandyston (Twp)	8	0	0	0	0	0
Sparta (Twp)	7	0	1	0	0	0
Stanhope (B)	0	0	0	0	0	0
Stillwater (Twp)	3	0	0	0	0	0
Sussex (B)	1	1	0	0	0	0
Vernon (Twp)	4	0	0	0	1	0
Walpack (Twp)	2	0	0	0	0	0
Wantage (Twp)	1	0	0	0	0	0
Sussex County (Total)	**57**	**1**	**1**	**1**	**4**	**2**

Source: FEMA 2011; Sussex County GIS 2020
Note: B – Borough; T – Town; Twp – Township
Only Critical Facility types that are exposed to the flood hazard appear in the table.

Table 4.3.5-14. Distribution of Critical Facilities within the 0.2-percent Annual Chance Flood Boundary

Jurisdiction		Facility Types						
	Dam	DPW	Electrical Substation	Hazardous Material Facility	Post Office	Potable Water Treatment	Shelter	Wastewater Pump
Andover (B)	0	0	0	0	0	1	0	0
Andover (Twp)	0	0	0	0	0	0	0	0
Branchville (B)	0	0	0	0	0	0	0	0
Byram (Twp)	9	0	0	0	0	0	2	2
Frankford (Twp)	4	0	0	0	0	0	1	0
Franklin (B)	1	0	0	0	0	0	0	0
Fredon (Twp)	0	0	0	0	0	0	0	0
Green (Twp)	3	0	0	0	0	0	0	0
Hamburg (B)	2	0	0	0	0	0	0	0

Jurisdiction		Facility Types						
	Dam	DPW	Electrical Substation	Hazardous Material Facility	Post Office	Potable Water Treatment	Shelter	Wastewater Pump
Hampton (Twp)	2	0	0	0	0	0	0	0
Hardyston (Twp)	1	0	0	0	0	0	0	0
Hopatcong (B)	2	0	0	0	0	0	0	0
Lafayette (Twp)	1	1	0	0	0	0	0	0
Montague (Twp)	4	0	0	0	0	0	0	0
Newton (T)	2	0	0	0	0	0	0	0
Ogdensburg (B)	0	0	0	0	0	0	0	0
Sandyston (Twp)	8	0	0	0	1	0	0	0
Sparta (Twp)	7	0	0	1	0	0	0	0
Stanhope (B)	0	0	0	0	0	0	0	0
Stillwater (Twp)	3	0	0	0	0	0	0	0
Sussex (B)	1	1	1	0	0	0	0	0
Vernon (Twp)	4	0	0	0	0	0	1	0
Walpack (Twp)	2	0	0	0	0	0	0	0
Wantage (Twp)	1	0	0	0	0	0	0	0
Sussex County (Total)	**57**	**2**	**1**	**1**	**1**	**1**	**4**	**2**

Source: FEMA 2011; Sussex County GIS 2020
Note: B – Borough; T – Town; Twp – Township
DPW – Department of Public Works
Only Critical Facility types that are exposed to the flood hazard appear in the table.

Table 4.3.5-15. Estimated Number of Community Lifelines Categorized by FEMA Lifeline Categories Exposed to the Flood Hazard Areas

FEMA Lifeline Category	Total Number of Lifelines Identified in Sussex County	Number of Lifelines Exposed to 1-Percent Annual Chance Flood Event Hazard	Number of Lifelines Exposed to 0.2-Percent Annual Chance Flood Event Hazard
Communications	9	0	0
Energy	12	0	1
Food, Water, Shelter	75	6	6
Hazardous Materials	20	0	0
Health and Medical	15	0	0
Safety and Security	463	60	62
Transportation	2	0	0
Sussex County (Total)	**596**	**66**	**69**

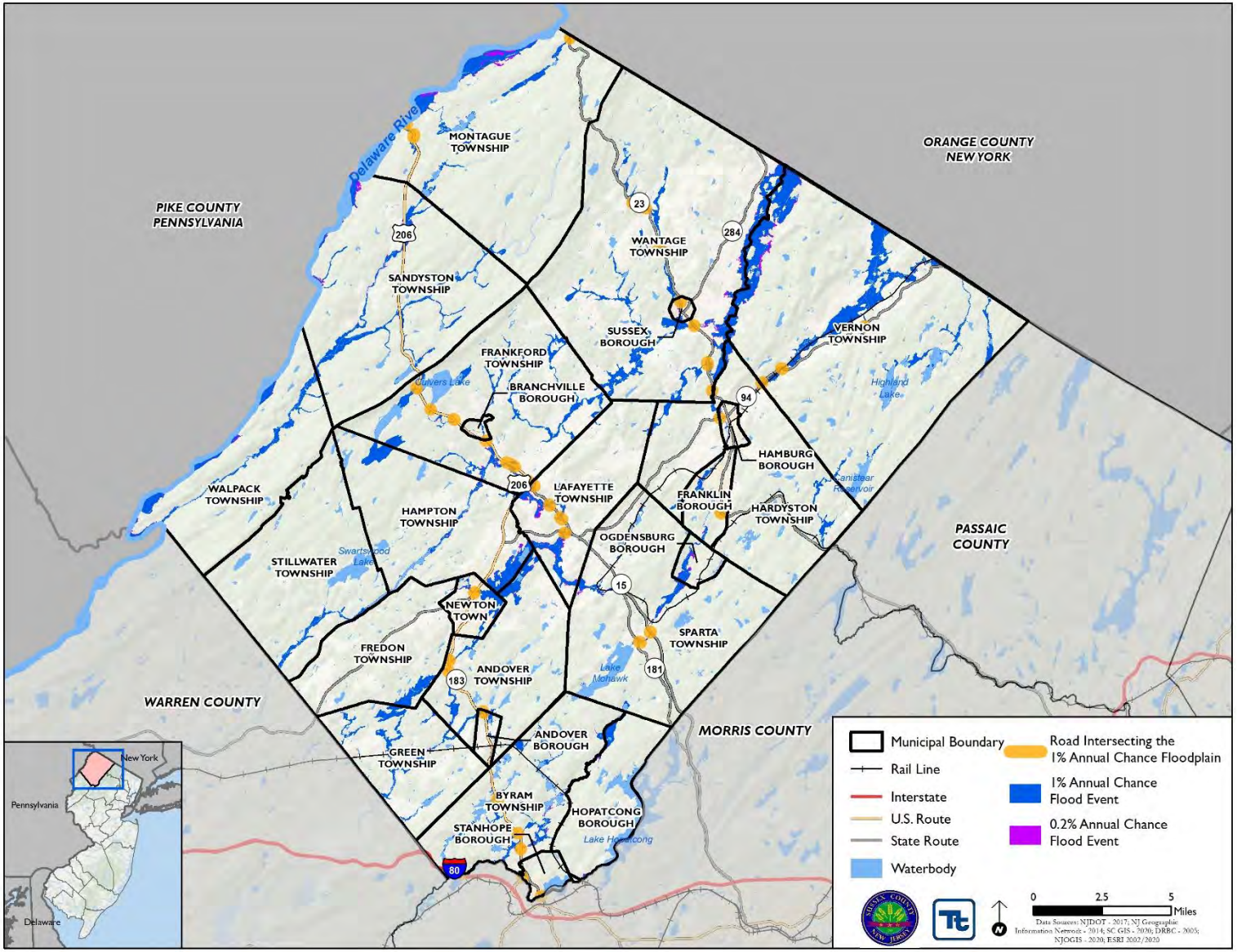
Sources: FEMA 2011/2020; Sussex County GIS 2020

Table 4.3.5-16. Major Transportation Routes Exposed to the Flood Hazard Areas

Road Type	Total Miles in the County	1-Percent Annual Chance Flood Event	
		Miles Located in the Hazard Area	Percent of Total
Local and Private Roads	1,337	19	1.4%
County Roads	313	5	1.6%
State Routes	86	1	1.2%
US Highways	34	1	2.9%
Interstate	1	<0.1	<0.1%
Sussex County (Total)	**1,771**	**26**	**1.5%**

Sources: Sussex County GIS 2020; NJDOT 2019; FEMA 2011

Figure 4.3.5-6. Major Roadways Located in the 1-percent Annual Chance Floodplain



Critical facilities and community lifelines that are near an area where frequent urban flooding occurs are even more vulnerable to flood damages. Urban flooding is defined by FEMA as flooding caused by rain that falls on densely populated areas that have increased amounts of impervious surfaces, which overwhelms the capacity of drainage systems (Natural Resources Defense Council 2019). This type of flooding can be exacerbated by riverine flooding within the County.

Debris from flood events may also affect culverts and sewer systems by creating bottlenecks in the wastewater system, which could not only cause or exacerbate localized urban flooding, but also cause wastewater to spill into homes and neighborhoods or contaminate local rivers and streams. As a result, contamination of drinking water supplies can be a significant secondary event created by major flood events.

Impact on the Economy

Flood events can significantly impact the local and regional economy. This includes but is not limited to general building stock damages and associated tax loss, impacts to utilities and infrastructure, agricultural losses, business interruption, impacts on tourism, and impacts on the tax base to Sussex County. In areas that are directly flooded, renovations of commercial and industrial buildings may be necessary, disrupting associated services. Refer to the 'Impact on Buildings' subsection earlier which discusses direct impacts to buildings in Sussex County. Other economic components such as loss of facility use, functional downtime and socio-economic factors are less measurable with a high degree of certainty.

Flooding can cause extensive damage to public utilities and disruptions to delivery of services. Loss of power and communications may occur and drinking water and wastewater treatment facilities may be temporarily out of operation.

Debris management may also be a large expense after a flood event. Hazus estimates the amount of debris generated from the 1-percent annual chance event. The model breaks down debris into three categories: (1) finishes (dry wall, insulation, etc.); (2) structural (wood, brick, etc.) and (3) foundations (concrete slab and block, rebar, etc.). The distinction is made because of the different types of equipment needed to handle the debris. Table 4.3.5-17 summarizes the debris Hazus estimates for these events. As a result of the 1-percent annual chance event, Hazus estimates approximately 10,855 tons of debris will be generated in total. This table only estimates structural debris generated by flooding and does not include non-structural debris or additional potential damage and debris possibly generated by wind that may be associated with a flood event or storm that causes flooding.

Table 4.3.5-17. Estimated Debris Generated from the 1-percent Annual Chance Flood Event

Jurisdiction	1-Percent Annual Chance Flood Event Hazard Area			
	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)
Andover (B)	145	145	0	0
Andover (Twp)	38	38	0	0
Branchville (B)	65	65	0	0
Byram (Twp)	405	385	11	9
Frankford (Twp)	477	361	67	49
Franklin (B)	264	188	46	30
Fredon (Twp)	2	1	1	1
Green (Twp)	159	115	26	18
Hamburg (B)	0	0	0	0

Jurisdiction	1-Percent Annual Chance Flood Event Hazard Area			
	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)
Hampton (Twp)	27	27	0	0
Hardyston (Twp)	33	16	10	7
Hopatcong (B)	50	49	1	0
Lafayette (Twp)	138	130	4	3
Montague (Twp)	850	386	265	199
Newton (T)	371	336	22	14
Ogdensburg (B)	36	36	0	0
Sandyston (Twp)	259	174	50	35
Sparta (Twp)	3,564	698	1,765	1,101
Stanhope (B)	59	27	18	13
Stillwater (Twp)	152	127	15	10
Sussex (B)	284	209	43	32
Vernon (Twp)	1,411	955	276	180
Walpack (Twp)	1,227	52	675	500
Wantage (Twp)	837	532	179	127
Sussex County (Total)	**10,855**	**5,052**	**3,474**	**2,329**

Source: Hazus; FEMA 2011
Note: B – Borough; T – Town; Twp – Township

Impact on the Environment

As Sussex County communities grow, flood events may increase in frequency and/or severity as land use changes, more structures are built, and impervious surfaces expand. Furthermore, flood extents for the 1-percent and 0.2-percent annual flood events will continue to evolve alongside natural occurrences such as climate change and/or severity of storms. These flood events will impact Sussex County's natural and local environment.

Table 4.3.5-18 lists the number of acres exposed to the 1- and 0.2-percent annual chance flood extents by land use type. Non-residential land use types include forested and open space areas.

Table 4.3.5-18. Land Use Types in Sussex County Exposed to 1% and 0.2% Flood Extents

Land Use Type	Total Acres for County	1-Percent Annual Chance Flood Event		0.2-Percent Annual Chance Flood Event	
		Acres	Percent of Total	Acres	Percent of Total
Residential Land	54,839	811	1.5%	910	1.7%
Non-Residential Land	274,695	19,847	7.2%	20,701	7.5%
Natural Land	237,942	18,441	7.8%	19,138	8.0%
Total County Land	**342,701**	**27,961**	**8.2%**	**28,920**	**8.4%**

Source: NJDEP 2015, FEMA 2011
Notes: Area listed does not include water

Cascading Impacts on Other Hazards

Flood events can exacerbate the impacts of other hazards such as disease outbreak and landslides. After a flooding event, runoff can pick up and transport pollutants from wildlife and soils. Such organisms can then appear in water drinking facilities and transmit illnesses water-borne and vector diseases to the population (WHO, 2020). Flooding can also put additional strain on dams, which may lead to dam failure. More information about these hazards of concern can be found in Section 4.3.1 (Dam Failure) and Section 4.3.2 (Disease Outbreak).

Future Changes That May Impact Vulnerability

Understanding future changes that affect vulnerability can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

As discussed and illustrated in Section 3 (County Profile), areas targeted for future growth and development have been identified across the County. The New Jersey Highlands Council has identified areas of potential growth (Existing Community Zones [where both in-fill of new development and/or re-development may occur], Designated Centers, as well as Sewer Service Areas) that may provide insight as to where potential new development may occur in Sussex County. In addition, each community was requested to provide potential major new development and infrastructure over the next five years; summarized in Section 9 (Jurisdictional Annexes).

An exposure analysis was conducted using the input from the communities as displayed in Figure 4.3.5-7 to determine if new development may be located in the floodplain. Based on the analysis, there is one potential new development located in the 1-percent and 0.2-percent annual chance floodplains, which is located in the Borough of Hamburg. The results of this analysis were shared with all jurisdictions. Being aware of these flood extents and requirements of protection will be critical for all future projects. The Sussex County Planning Board (SCPB) is responsible for review or approval of site plan and subdivision applications, and implementing the Sussex County Land Development Standards. Further, a site plan review process is done at the municipal level to ensure compliance with local ordinances.

Projected Changes in Population

Sussex County has experienced population decline since 2010. According to the U.S. Census Bureau, the County's population has decreased 4.7-percent between 2010 and 2018 (U.S. Census Bureau 2020). The Township of Walpack and the Borough of Sussex have experienced the greatest decline with a decrease of 62.5-percent and 13.0-percent, respectively. The population is expected to continue to decrease as residents move away from the suburbs and towards urban centers (Stirling 2018). Even though the population has decreased over the past decade, any changes in the density of population can impact the number of persons exposed to hurricanes and tropical storms. As the population changes, so will the number of people impacted by this hazard.

Climate Change

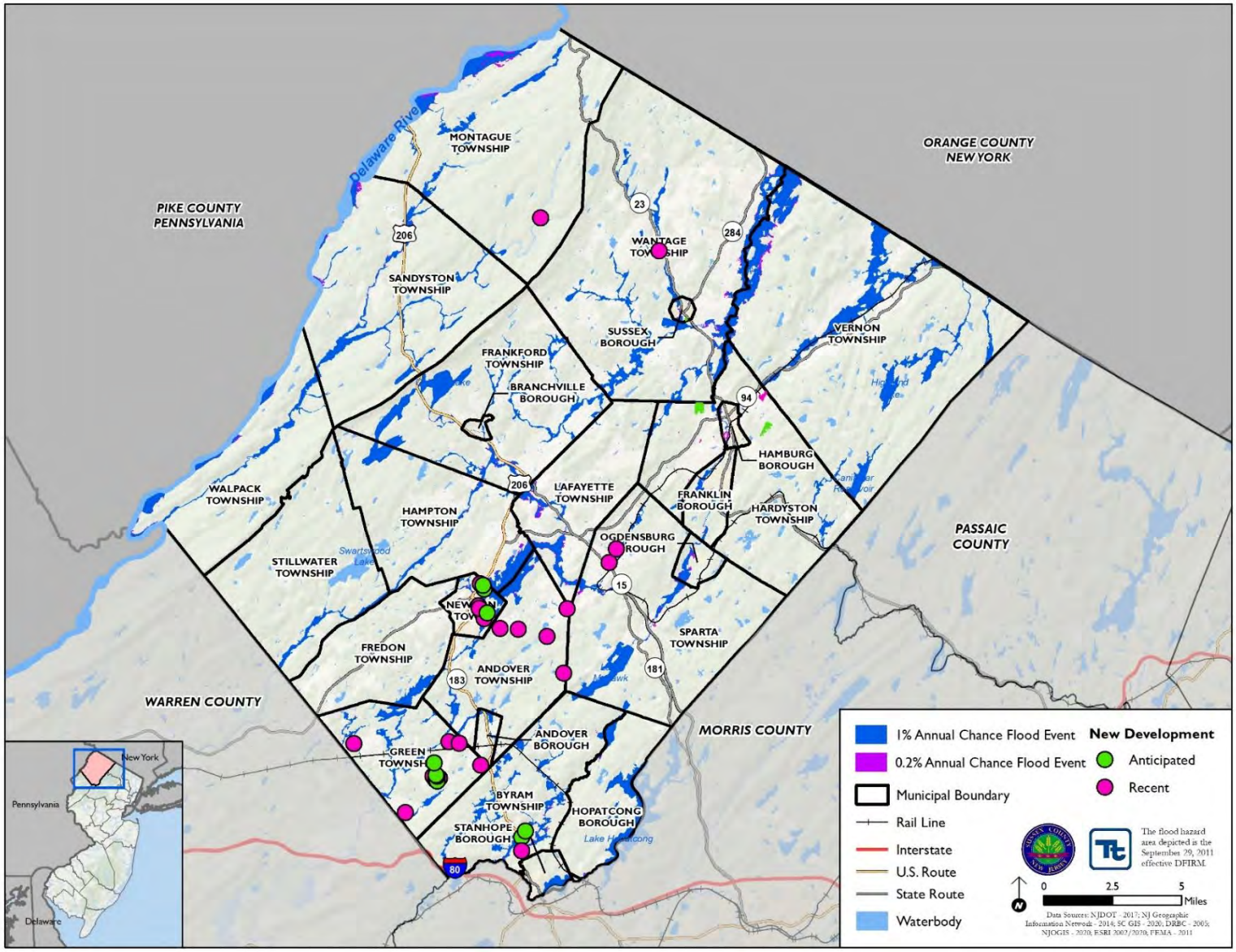
As discussed above, most studies project that the State of New Jersey will see an increase in average annual temperatures and precipitation. Annual precipitation amounts in the region are projected to increase, primarily

in the form of heavy rainfalls, which have the potential to increase the risk to flash flooding and riverine flooding, and flood critical transportation corridors and infrastructure. Increases in precipitation may alter and expand the floodplain boundaries and runoff patterns, resulting in the exposure of populations, buildings, and critical facilities and infrastructure that were previously outside the floodplain. This increase in exposure would result in an increased risk to life and health, an increase in structural losses, a diversion of additional resources to response and recovery efforts, and an increase in business closures affected by future flooding events due to loss of service or access.

Vulnerability Change Since 2016 HMP

The entire County continues to be vulnerable to the flood hazard. Since the 2016 analysis, population statistics have been updated using the 2014-2018 American Community Survey. The general building stock was also updated using RS Means 2020 building valuations that estimated replacement cost value for each building in the inventory. This provides an up-to-date look at the entire building stock for Sussex County and gives more accurate results for the exposure and loss estimation analysis. Additionally, the 2016 critical facility dataset was updated by the County and now includes FEMA community lifelines. A Hazus v4.2 riverine flood analysis of Sussex County was based on the most current and best available data, including building and critical facility inventories, and the FEMA 2011 effective DFIRM that was used in the last HMP to develop the 1-percent annual chance flood event depth grid and boundary as well as the 0.2-percent annual chance flood event boundary.

Figure 4.3.5-7. New Development in the Floodplain



4.3.6 GEOLOGIC

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the geological hazards in Sussex County.

2021 HMP Changes

- All subsections have been updated using best available data.
- Previous occurrences were updated with events that occurred between 2015 and 2020.
- Slopes greater than 15% were utilized to evaluate the potential for landslide; a higher resolution analysis compared to the Radbruch et al. Landslide Incidence and Susceptibility GIS layer from the National Atlas.

Profile

Hazard Description

For the purpose of Sussex County's HMP update, only landslides and land subsidence/sinkholes are discussed for the geological hazard.

Landslides

According to the U.S. Geological Survey (USGS), the term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over steepened slope is the primary reason for a landslide, there are other contributing factors (NJGWS 2013). Among the contributing factors are: (1) erosion by rivers, glaciers, or ocean waves which create over-steepened slopes; (2) rock and soil slopes weakened through saturation by snowmelt or heavy rains; (3) earthquakes which create stresses making weak slopes fail; and (4) excess weight from rain/snow accumulation, rock/ore stockpiling, waste piles, or man-made structures. Scientists from the USGS also monitor stream flow, noting changes in sediment load in rivers and streams that may result from landslides. All of these types of landslides are considered aggregately in USGS landslide mapping.

In New Jersey, there are four main types of landslides: slumps, debris flows, rockfalls, and rockslides. Slumps are coherent masses that move downslope by rotational slip on surfaces that underlie and penetrate the landslide deposit (Briggs et al 2001). A debris flow, also known as a mudslide, is a form of rapid mass movement in which loose soil, rock, organic matter, air, and water mobilize as slurry that flows downslope. Debris flows are often caused by intense surface water from heavy precipitation or rapid snow melt. This precipitation loosens surface matter, thus triggering the slide. Rockfalls are common on roadway cuts and steep cliffs. These landslides are abrupt movements of geological material such as rocks and boulders. Rockfalls happen when these materials become detached. Rockslides are the movement of newly detached segments of bedrock sliding on bedrock, joint, or fault surfaces (Delano and Wilshusen 2001).

Landslides can cause several types of secondary effects, such as blocking access to roads, which can isolate residents and businesses and delay commercial, public, and private transportation. This could result in economic losses for businesses. Other potential problems resulting from landslides are power and communication failures. Vegetation or poles on slopes can be knocked over, resulting in possible losses to power and communication lines. Landslides also have the potential of destabilizing the foundation of structures, which may result in monetary loss for residents. They also can damage rivers or streams, potentially harming water quality, fisheries, and spawning habitat.

Subsidence/Sinkholes

Land subsidence can be defined as the sudden sinking or gradual downward settling of the earth's surface with little or no horizontal motion, owing to the subsurface movement of earth materials (USGS 2000). Subsidence often occurs through the loss of subsurface support in karst terrain, which may result from a number of natural- and human-caused occurrences. Karst describes a distinctive topography that indicates dissolution of underlying carbonate rocks (limestone and dolomite) by surface water or groundwater over time. The dissolution process causes surface depressions and the development of sinkholes, sinking stream, enlarged bedrock fractures, caves, and underground streams (NJOEM 2019).

Sinkholes, the type of subsidence most frequently seen in New Jersey, are a natural and common geologic feature in areas with underlying limestone, carbonate rock, salt beds, or other rocks that are soluble in water. Over periods of time, measured in thousands of years, the carbonate bedrock can be dissolved through acidic rain water moving in fractures or cracks in the bedrock. This creates larger openings in the rock through which water and overlying soil materials will travel. Over time the voids will enlarge until the roof over the void is unable to support the land above at which time it will collapse, forming a sinkhole. In this example the sinkhole occurs naturally, but in other cases the root causes of a sinkhole are anthropogenic. These anthropogenic causes can include changes to the water balance of an area such as: over-withdrawal of groundwater; diverting surface water from a large area and concentrating it in a single point; artificially creating ponds of surface water; and drilling new water wells. These actions can accelerate the natural processes of creation of soil voids, which can have a direct impact on sinkhole creation (NJOEM 2019).

The State's susceptibility to subsidence is also due in part to the number of abandoned mines throughout New Jersey. The mining industry in New Jersey dates back to the early 1600s when cooper was first mined by Dutch settlers along the Delaware River in Warren County. There are approximately 588 abandoned mines in New Jersey. Although mines have closed in New Jersey, continued development in the northern part of the State has been problematic because of the extensive mining there which has caused widespread subsidence. One problem is that the mapped locations of some of the abandoned mines are not accurate. Another issue is that many of the surface openings were improperly filled in, and roads and structures have been built adjacent to or on top of these former mine sites (NJOEM 2019).

Both natural and man-made sinkholes can occur without warning. Slumping or falling fence posts, trees, or foundations, sudden formation of small ponds, wilting vegetation, discolored well water, and/or structural cracks in walls and floors, are all specific signs that a sinkhole is forming. Sinkholes can range in form from steep-walled holes, to bowl, or cone-shaped depressions. When sinkholes occur in developed areas they can cause severe property damage, disruption of utilities, damage to roadways, injury, and loss of life (NJOEM 2019).

Location

Landslides

Landslides are common in New Jersey, primarily in the northern region of the State. Expansion of urban and recreational developments into hillside areas exposes more people to the threat of landslides each year. According to the USGS, Sussex County has low landslide potential. For a figure displaying the landslide potential of the conterminous United States, please refer to http://pubs.usgs.gov/fs/2005/3156/2005-3156.pdf (USGS 2005). Other resources, specifically the National Landslide Hazard Program (NLHP), provide a more detailed level of susceptibility analysis for the State.

The Highland's Steep Stope Protection Area separates steep slopes into four classifications that are not only defined by percent of slope, but also by riparian areas, type of soils, and forestation (NJ Highlands Council 2020). In summary, any slopes above 15-percent fall into one of the four steep slope classifications. For

geological hazards, slopes above 15-percent were selected using the NJDEP contour lines. As displayed in Figure 4.3.6-1, there are slopes greater than 15-percent located throughout the County.

Figure 4.3.6-2 illustrates the historic landslide locations in Sussex County. According to the figure, landslides (particularly debris flows) have occurred throughout Sussex County with a large number occurring in Vernon and Sparta. Many of the landslide incidents documented are the result of Hurricane Irene and storm damage destabilizing roads and causing debris flows. This demonstrates how landslides can be an unexpected secondary hazard during another disaster event. More information on the Hurricane Irene-related landslides can be found later in this profile or in Appendix E (Risk Assessment Supplement).

Subsidence/Sinkholes

New Jersey is susceptible to the effects of subsidence and sinkholes, primarily in the northwestern section of the State, which includes parts of Sussex County. Land subsidence and sinkholes have been known to occur as a result of natural geologic phenomenon or as a result of human alteration of surface and underground geology (NJOEM 2019).

Naturally occurring subsidence and sinkholes in New Jersey occur within bands of carbonate bedrock. In northern New Jersey, there are more than 225 square miles that are underlain by limestone, dolomite, and marble. In some areas, no sinkholes have appeared, while in others, sinkholes are common. Sussex County has bands of carbonate rock running throughout the County; the only areas not containing notable bands of carbonate rock are along the southwestern border and part of the northern section. Overall, approximately 24.9 percent (133.1 square miles) of the County has carbonate rock formation (NJGWS 2005; Godt 2001).

Substantial areas of the New Jersey Highlands are underlain by carbonate rocks, including portions of Sussex County (Figure 4.3.6-3). These rock formations, consisting primarily of limestone, dolomite, and marble, have unique characteristics that require responses to both the policy level and in specific technical guidance to municipalities. According to the NJDEP, 59 of the 88 municipalities within the Highlands region contain carbonate rocks, with eight of those municipalities located in Sussex County. As seen in Figure 4.3.6-4, the Highlands Region has several large areas of carbonate rock formations and karst features exist in some, but not all, of these areas (Highlands Regional Master Plan 2008).

As previously stated, abandoned mines are a source for sinkholes and subsidence in New Jersey. Mines create voids under the earth's surface, making areas above mines more susceptible to land subsidence. Sinkholes and subsidence occur from the collapse of the mine roof into a mine opening. Areas most vulnerable to sinkholes are those where mining occurred 20 to 30 feet below the surface. Figure 4.3.6-5 shows the location of the mapped abandoned mines in Sussex County. The data from NJGWS and the figure indicate that Sussex County has 75 abandoned mines, mainly iron mines with a few lead, zinc, and uranium mines. These mines are principally located in the eastern and southern portions of the County (NJGWS 2006).

Figure 4.3.6-1. Landslide Susceptibility in Sussex County

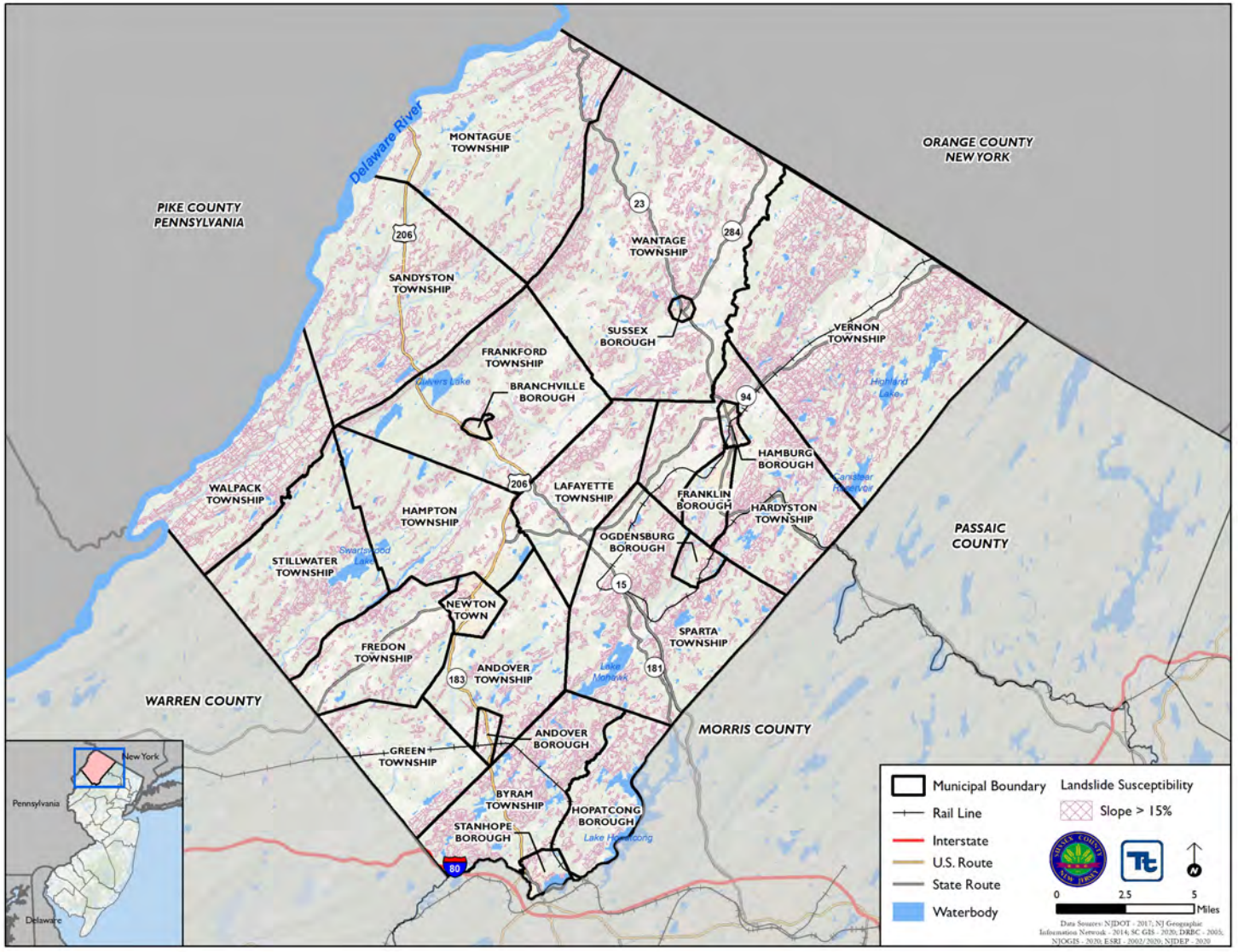


Figure 4.3.6-2. Historic Landslide Locations in Sussex County, 1869 to 2020

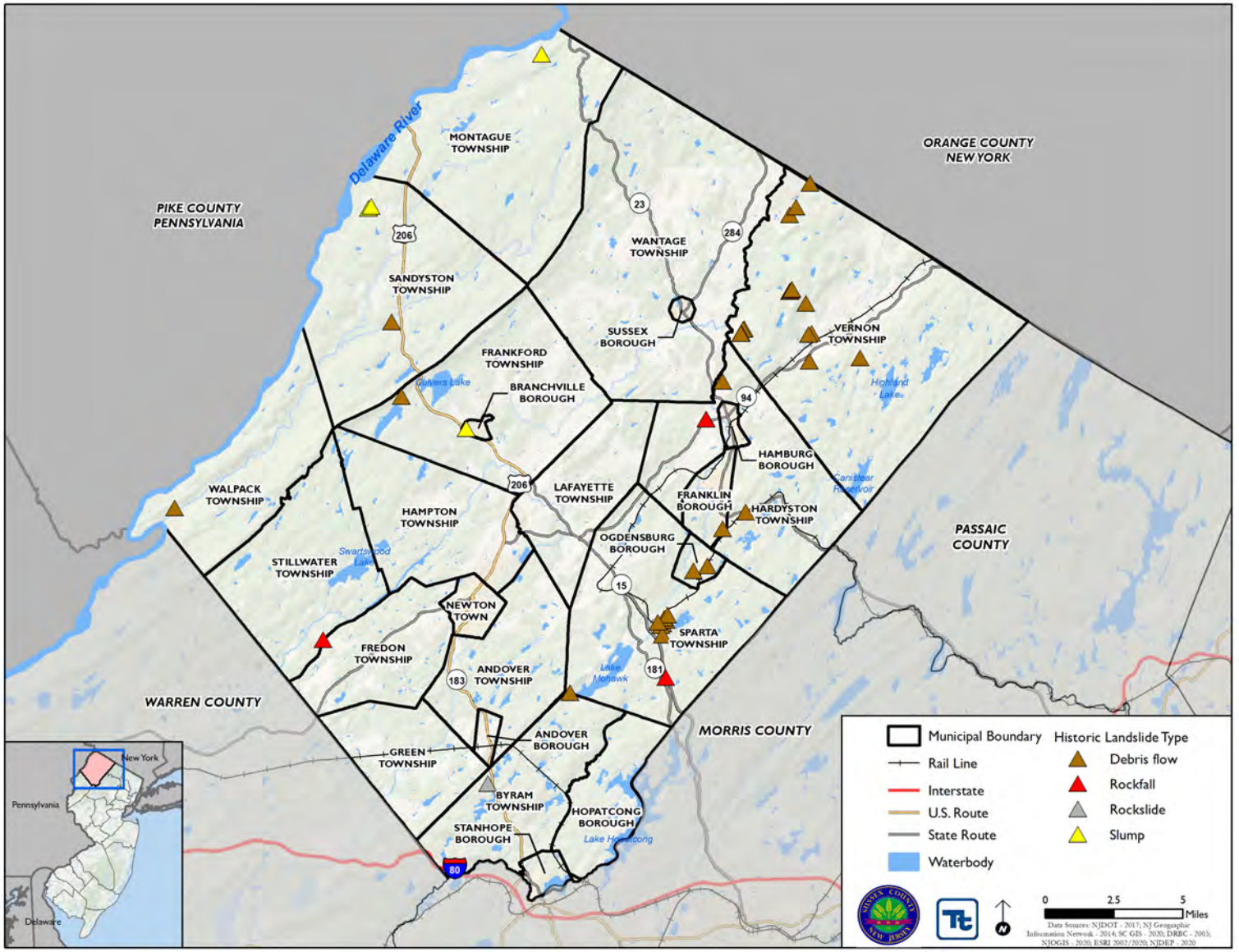
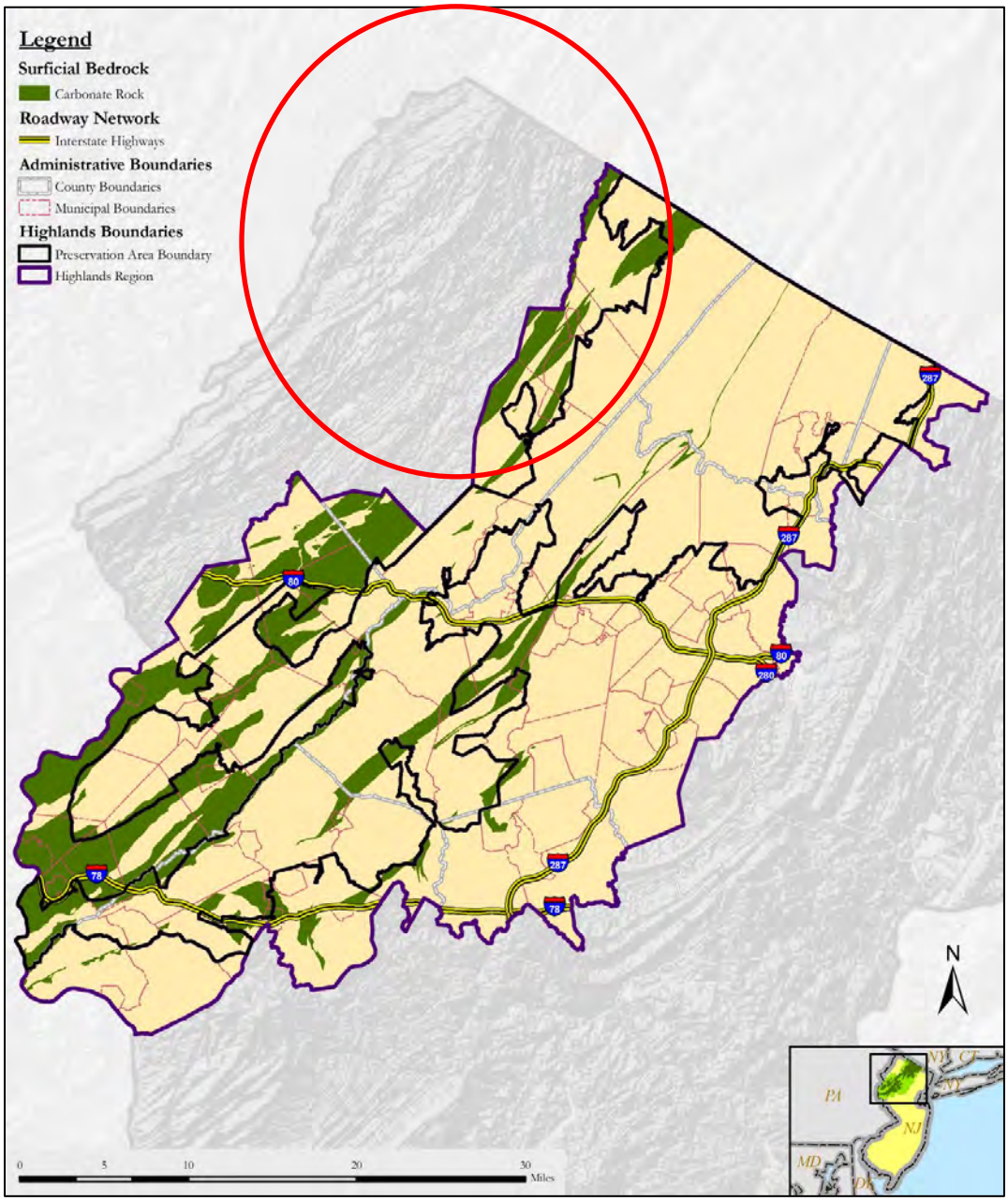


Figure 4.3.6-3. Carbonate Rock in the New Jersey Highlands



Source: New Jersey Highlands Council 2008
Note: The red circle indicates the approximate location of Sussex County.

Figure 4.3.6-5. Carbonate Rock in Sussex County

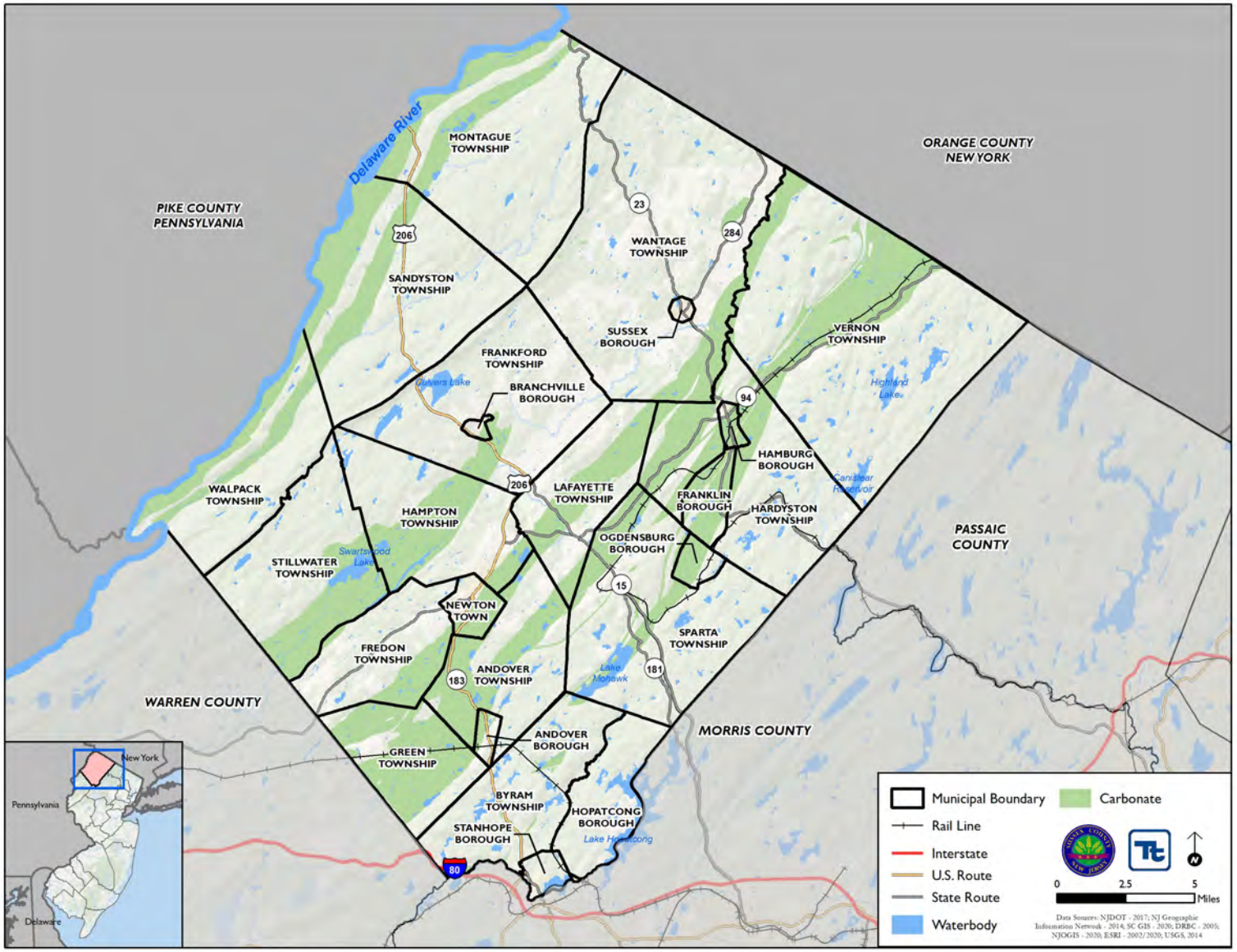
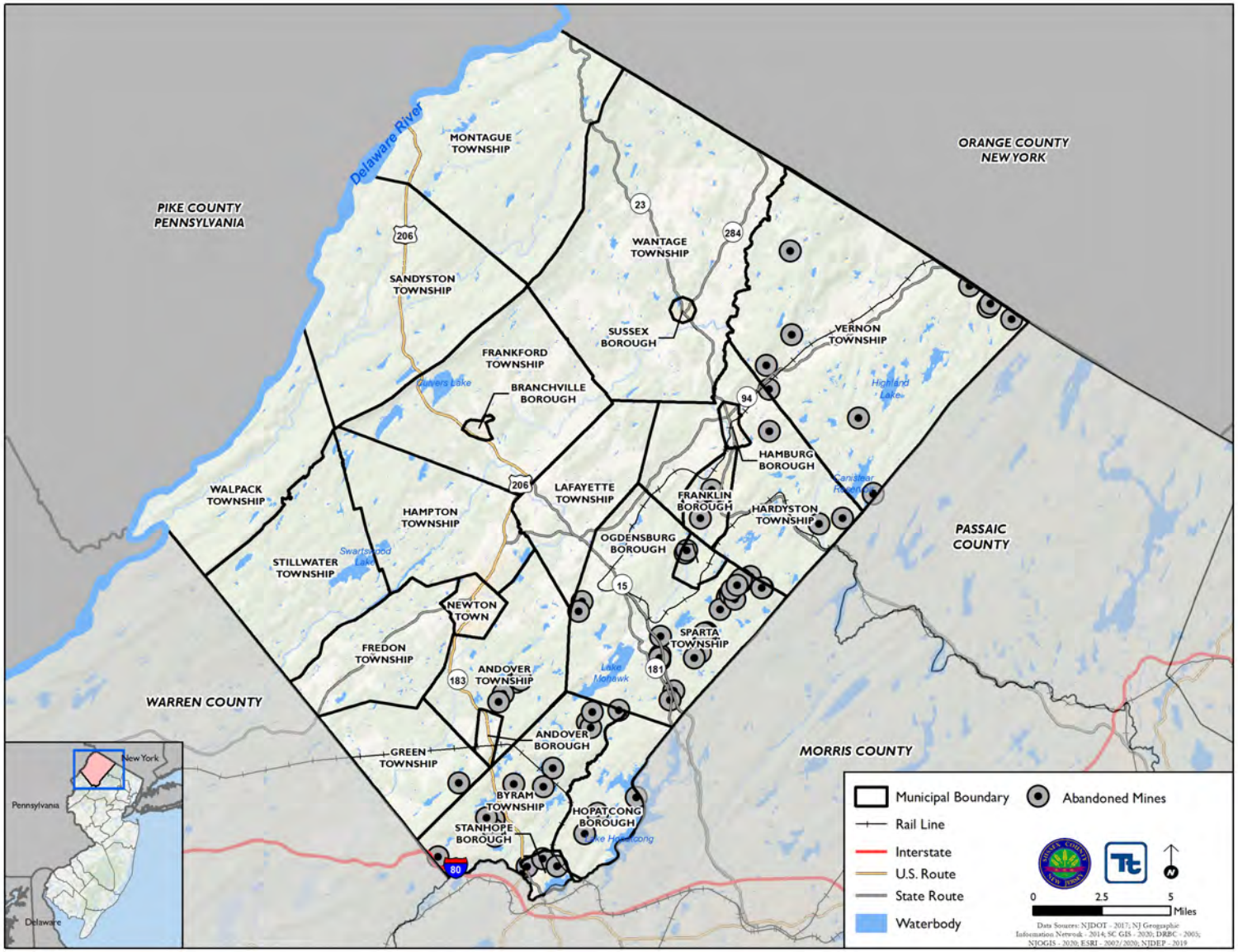


Figure 4.3.6-5. Abandoned Mines in Sussex County



Extent

Landslide

To determine the extent of a landslide hazard, the affected areas need to be identified and the probability of the landslide occurring within some time period needs to be assessed. Natural variables that contribute to the overall extent of potential landslide activity in any particular area include soil properties, topographic position and slope, and historical incidence. Predicting a landslide is difficult, even under ideal conditions and with reliable information. As a result, the landslide hazard is often represented by landslide incidence and/or susceptibility, as defined below:

- Landslide incidence is the number of landslides that have occurred in a given geographic area. High incidence means greater than 15-percent of a given area has been involved in landsliding; medium incidence means that 1.5- to 15-percent of an area has been involved; and low incidence means that less than 1.5-percent of an area has been involved.
- Landslide susceptibility is defined as the probable degree of response of geologic formations to natural or artificial cutting, to loading of slopes, or to unusually high precipitation. It can be assumed that unusually high precipitation or changes in existing conditions can initiate landslide movement in areas where rocks and soils have experienced numerous landslides in the past. Landslide susceptibility depends on slope angle and the geologic material underlying the slope. Landslide susceptibility only identifies areas potentially affected and does not imply a time frame when a landslide might occur. High, medium, and low susceptibility are delimited by the same percentages used for classifying the incidence of landsliding (NJOEM 2019).

Subsidence/Sinkhole

Landslide subsidence occurs slowly and continuously over time or abruptly for various reasons. Subsidence and sinkholes can occur due to either natural processes (karst sinkholes in areas underlain by soluble bedrock) or as a result of human activities. Subsidence in the U.S. has directly affected more than 17,000 square miles in 45 states, and associated annual costs are estimated to be approximately $125 million. The principal causes of subsidence are aquifer-system compaction, drainage of organic soils, underground mining, hydrocompaction, natural compaction, sinkholes, and thawing permafrost (USGS 2000). There are several methods used to measure land subsidence. Global Positioning System (GPS) is a method used to monitor subsidence on a regional scale. Benchmarks (geodetic stations) are commonly space around four miles apart (State of California 2015).

Another method which is becoming increasingly popular is Interferometric Synthetic Aperture Radar (InSAR). InSAR is a remote sensing technique that uses radar signals to interpolate land surface elevation changes. It is a cost-effective solution for measuring land surface deformation for a region while offering a high degree of spatial detail and resolution (State of California 2015).

Previous Occurrences and Losses

FEMA Major Disasters and Emergency Declarations

Between 1954 and 2015, FEMA issued a disaster (DR) or emergency (EM) declaration for the State of New Jersey for one geological hazard-related event, classified as severe storms, flooding and mudslide. This declaration included Sussex County (FEMA 2020). In addition, Sussex County is included in the FEMA disaster declaration for the remnants of Tropical Storm Lee in 2011. Although this disaster is due to severe storms and flooding, it resulted in secondary geological hazard impacts such as flood-induced landslides in certain locations

in the State. Sussex County experienced a debris flow along the lower end of Holland Circle a result of this incident; however, other minor events may have also occurred.

Table 4.3.6-1. FEMA DR and EM Declarations Since 2008 for Geologic Events in Sussex County

Declaration	Event Date	Declaration Date	Event Description
DR-1337	August 12, 2000 - August 21, 2000	August 17, 2000	New Jersey Severe Storms, Flooding And Mudslides
DR-4039	September 8, 2011 - October 6, 2011	October 14, 2011	New Jersey Remnants of Tropical Storm Lee

Source: FEMA 2020

U.S. Department of Agriculture Disaster Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2020, Sussex County was not included in geologic related agricultural disaster declarations.

No additional geologic hazard events were identified during the research to update this section of the HMP. Please see Section 9 (Jurisdictional Annexes) for detailed information regarding impacts and losses to each municipality.

Probability of Future Occurrences

It is likely that geological hazards will occur in Sussex County in the future. Landslide probabilities are largely a function of surface geology, but are also influenced by both weather and human activities. Because of the large number of landslides precipitated by Hurricane Irene in August 2011, landslide probability for Sussex County can be calculated in two ways. If each individual landslide during Hurricane Irene is considered a unique event, then based on NJGWS historic data, Sussex County has a roughly 50-percent chance of a landslide or other geologic event occurring in any given year. In contrast, if all of the Hurricane Irene-related landslides are treated as a single event due to having the same cause, then Sussex County has a roughly 25-percent chance of a landslide or other geologic event occurring in any given year. Specific analyses on the probability of future geologic hazard calculations can be seen in the following two tables, where the first table treats the landslides during Hurricane Irene each as unique events and the second table treats these landslides as one combined event.

There are presumably other smaller landslides and sinkholes that have occurred in the County that have not been reported to the NJGWS and are not included in these calculations. Sussex County will continue to experience the direct and indirect impacts of geological hazards and its impacts on occasion, with the secondary effects causing potential disruption or damage to communities. The table below shows the probability of future geologic events impacting the County, as based on data from the previous occurrences table in Appendix E (Risk Assessment Supplement).

Table 4.3.6-2. Probability of Future Occurrence of Geologic Events, Calculation One

Hazard Type	Number of Occurrences Between 1950 and 2020	Rate of Occurrence	Recurrence Interval (in years)	Probability of event Occurring in Any Given Year	Percent Chance of Occurring in Any Given Year
Debris Flows	32	0.46	2.2	0.45	45.1
Rockfalls	2	0.03	35.5	0.03	2.8
Rockslide	1	0.01	71.0	0.01	1.4

Hazard Type	Number of Occurrences Between 1950 and 2020	Rate of Occurrence	Recurrence Interval (in years)	Probability of event Occurring in Any Given Year	Percent Chance of Occurring in Any Given Year
Slump	2	0.03	35.5	0.03	2.8
Sinkhole	1	0.01	71.0	0.01	1.4
Total	**38**	**0.54**	**1.9**	**0.54**	**53.5**

Source: NJDEP 2012; NOAA-NCEI 2020; NJ.Com 2015; NJ State HMP 2019

Note: The calculations in this table are based off each landslide during Hurricane Irene being treated as unique events. The most notable differences in calculations for this table are for the debris flows.

Table 4.3.6-3. Probability of Future Occurrence of Geologic Events, Calculation Two

Hazard Type	Number of Occurrences Between 1950 and 2020	Rate of Occurrence	Recurrence Interval (in years)	Probability of event Occurring in Any Given Year	Percent Chance of Occurring in Any Given Year
Debris Flows	13	0.19	5.5	0.18	18.3
Rockfalls	2	0.03	35.5	0.03	2.8
Rockslide	1	0.01	71.0	0.01	1.4
Slump	2	0.03	35.5	0.03	2.8
Sinkhole	1	0.01	71.0	0.01	1.4
Total	**19**	**0.27**	**3.7**	**0.27**	**26.8**

Source: NJDEP 2012; NOAA-NCEI 2020; NJ.Com 2015; NJ State HMP 2019

Note: The calculations in this table are based off all the landslides during Hurricane Irene being treated as a single event. The most notable differences in calculations for this table are for the debris flows.

In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for the geologic hazard in the county is considered 'occasional' (between 10 and 100 percent annual probability of a hazard event occurring, as presented in Table 4.4-1). The ranking of the geologic hazard for individual municipalities is presented in the jurisdictional annexes.

Climate Change Impacts

Future climate change may impact storm patterns, increasing the probability of more frequent, intense storms with varying duration. Increase in global temperature could affect the snowpack and its ability to hold and store water. Warming temperatures also could increase the occurrence and duration of droughts, which could increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. All of these factors could increase the probability for landslide occurrences.

Landslides

Both northern and southern New Jersey have become wetter over the past century. Northern New Jersey's 1971-2000 precipitation average was over five inches (12%) greater than the average from 1895-1970 (Office of New Jersey State Climatologist). Annual precipitation in New Jersey has been 8-percent above average during the last 10 years; and has experienced an upward trend of 4.1 inches in precipitation in 100-years (NJDEP 2019).

Climate change may impact storm patterns, increasing the probability of more frequent, intense storms with varying duration. Increase in global temperature could affect the snowpack and its ability to hold and store water. Warming temperatures also could increase the occurrence and duration of droughts, which would increase the

probability of wildfire, reducing the vegetation that helps to support steep slopes. All of these factors would increase the probability for landslide occurrences.

Subsidence/Sinkholes

Similar to landslides, climate change will affect subsidence and sinkholes in New Jersey. As discussed throughout this profile, one of the triggers for subsidence and sinkholes is an abundance of moisture which has the potential to permeate the bedrock causing an event. Climatologists expect an increase in annual precipitation amounts. This increase will coincide with an increased risk in subsidence and sinkholes in vulnerable areas.

More recently, sinkholes have been correlated to land use practices, especially from groundwater pumping and from construction and development practices. Sinkholes may also form when the land surface is changed, such as when industrial and runoff-storage ponds are created. The substantial weight of the new material can trigger an underground collapse of supporting material, thus causing a sinkhole. Additionally, the overburden sediments that cover buried cavities in the aquifer systems are delicately balanced by groundwater fluid pressure. Groundwater is helping keep the surface soil in place. Pumping groundwater for urban water supply and for irrigation can produce new sinkholes in sinkhole-prone areas. If pumping results in a lowering of groundwater levels, then underground structural failure, sinkholes may occur as well (USGS 2020).

Vulnerability Assessment

As noted earlier, the Highland's Steep Stope Protection Area separates steep slopes into four classifications that are not only defined by percent of slope, but also by riparian areas, type of soils, and forestation (NJ Highlands Council 2020). Despite these various land attributes, any slopes above 15-percent fell into one of the four steep slope classifications. To evaluate the geological hazard, slopes above 15-percent were selected using the NJDEP contour lines. Additionally, the 2014 USGS carbonate rock layer was used to identify the geologic hazard area. The following text summarizes the potential impact of geological hazards on the County. Refer to Section 4.2 (Methodology and Tools) for additional details on the methodology used to assess geological hazard risk.

Impact on Life, Health, and Safety

Generally, a landslide or subsidence event is an isolated incidence and impacts the populations within the immediate area of the incident. Specifically, the population located downslope of the landslide hazard areas are particularly vulnerable. In addition to causing damages to residential buildings and displacing residents, landslides and subsidence events can block off or damage major roadways and inhibit travel for emergency responders or populations trying to evacuate the area.

Table 4.3.6-4 summarizes the population living on landscapes with carbonate bedrock. Table 4.3.6-5 summarizes the population living on landscapes with slopes greater than or equal to 15-percent. Overall, 40,124 persons and 18,920 persons are living on carbonate bedrock or landscapes with slopes greater than or equal to 15-percent, respectively. The Boroughs of Ogdensburg and Hamburg, and Township of Walpack have the greatest number of residents living on carbonate bedrock. The Townships of Vernon and Walpack have the greatest number of residents living on landscape slopes greater than or equal to 15-percent.

Table 4.3.6-4. Estimated Population Living on Landscape with Carbonate Rock

Jurisdiction	Total Population	Population Exposed to Carbonate Soils Hazard Area	
		Number of People	Percent of Total
Andover (B)	594	185	31.2%
Andover (Twp)	5,996	2,170	36.2%

Jurisdiction	Total Population	Population Exposed to Carbonate Soils Hazard Area	
		Number of People	Percent of Total
Branchville (B)	896	341	38.1%
Byram (Twp)	8,010	469	5.9%
Frankford (Twp)	5,361	218	4.1%
Franklin (B)	4,807	3,605	75.0%
Fredon (Twp)	3,214	257	8.0%
Green (Twp)	3,495	2,564	73.3%
Hamburg (B)	3,152	2,660	84.4%
Hampton (Twp)	4,916	1,861	37.9%
Hardyston (Twp)	7,886	4,602	58.4%
Hopatcong (B)	14,362	0	0.0%
Lafayette (Twp)	2,390	1,405	58.8%
Montague (Twp)	3,716	1,894	51.0%
Newton (T)	7,895	5,279	66.9%
Ogdensburg (B)	2,314	1,721	74.4%
Sandyston (Twp)	1,925	466	24.2%
Sparta (Twp)	18,841	3,066	16.3%
Stanhope (B)	3,377	0	0.0%
Stillwater (Twp)	3,936	2,090	53.1%
Sussex (B)	1,854	0	0.0%
Vernon (Twp)	22,369	4,885	21.8%
Walpack (Twp)	6	5	81.8%
Wantage (Twp)	10,986	382	3.5%
Sussex County (Total)	**142,298**	**40,124**	**28.2%**

Source: American Community Survey 2018 5-Year Estimates; USGS – 2014
Note: B – Borough; T – Town; Twp – Township; % - Percent

Table 4.3.6-5. Estimated Population Living on Landscape with 15-Percent or Greater Slopes

Jurisdiction	Total Population	Population Exposed to Steep Slope (Greater Than 15-Percent) Hazard Area	
		Number of People	Percent of Total
Andover (B)	594	28	4.7%
Andover (Twp)	5,996	526	8.8%
Branchville (B)	896	37	4.1%
Byram (Twp)	8,010	1,398	17.5%
Frankford (Twp)	5,361	331	6.2%
Franklin (B)	4,807	420	8.7%
Fredon (Twp)	3,214	315	9.8%

Jurisdiction	Total Population	Population Exposed to Steep Slope (Greater Than 15-Percent) Hazard Area	
		Number of People	Percent of Total
Green (Twp)	3,495	322	9.2%
Hamburg (B)	3,152	334	10.6%
Hampton (Twp)	4,916	224	4.6%
Hardyston (Twp)	7,886	636	8.1%
Hopatcong (B)	14,362	1,408	9.8%
Lafayette (Twp)	2,390	202	8.5%
Montague (Twp)	3,716	167	4.5%
Newton (T)	7,895	387	4.9%
Ogdensburg (B)	2,314	199	8.6%
Sandyston (Twp)	1,925	385	20.0%
Sparta (Twp)	18,841	3,173	16.8%
Stanhope (B)	3,377	613	18.2%
Stillwater (Twp)	3,936	310	7.9%
Sussex (B)	1,854	131	7.1%
Vernon (Twp)	22,369	5,657	25.3%
Walpack (Twp)	6	2	27.3%
Wantage (Twp)	10,986	1,713	15.6%
Sussex County (Total)	**142,298**	**18,920**	**13.3%**

Source: American Community Survey 2018 5-Year Estimates; USGS 1999
Note: B – Borough; T - Town; Twp – Township; % - Percent

Research has also shown that some populations, while they may not have more hazard exposure, may experience exacerbated impacts and prolonged recovery if/when impacted. For example, persons over the age of 65 and people below the poverty level are most vulnerable to geologic hazards because of the potential limited access to mobilization or medical resources if a landslide or subsidence event occurs. According to the 2018 American Community Survey 5-Year Population Estimate, there are 22,889 persons over 65 years old and 7,191 persons living below the poverty level out of the total 142,298 persons that live in Sussex County. Higher concentrations of persons over 65 years in age reside in the Township of Walpack (i.e., 100-percent of total population) and higher concentrations of persons living below the poverty level reside in the Borough of Sussex (i.e., 16-percent of total population).

Impact on General Building Stock

In general, the built environment is vulnerable to the geologic hazard if built on soils/geology susceptible to landsliding or sink holes such as carbonate bedrock or slopes that are greater than 15-percent. Geologic hazard areas may destabilize the foundation of structures resulting in monetary losses to businesses and residents. There are 20,410 buildings with a replacement cost value of approximately $21 billion built on lands with carbonate bedrock. Furthermore, there are 9,101 buildings with a replacement cost value of approximately $4.3 billion built on lands with slopes greater than 15-percent. The Township of Vernon has the greatest number of buildings built on carbonate bedrock; 2,853 buildings (23.7-percent of its total building stock) with an estimated replacement cost of $2.1 billion. The Township of Vernon also has the greatest number of buildings built on landscapes with slopes greater than 15-percent; 2,925 buildings (24.3-percent of its total building stock) with an

estimated replacement cost of $1.0 billion. Table 4.3.6-6 summarizes the number of buildings built on each geologic hazard area and the total replacement cost of these buildings by municipality.

Table 4.3.6-6. Number and Value of Buildings Built on Lands with Carbonate Bedrock and Steep Slope (>15-percent) by Municipality

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value (RCV)	Carbonate Rock Hazard Area				Landslide - Steep Slope (Greater Than 15-Percent) Hazard Area			
			Number of Buildings	Percent of Total	Replacement Cost Value ($)	Percent of Total	Number of Buildings	Percent of Total	Replacement Cost Value ($)	Percent of Total
Andover (B)	328	628,463,030	113	34.5%	280,691,477	44.7%	14	4.3%	6,700,947	1.1%
Andover (Twp)	2,584	3,609,679,724	977	37.8%	944,612,676	26.2%	194	7.5%	89,880,361	2.5%
Branchville (B)	426	532,377,368	151	35.4%	164,220,678	30.8%	17	4.0%	70,514,303	13.2%
Byram (Twp)	3,676	2,746,550,446	241	6.6%	134,049,838	4.9%	603	16.4%	270,948,636	9.9%
Frankford (Twp)	3,537	3,129,888,305	173	4.9%	277,940,682	8.9%	221	6.2%	291,532,196	9.3%
Franklin (B)	2,061	1,921,211,856	1,574	76.4%	1,548,691,319	80.6%	166	8.1%	75,207,126	3.9%
Fredon (Twp)	1,615	1,372,050,934	128	7.9%	116,945,626	8.5%	151	9.3%	113,552,287	8.3%
Green (Twp)	1,698	1,598,635,804	1,265	74.5%	1,336,468,311	83.6%	146	8.6%	83,464,927	5.2%
Hamburg (B)	1,594	1,588,049,291	1,336	83.8%	1,301,386,122	81.9%	165	10.4%	121,533,854	7.7%
Hampton (Twp)	2,763	2,196,131,598	1,033	37.4%	682,894,556	31.1%	127	4.6%	79,371,471	3.6%
Hardyston (Twp)	4,403	3,183,033,542	2,577	58.5%	2,129,949,178	66.9%	350	7.9%	192,368,391	6.0%
Hopatcong (B)	8,040	2,888,571,676	0	0.0%	0	0.0%	794	9.9%	256,352,950	8.9%
Lafayette (Twp)	1,462	1,958,174,065	793	54.2%	829,384,510	42.4%	130	8.9%	133,486,764	6.8%
Montague (Twp)	2,175	1,459,611,020	1,113	51.2%	757,855,613	51.9%	93	4.3%	36,781,164	2.5%
Newton (T)	2,679	5,093,275,807	1,701	63.5%	1,949,256,805	38.3%	115	4.3%	81,410,916	1.6%
Ogdensburg (B)	992	819,879,629	755	76.1%	724,843,800	88.4%	89	9.0%	50,845,572	6.2%
Sandyston (Twp)	1,528	1,212,626,664	444	29.1%	419,749,258	34.6%	243	15.9%	120,669,734	10.0%
Sparta (Twp)	8,132	9,070,094,285	1,585	19.5%	3,887,789,926	42.9%	1,269	15.6%	583,093,689	6.4%
Stanhope (B)	1,557	1,051,183,581	0	0.0%	0	0.0%	267	17.1%	96,888,673	9.2%
Stillwater (Twp)	2,493	1,417,579,398	1,275	51.1%	751,289,915	53.0%	204	8.2%	110,706,157	7.8%
Sussex (B)	678	1,945,578,916	0	0.0%	0	0.0%	42	6.2%	38,283,996	2.0%

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value (RCV)	Carbonate Rock Hazard Area				Landslide - Steep Slope (Greater Than 15-Percent) Hazard Area			
			Number of Buildings	Percent of Total	Replacement Cost Value ($)	Percent of Total	Number of Buildings	Percent of Total	Replacement Cost Value ($)	Percent of Total
Vernon (Twp)	12,039	5,658,971,163	2,853	23.7%	2,059,570,999	36.4%	2,925	24.3%	1,033,072,351	18.3%
Walpack (Twp)	51	63,691,550	42	82.4%	48,293,650	75.8%	18	35.3%	8,861,768	13.9%
Wantage (Twp)	5,510	4,877,543,885	281	5.1%	685,129,146	14.0%	758	13.8%	400,957,731	8.2%
Sussex County (Total)	**72,021**	**60,022,853,539**	**20,410**	**28.3%**	**21,031,014,086**	**35.0%**	**9,101**	**12.6%**	**4,346,485,965**	**7.2%**

Source: Sussex County GIS 2020; RS Means 2020; USGS 2014; NJDEP 1999
Note: B – Borough; T - Town; Twp – Township; % - Percent

Impact on Critical Facilities and Lifelines

To estimate potential risk to critical facilities, the critical facility and lifeline inventory was overlaid upon the geologic hazard areas. There are 223 critical facilities built on lands with carbonate bedrock and 19 critical facilities built on landscapes with slopes greater than 15-percent. All of these critical facilities are considered lifelines. Refer to Table 4.3.6-7 which summarizes the number of critical facilities and lifelines exposed to the geologic hazard areas by municipality. Additionally, Table 4.3.6-8 and Table 4.5.6-9 summarize the distribution of critical facilities and lifelines exposed to the geologic hazard area by type. Overall, dams are the most common facility type exposed to both geologic hazards areas. Refer to Table 4.3.6-10 and Table 4.3.6-11 for the assets exposed to the geologic hazard areas categorized by the FEMA lifeline categories. Based on the exposure analysis, safety and security community lifelines are most at risk to impacts from the geologic hazards.

Table 4.3.6-7. Number of Critical Facilities and Lifelines Built on Land with Carbonate Bedrock and Steep Slopes (> 15-percent)

Jurisdiction	Total Critical Facilities and Lifelines Located in Jurisdiction	Carbonate Rock Hazard Area		Landslide Hazard Area - Steep Slope (Greater Than 15-Percent)	
		Critical Facilities and Lifelines	Percent of Total Critical Facilities and Lifelines	Critical Facilities and Lifelines	Percent of Total Critical Facilities and Lifelines
Andover (B)	12	3	25.0%	0	0.0%
Andover (Twp)	37	22	59.5%	1	2.7%
Branchville (B)	4	0	0.0%	0	0.0%
Byram (Twp)	37	4	10.8%	0	0.0%
Frankford (Twp)	23	6	26.1%	1	4.3%
Franklin (B)	10	9	90.0%	0	0.0%
Fredon (Twp)	17	0	0.0%	0	0.0%
Green (Twp)	21	20	95.2%	0	0.0%
Hamburg (B)	19	18	94.7%	3	15.8%
Hampton (Twp)	20	10	50.0%	1	5.0%
Hardyston (Twp)	27	8	29.6%	1	3.7%
Hopatcong (B)	22	0	0.0%	4	18.2%
Lafayette (Twp)	14	7	50.0%	0	0.0%
Montague (Twp)	32	18	56.3%	0	0.0%
Newton (T)	39	14	35.9%	1	2.6%
Ogdensburg (B)	7	5	71.4%	0	0.0%
Sandyston (Twp)	28	11	39.3%	0	0.0%
Sparta (Twp)	74	30	40.5%	0	0.0%
Stanhope (B)	7	0	0.0%	0	0.0%
Stillwater (Twp)	24	12	50.0%	0	0.0%
Sussex (B)	8	0	0.0%	0	0.0%
Vernon (Twp)	74	20	27.0%	3	4.1%

Jurisdiction	Total Critical Facilities and Lifelines Located in Jurisdiction	Carbonate Rock Hazard Area		Landslide Hazard Area - Steep Slope (Greater Than 15-Percent)	
		Critical Facilities and Lifelines	Percent of Total Critical Facilities and Lifelines	Critical Facilities and Lifelines	Percent of Total Critical Facilities and Lifelines
Walpack (Twp)	11	4	36.4%	1	9.1%
Wantage (Twp)	29	2	6.9%	3	10.3%
Sussex County (Total)	**596**	**223**	**37.4%**	**19**	**3.2%**

Source: Sussex County GIS 2020; FEMA 2020; USGS 2014; NJDEP 1999
Note: B – Borough; T - Town; Twp – Township; % - Percent

Table 4.3.6-8. Distribution of Critical Facilities by Type Built on Land with Carbonate Bedrock

Jurisdiction	Facility Types																					
	Airport	Communication Facility	Dam	DPW	Electrical Substation	EMS	EOC	Fire Station	Food Pantry	Fuel	Government Building	Hazardous Material	Police Station	Post Office	Potable Pump Station	Potable Water Treatment	Primary Education	Religious Center	Secondary Education	Senior Center	Shelter	Wastewater Pump	Well
Andover (B)	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
Andover (Twp)	1	3	7	1	0	1	1	3	0	0	0	0	1	0	0	0	1	0	0	2	1	0	0
Branchville (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Byram (Twp)	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Frankford (Twp)	0	0	1	1	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0
Franklin (B)	0	0	1	0	0	1	0	1	0	0	1	1	1	0	0	0	2	0	0	0	1	0	0
Fredon (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green (Twp)	0	0	3	1	0	1	1	1	0	0	1	2	0	2	0	0	4	2	1	0	1	0	0
Hamburg (B)	0	0	2	1	1	1	0	1	0	0	2	4	1	0	0	0	1	0	0	0	1	2	1
Hampton (Twp)	0	0	5	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0	0	1	0	0	0
Hardyston (Twp)	0	0	0	1	0	1	0	1	0	0	1	1	1	0	0	0	2	0	0	0	0	0	0
Hopatcong (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lafayette (Twp)	0	0	1	1	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	2	0	0
Montague (Twp)	0	0	4	1	0	1	0	2	1	0	1	0	0	0	1	0	0	0	0	0	2	0	5
Newton (T)	0	0	0	1	1	1	0	1	0	0	0	1	0	0	1	0	4	0	0	0	0	4	0
Ogdensburg (B)	0	0	0	0	0	1	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0
Sandyston (Twp)	0	0	6	1	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
Sparta (Twp)	0	0	7	2	1	1	1	0	1	0	1	4	1	0	2	0	4	0	0	0	1	3	1
Stanhope (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stillwater (Twp)	0	0	4	1	0	1	0	2	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0
Sussex (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vernon (Twp)	0	0	7	1	0	0	0	1	0	0	1	2	1	0	0	0	5	0	0	0	2	0	0
Walpack (Twp)	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Wantage (Twp)	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0

Jurisdiction	Facility Types																					
	Airport	Communication Facility	Dam	DPW	Electrical Substation	EMS	EOC	Fire Station	Food Pantry	Fuel	Government Building	Hazardous Material	Police Station	Post Office	Potable Pump Station	Potable Water Treatment	Primary Education	Religious Center	Secondary Education	Senior Center	Shelter	Wastewater Pump	Well
Sussex County (Total)	**1**	**3**	**51**	**13**	**3**	**11**	**5**	**20**	**3**	**1**	**13**	**17**	**7**	**3**	**4**	**1**	**29**	**2**	**1**	**3**	**15**	**10**	**7**

Source: Sussex County GIS 2020; USGS 2014
Notes: B = Borough, C = City, Twp = Township, T = Town, % - Percent

Table 4.3.6-9. Distribution of Critical Facilities by Type Built on Land with Steep Slopes (Greater Than 15-Percent)

Jurisdiction	Facility Types									
	Communication Facility	Correctional Facility	Dam	DPW	Potable Pump Station	Primary Education	Senior Center	Shelter	Wastewater Pump	Well
Andover (B)	0	0	0	0	0	0	0	0	0	0
Andover (Twp)	0	0	1	0	0	0	0	0	0	0
Branchville (B)	0	0	0	0	0	0	0	0	0	0
Byram (Twp)	0	0	0	0	0	0	0	0	0	0
Frankford (Twp)	0	0	0	1	0	0	0	0	0	0
Franklin (B)	0	0	0	0	0	0	0	0	0	0
Fredon (Twp)	0	0	0	0	0	0	0	0	0	0
Green (Twp)	0	0	0	0	0	0	0	0	0	0
Hamburg (B)	0	0	0	0	1	0	0	0	1	1
Hampton (Twp)	0	0	1	0	0	0	0	0	0	0
Hardyston (Twp)	0	0	1	0	0	0	0	0	0	0
Hopatcong (B)	0	0	1	0	0	1	1	1	0	0
Lafayette (Twp)	0	0	0	0	0	0	0	0	0	0
Montague (Twp)	0	0	0	0	0	0	0	0	0	0
Newton (T)	0	1	0	0	0	0	0	0	0	0

Jurisdiction	Facility Types									
	Communication Facility	Correctional Facility	Dam	DPW	Potable Pump Station	Primary Education	Senior Center	Shelter	Wastewater Pump	Well
Ogdensburg (B)	0	0	0	0	0	0	0	0	0	0
Sandyston (Twp)	0	0	0	0	0	0	0	0	0	0
Sparta (Twp)	0	0	0	0	0	0	0	0	0	0
Stanhope (B)	0	0	0	0	0	0	0	0	0	0
Stillwater (Twp)	0	0	0	0	0	0	0	0	0	0
Sussex (B)	0	0	0	0	0	0	0	0	0	0
Vernon (Twp)	0	0	3	0	0	0	0	0	0	0
Walpack (Twp)	0	0	1	0	0	0	0	0	0	0
Wantage (Twp)	1	0	2	0	0	0	0	0	0	0
Sussex County (Total)	**1**	**1**	**10**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

Source: Sussex County GIS 2020; NJDEP 1999
Notes: B = Borough, C = City, Twp = Township, T = Town, % = Percent
Note: Asset types that are not listed in the tables were not exposed to the flood hazard.

Table 4.3.6-10. Number of Lifelines Located on Carbonate Rock

FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Exposed to the Carbonate Rock Hazard Area
Communications	9	3
Energy	12	4
Food, Water, Shelter	75	39
Hazardous Materials	20	17
Health and Medical	15	4
Safety and Security	463	155
Transportation	2	1
Sussex County (Total)	**596**	**223**

Source: Sussex County GIS 2020; FEMA 2020; USGS 2014

Table 4.3.6-11. Number of Lifelines Built on Steep Slopes (>15-percent)

FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Exposed to the Landslide - Steep Slope (Greater Than 15-Percent) Hazard Area
Communications	9	1
Energy	12	0
Food, Water, Shelter	75	4
Hazardous Materials	20	0
Health and Medical	15	1
Safety and Security	463	13
Transportation	2	0
Sussex County (Total)	**596**	**19**

Source: Sussex County GIS 2020; FEMA 2020; USGS 2014

In addition to critical facilities, a significant amount of infrastructure can be exposed to mass movements of geological material:

- *Roads*—Access to major roads is crucial to life-safety after a disaster event and to response and recovery operations. Landslides can block egress and ingress on roads, causing isolation for neighborhoods, traffic problems, and delays for public and private transportation. This can result in economic losses for businesses.
- *Bridges*—Landslides can significantly impact road bridges. Mass movements can knock out bridge abutments or significantly weaken the soil supporting them, making them hazardous for use.
- *Power Lines*—Power lines are generally elevated above steep slopes; but the towers supporting them can be subject to landslides. A landslide could trigger failure of the soil underneath a tower, causing it to collapse and ripping down the lines. Power and communication failures due to landslides can create problems for vulnerable populations and businesses.
- *Rail Lines*—Similar to roads, rail lines are important for response and recovery operations after a disaster. Landslides can block travel along the rail lines, which would become especially troublesome, because it would not be as easy to detour a rail line as it is on a local road or highway. Many residents rely on public transport to get to work around the County and into New York City, and a landslide event could prevent travel to and from work.

Several other types of infrastructure may also be exposed to the geologic hazards, including water and sewer infrastructure. The miles of roads exposed to landslide and carbonate hazard areas are summarized in Table 4.3.6-12. Out of the 1,771 miles of roads in the County, 389 miles are built on steep slopes (>15%) and 862 miles are located on carbonate rock.

Table 4.3.6-12. Major Transportation Routes Exposed to Steep Slope and Carbonate Hazard Areas

Road Type	Total Miles for County	Landslide - Steep Slope (Greater Than 15-Percent) Hazard Area		Carbonate Rock Hazard Area	
		Miles	Percent of Total	Miles	Percent of Total
Local and Private Roads	1,337	228	17.1%	471	35.2%
County Roads	313	154	49.2%	353	112.8%
State Routes	86	6	6.5%	28	32.9%
US Highways	34	1	3.5%	9	26.8%
Interstate	1	<1	<.1%	<1	<0.1%
County Total	**1,771**	**389**	**22.0%**	**862**	**48.7%**

Source: Sussex County GIS 2020; USGS 2014; NJDEP 1999; NJDOT 2017
Note: % - Percent

Impact on the Economy

Geologic hazards can impose direct and indirect impacts on society. Direct costs include the actual damage sustained by buildings, property, and infrastructure due to ground failure, which also threatens transportation corridors, fuel and energy conduits, and communication lines (USGS 2020). Indirect costs, such as clean-up costs, business interruption, loss of tax revenues, reduced property values, and loss of productivity may also occur, but are difficult to measure. Buildings susceptible to landslide events were summarized earlier in this section. Losses to these structures will impact the local tax base and economy.

Impact on the Environment

Steep slopes within the Highlands Region play an important ecological, recreational, scenic, and functional role. They provide specialized habitats for rare plant and animal species. Areas of steep slope provide recreational opportunities and contribute to the rural character of the Highlands Region and Sussex County. Disturbance of areas containing steep slopes can trigger erosion and sedimentation, resulting in the loss of topsoil. Silting of wetlands, lakes, ponds, and streams damages and degrades wetland and aquatic habitats that are found throughout the region and receive the State's highest water quality protections. Steep slope disturbance can also result in the loss of habitat quality, degradation of surface water quality, silting of wetlands, and alteration of drainage patterns (NJ Highlands Council 2012).

Future Changes That May Impact Vulnerability

Understanding future changes that effect vulnerability in the County can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

Any areas of growth could be potentially impacted by the geologic hazard if located within the identified hazard areas or downslope. In general, development of slopes is not recommended due to the increased risk of erosion, stormwater runoff and flooding potential. The additional runoff results in sedimentation of down slope surface waters, which damages habitat and has the potential to damage property. The Highlands Council has template ordinances available to define Steep Slope Protection Areas and protect from their disturbance. In addition, there are recommendations for site design for permitted disturbances to minimize impacts.

A spatial analysis was conducted to determine the intersection of potential new development with steep slopes and carbonate soil. The exposure analysis shows that six new developments will be built in steep slope hazard area and 27 new developments will be built in the carbonate soil hazard area: refer to Figure 4.3.6-7 and Figure 4.3.6-7

Projected Changes in Population

Sussex County has experienced population decline since 2010. According to the U.S. Census Bureau, the County's population has decreased 4.7-percent between 2010 and 2018 (U.S. Census Bureau 2020). The population is expected to continue to decrease as residents move away from the suburbs and towards urban centers (Stirling 2018). Even though the population has decreased over the past decade, any changes in the density of population can impact the number of persons exposed to geologic hazard areas. Changes in density can not only create issues for local residents during evacuation of a landslide or ground failure event, but can also have an effect on commuters that travel into and out of the County for work, particularly during a geologic event that breaches major transportation corridors, which are also major commuter roads.

Climate Change

A direct impact of climate change on landslides is difficult to determine. Multiple secondary effects of climate change have the potential to increase the likelihood of landslides. Warming temperatures resulting in wildfires would reduce vegetative cover along steep slopes and destabilize the soils due to destruction of the root system; increased intensity of rainfall events would increase saturation of soils on steep slopes. Under these future conditions, the County's assets located on or at the base of these steep slopes will have an increased risk to

landslides. Roadways and other transportation infrastructure located in these areas will also be at an increased risk of closure, which would impact the County's risk as described above.

Higher temperatures and the possibility of more intense, less frequent summer rainfall may lead to changes in water resource availability. Increase in average temperatures may lead to an increase in the frequency of droughts. Sinkhole activity intensifies in some karst areas during periods of drought. With an increase in drought periods, the number of sinkholes could increase. Additionally, changes to the water balance of an area including over-withdrawal of groundwater, diverting surface water from a large area and concentrating it in a single point, artificially creating ponds of surface water, and drilling new water wells will cause sinkholes. These actions can also serve to accelerate the natural processes of bedrock degradation, which can have a direct impact on sinkhole creation.

Vulnerability Changes Since the 2016 HMP

This updated HMP has utilized updated building stock and critical asset inventories to assess the County's risk to the geologic hazard areas. The building inventory was updated using RS Means 2020 values, which is more current and reflects replacement cost versus the building stock improvement values reported in the 2016 HMP. Further, the 2018 5-year population estimates from the American Community Survey were used to evaluate the population exposed to the dam inundation areas. Additionally, the 2014 carbonate rock layer from USGS and the 1999 digitized contours from NJDEP were referenced to assess the County's assets to the geologic hazard. Overall, signification increase in vulnerability would be attributed to changes in population density, impacts from storm events, and new development.

Figure 4.3.6-6 Carbonate Rock and New Development in Sussex County

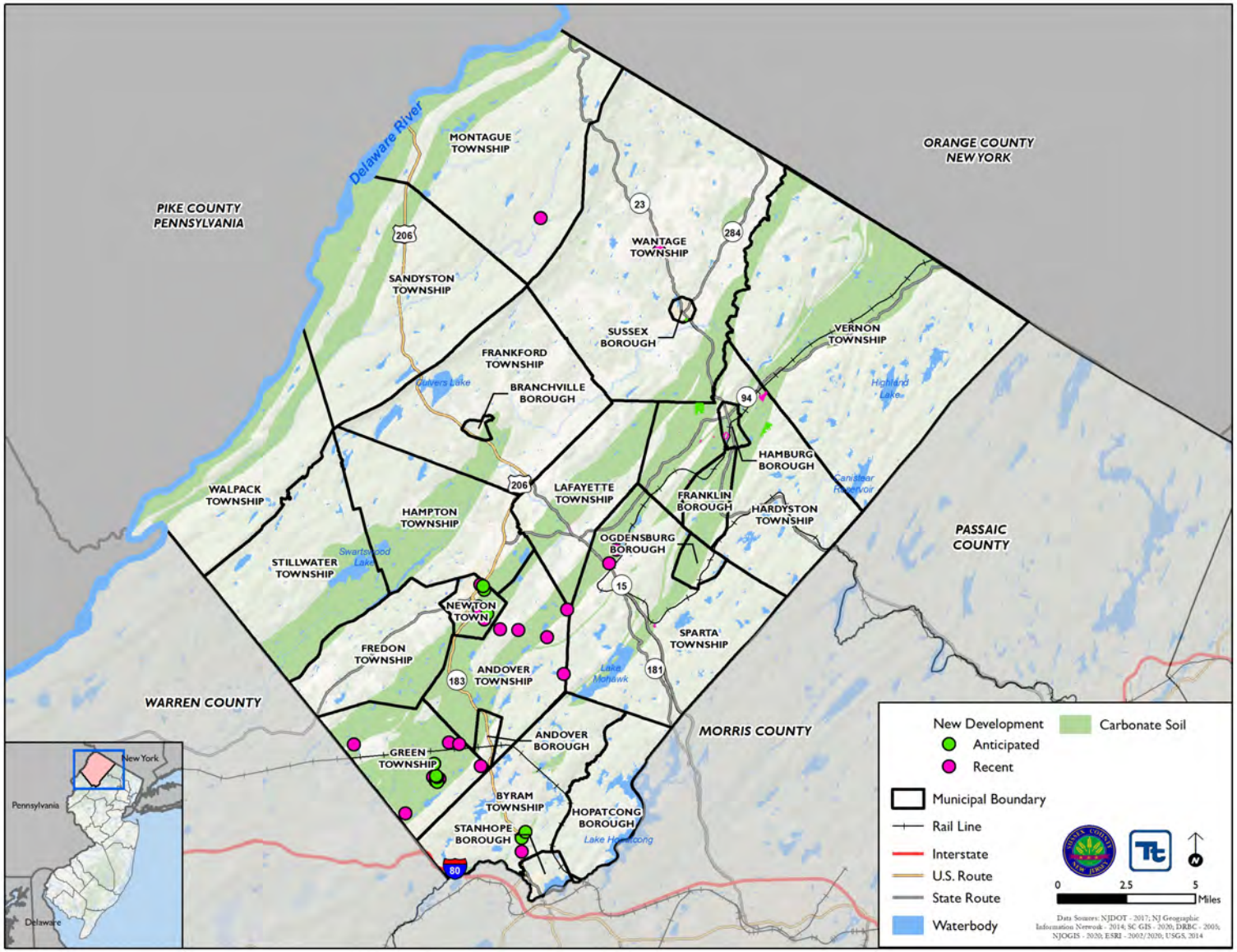
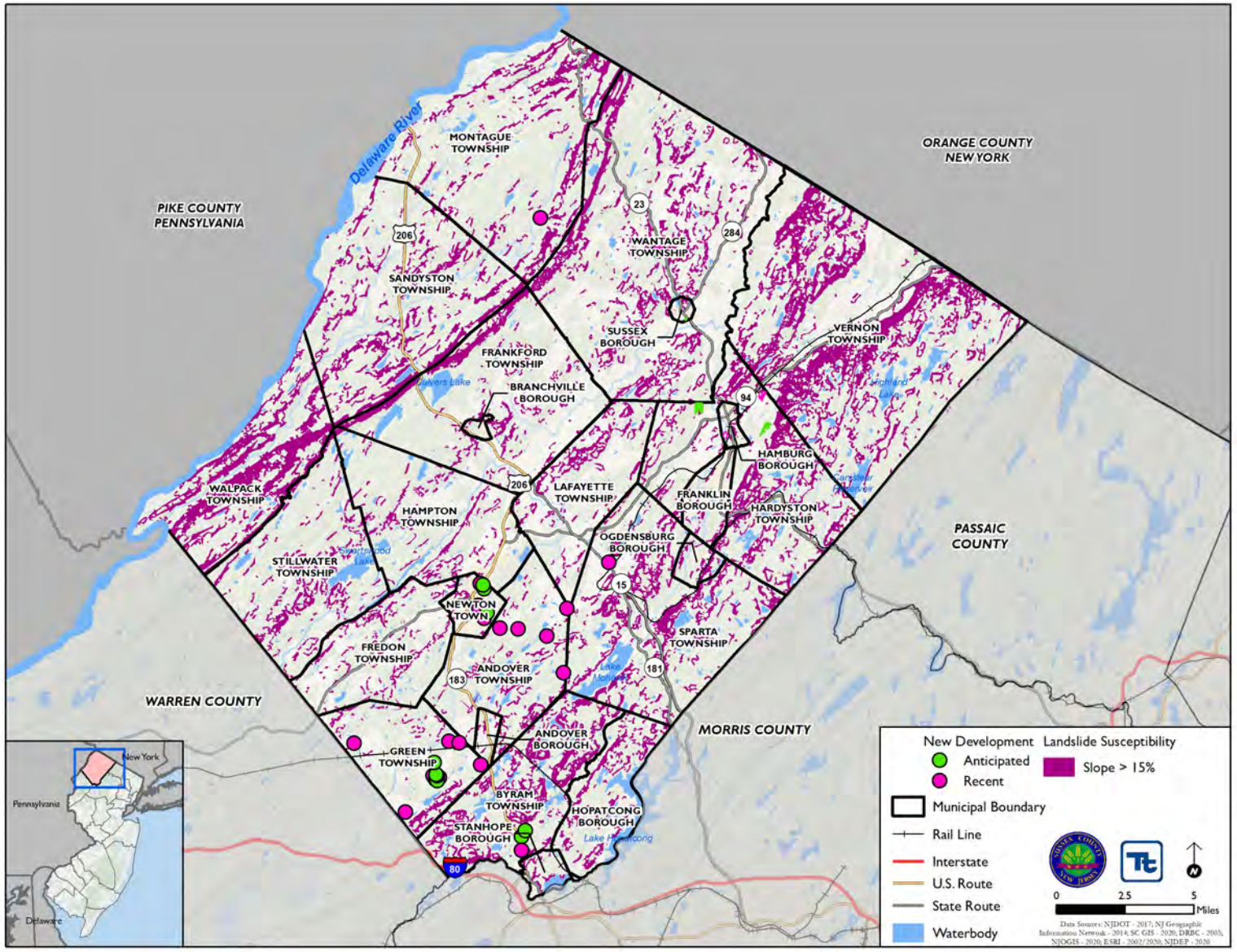


Figure 4.3.6-7 Steep Slope and New Development in Sussex County



4.3.7 HAZARDOUS MATERIALS RELEASE

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the hazardous materials hazard in Sussex County.

2021 HMP Changes

- New and updated figures from federal and state agencies are incorporated.
- Previous occurrences were updated with events that occurred between 2015 and 2020.
- A vulnerability assessment was conducted for the hazardous materials hazard and it now directly follows the hazard profile.

Profile

Hazard Description

Hazardous substances are materials that are considered severely harmful to human health and the environment, as defined by the United States Environmental Protection Agency (USEPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Superfund Law). Many are commonly used substances which are harmless in their normal uses but are quite dangerous if released. The Superfund law designates more than 800 substances as hazardous and identifies many more as potentially hazardous due to their characteristics and the circumstances of their release (USEPA 2013). Superfund's definition of a hazardous substance includes the following:

- Any element, compound, mixture, solution, or substance designated as hazardous under section 102 of CERCLA.
- Any hazardous substance designated under section 311(b)(2)(a) of the Clean Water Act (CWA), or any toxic pollutant listed under section 307(a) of the CWA. There are over 400 substances designated as either hazardous or toxic under the CWA.
- Any hazardous waste having the characteristics identified or listed under section 3001 of the Resource Conservation and Recovery Act.
- Any hazardous air pollutant listed under section 112 of the Clean Air Act, as amended. There are over 200 substances listed as hazardous air pollutants under the Clean Air Act (CAA).
- Any imminently hazardous chemical substance or mixture which the EPA Administrator has "taken action under" section 7 of the Toxic Substances Control Act (USEPA 2013).

If released or misused, hazardous substances can cause death, serious injury, long-lasting health effects, and damage to structures and other properties, as well as the environment. Many products containing hazardous substances are used and stored in homes and these products are shipped daily on highways, railroads, waterways, and pipelines.

Transportation of hazardous substances on highways involves tanker trucks or trailers, which are responsible for the greatest number of hazard substance release incidents. New Jersey is composed of approximately 39,000 miles of highway, many of which are used to transport hazardous substances (New Jersey Department of Transportation [NJDOT] 2019). These roads cross rivers and streams at many points; hazardous substance spills on roads have the potential to pollute watersheds that serve as domestic water supplies for parts of the State. Potential also exists for hazardous substance releases to occur along rail lines as collisions and derailments of train cars can result in large spills.

Additionally, oil is shipped by rail throughout New Jersey. The adoption of hydraulic fracturing ("fracking") to extract oil and gas has led to an increase in the production and shipment of energy products. Lack of pipelines connecting the energy-producing regions with refineries or ports, coupled with the flexibility that railroad transportation provides, have resulted in significant shipments of oil by rail. Major commodities shipped by rail include petrochemicals (including plastic pellets and crude oil), construction materials, food products, raw materials and finished goods for manufacturers (NJ DOT 2018).

Pipelines can also transport hazardous liquids and flammable substances such as natural gas and petroleum. Incidents can occur when pipes corrode, when they are damaged during excavation, incorrectly operated, or damaged by other forces. In New Jersey, most of the large pipeline leaks have been caused by marine traffic hitting or the anchors of ships effecting pipelines in the waterways. In addition, hazardous substances can be transported by aircraft or by watercraft. Crashes, spills of materials, and fires on these vessels can pose a hazard.

Nuclear incidents can also be considered a form of environmental hazard. Nuclear incidents generally refer to incidents involving (1) release of significant levels of radioactive materials or (2) exposure of workers or the general public to radiation. Primary concerns following a nuclear incident or accident are: impact on public health from direct exposure to a radioactive plume; inhalation of radioactive materials; ingestion of contaminated food, water, and milk; and long-term exposure to deposited radioactive materials in the environment that may lead to either acute (radiation sickness or death) or chronic (cancer) health effects.

The Sussex County Hazardous Materials (HAZMAT) Team was developed to support the County in the response of any HAZMAT or Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) incident. The team is comprised of approximately 20 full-time County employees who have completed the Hazardous Materials Technician course and is a collaborative effort between the County's Sheriff's Office, Office of the Prosecutor, Division of Public Works, and Department of Environmental and Public Health Services. It has also been recognized by the New Jersey Department of Environmental Protection as a Model Program for HAZMAT response (Sussex County 2015).

Location

The following provides information regarding the location of hazardous substance incidents.

Hazardous Substances Fixed Site

Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. These types of substances are most often released as a result of transportation accidents or a chemical spill at a facility. Many products containing hazardous materials are also used and stored in homes.

In response to concerns regarding health and environmental risks, Congress established the Superfund program in 1980 to clean up these sites. The Superfund program is administered by the USEPA in cooperation with individual states. In New Jersey, the Department of Environmental Protection (NJDEP) Site Remediation Program oversees the Superfund program (NJDEP 2013).

Federal regulations include the CERCLA and the Superfund Amendments and Reauthorization Act (SARA) required that a National Priorities List (NPL) of sites throughout the United States be maintained and revised at least annually (NJDEP 2013).

Fixed-site facilities that use, manufacture, or store hazardous substances in New Jersey pose risk and must comply with Title III of the federal SARA. SARA was signed into law on October 17, 1986. It is a federal law that applies nationwide. It must be realized that this law is linked to N.J.S.A. 34:5A, the New Jersey Worker and Community Right to Know Act. SARA requires the governor of each state to establish a State Emergency

Response Commission (SERC). New Jersey's SERC was established by Executive Order on February 13, 1987. SARA also requires that the emergency planning districts be established by the SERC. The Act specified that these districts can be existing political subdivisions. The function of the emergency planning district is to facilitate preparation and implementation of emergency plans. In New Jersey, all municipalities and counties have been designated emergency planning districts (total of 588). The Local Emergency Planning Committees (LEPC) is the policy body for the emergency planning district (New Jersey Division of Fire Safety 2011).

The State enacted the Toxic Catastrophe Prevention Act (TCPA), N.J.S.A. 13:1K-19 et seq. Currently, implementation of the requirements established under this Act is facilitated by the TCPA Program. Certain industrial facilities using materials considered extraordinarily hazardous must take steps to prevent releases and protect public safety. New Jersey has also mandated that facilities storing large quantities of hazardous substances take preventative measures to reduce the likelihood of a leak or discharge. Established under the New Jersey Spill Compensation and Control Act (N.J.S.A. 58:10-23.11), these requirements include testing and inspection of storage tanks, training of employees, and emergency response planning. The Discharge Prevention Containment and Countermeasure (DPCC) program facilitates implementation of these requirements. Regulations related to reporting of chemical and petroleum discharges are also administered under this program. The Program is sometimes referred to by the acronym DPCC, which refers to an important preparedness document that major facilities develop under the program (NJDEP 2018).

The Community Right to Know (CRTK) program collects, processes, and disseminates the chemical inventory, environmental release and materials accounting data required to be reported under the New Jersey Worker and Community Right to Know Act, N.J.S.A.34:5A and the federal Emergency Planning and Community Right to Know Act of 1986 (EPCRA). EPCRA is also known as Title III of the SARA. This information is used by the public, emergency planners, and first responders to determine the chemical hazards in the community (NJDEP 2012).

The U.S. EPA Hazardous Waste Report, which is a biennial report, collects data on the generation, management, and minimization of hazardous waste. This report provides detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage, and disposal facilities. This report lists 27 facilities in Sussex County (U.S. EPA 2019).

Superfund is a program administered by the U.S. EPA to locate, investigate, and cleanup the worst hazardous waste sites throughout the U.S. Data from the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database indicated that Sussex County has three Superfund sites located in Sparta Township, Byram, and Franklin Borough (U.S. EPA 2020).

New Jersey employers, whose businesses are assigned North American Industry Classification System (NAICS) codes listed in the New Jersey Worker and Community Right to Know (CRTK) regulations, are required to submit CRTK surveys listing the environmental hazardous substances (EHSs) present at their facilities in quantities that exceed 500 pounds, unless the EHS is on the federal Emergency Planning and Community Right to Know Act (EPCRA) Section 302 list of extremely hazardous substances with a lower reporting threshold. In addition, Section 312 of EPCRA requires owners and operators of federal facilities and private sector facilities that are subject to the United States Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard to report their inventories of any chemical that requires a Materials Safety Data Sheet (MSDS) and is present on site in quantities that exceed 10,000 pounds, unless the chemical is an Extremely Hazardous Substance with a lower reporting threshold (NJDEP 2014).

Owners and operators of manufacturing, and select non-manufacturing companies, having the equivalent of 10 or more full-time employees, and manufacturing, importing, processing or otherwise using toxic chemicals listed

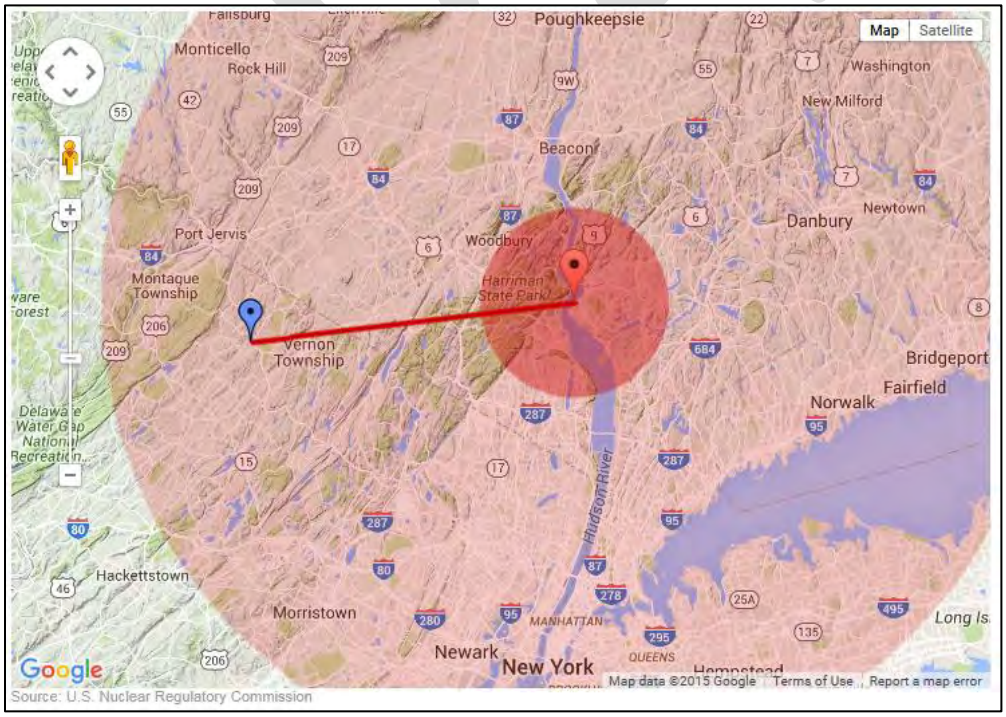
on the EPCRA Section 313 (TRI) list in quantities that exceed specified thresholds, are required to annually report their releases of these chemicals for the previous year. Approximately 500 New Jersey companies are required to file federal Toxic Chemical Release Inventory (TRI) forms. TRI Form R requires the listing of environmental releases, on-site waste management and off-site transfers while the simplified Form A Certification Statement requires the listing of the chemical only. These companies are also required to submit to NJDEP the Release and Pollution Prevention Report (RPPR) listing the quantities of environmental release, on-site waste management, waste transfer, and chemical throughput information. Most of these facilities are also subject to Pollution Prevention Planning Requirements and, therefore, required to report pollution prevention progress information on the RPPR (NJDEP 2014).

Nuclear Facilities

Although there are no nuclear facilities within Sussex County limits, the County is within 50 miles of Indian Point Energy Center. Indian Point Energy Center is located in Buchanan, New York, and provides about 25 percent of New York City and Westchester County New York's power (Safe.Secure.Vital 2015).

In nuclear preparedness planning, the 10 mile and 50 mile radiuses around nuclear facilities are important location boundaries. The Nuclear Regulatory Commission encourages the use of Probabilistic Risk Assessments (PRA) to estimate quantitatively the potential risk to public health and safety considering the design, operations, and maintenance practices at nuclear power plants. Preparedness plans typically consider the Plume Exposure Pathway Emergency Planning Zone (EPZ), which has a radius of 10 miles from the facility, and the Ingestion Exposure Pathway (IEP), which has a radius of 50 miles from each facility. Sussex County is located within the 50-mile IEP. Should an accident occur at the Indian Point Energy Center, the area within the IEP could receive some radioactive contamination. Figure 4.3.7-1 displays where Sussex County falls in Indian Point Energy Center's EPZ and IEP.

Figure 4.3.7-1. Indian Point Energy Center's EPZ and IEP



Source: CNN 2015

Note: The red marker indicates the nuclear facility and the blue marker indicates a location in Sussex, NJ.

Hazardous Substances In-Transit

Incidents involving hazardous substances in transit can occur anywhere in Sussex County. Major highways in the Cunty over which hazardous materials are transported daily include U.S. Route 206 and State Highway 15. A very small portion of Interstate 80 runs through and near the southern portion of the County, and U.S. Route 209 runs parallel and close to the northwestern border of Sussex County although it does not enter County limits. While Sussex County does not offer passenger service, it does maintain freight rail. This freight rail is operated by regional and short line railroads. The rail lines move between 100,001 and 300,000 tons of inbound rail freight and less than 10,000 tons of outbound rail freight (New Jersey Rail System 2012).

Hazardous substances can also be transported via pipeline across the State. New Jersey has an extensive network of natural gas and petroleum pipelines. Several of the petroleum pipelines originate in the Gulf Coast region (Colonial Pipeline and Buckeye Pipeline). Figure 4.3.7-2 shows the extent and locations of pipelines throughout the northeastern United States.

Extent

The extent of a hazardous substance release will depend on whether it is from a fixed or mobile source, the size of impact, the toxicity and properties of the substance, duration of the release, and the environmental conditions (for example, wind and precipitation, terrain, etc.).

Hazardous substance releases can contaminate air, water, and soils, possibly resulting in death and/or injuries. Dispersion can take place rapidly when the hazardous substance is transported by water and wind. While often accidental, releases can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary events. Hazardous substances can include toxic chemicals, radioactive substances, infectious substances, and hazardous wastes. Such releases can affect nearby populations and contaminate critical or sensitive environmental areas.

With a hazardous substance release, whether accidental or intentional, several potentially exacerbating or mitigating circumstances will affect its severity or impact. Mitigating conditions are precautionary measures taken in advance to reduce the impact of a release on the surrounding environment. Primary and secondary containment or shielding by sheltering-in-place measures protects people and property from the harmful effects of a hazardous substance release. Exacerbating conditions, characteristics that can enhance or magnify the effects of a hazardous substance release, include:

- Weather conditions, which affect how the hazard occurs and develops
- Micro-meteorological effects of buildings and terrain, which alters dispersion of hazardous substances on-compliance with applicable codes (such as building or fire codes)
- Maintenance failures (such as fire protection and containment features), which can substantially increase the damage to the facility itself and to surrounding buildings

As discussed earlier, the severity of the incident is dependent not only on the circumstances described above, but also with the type of substance released and the distance and related response time for emergency response teams. The areas proximate to the releases are generally at greatest risk; however, depending on the agent, a release can travel great distances or remain present in the environment for a long period of time (i.e. centuries to millennia).

Figure 4.3.7-2. Major Transportation in Sussex County

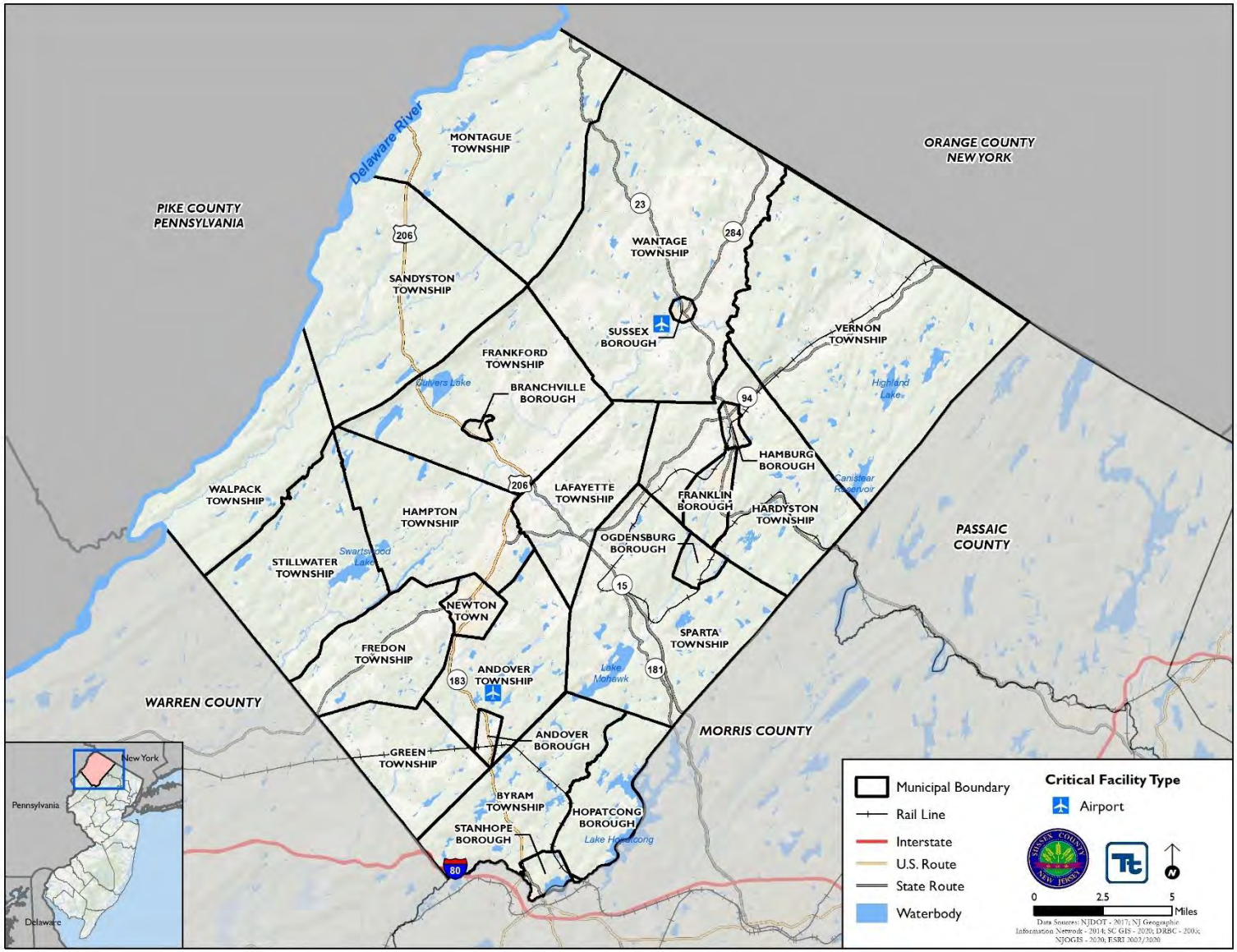
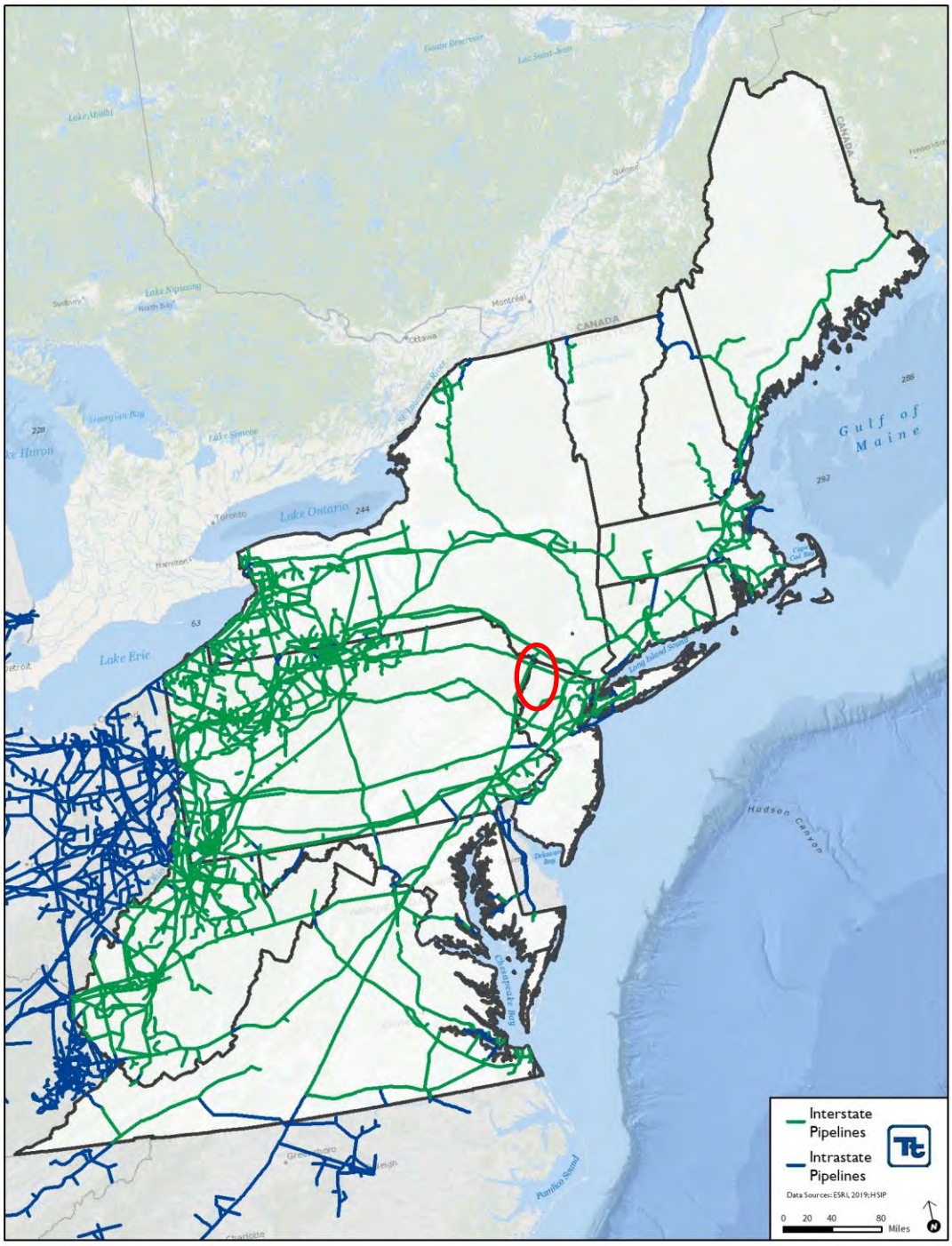


Figure 4.3.7-3. Interstate Natural Gas Pipelines in the Northeast



Source: NJDOT, n.d.

Note: The approximate location of Sussex County is indicated by the red circle.

Figure 4.3.7-4. Hazardous Material Sites with One Mile Buffer in Sussex County

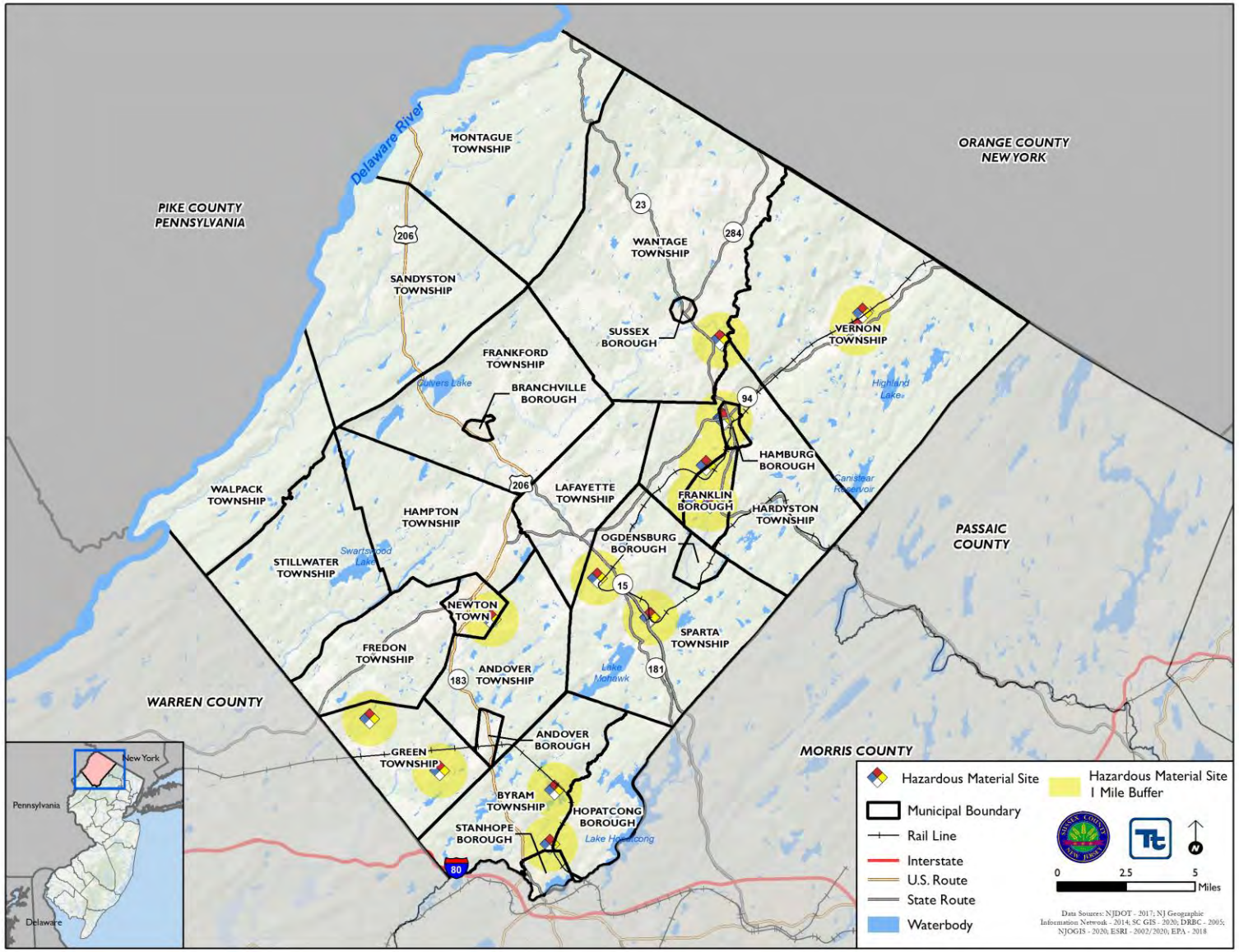


Figure 4.3.7-5 Railways with One Mile Buffer in Sussex County

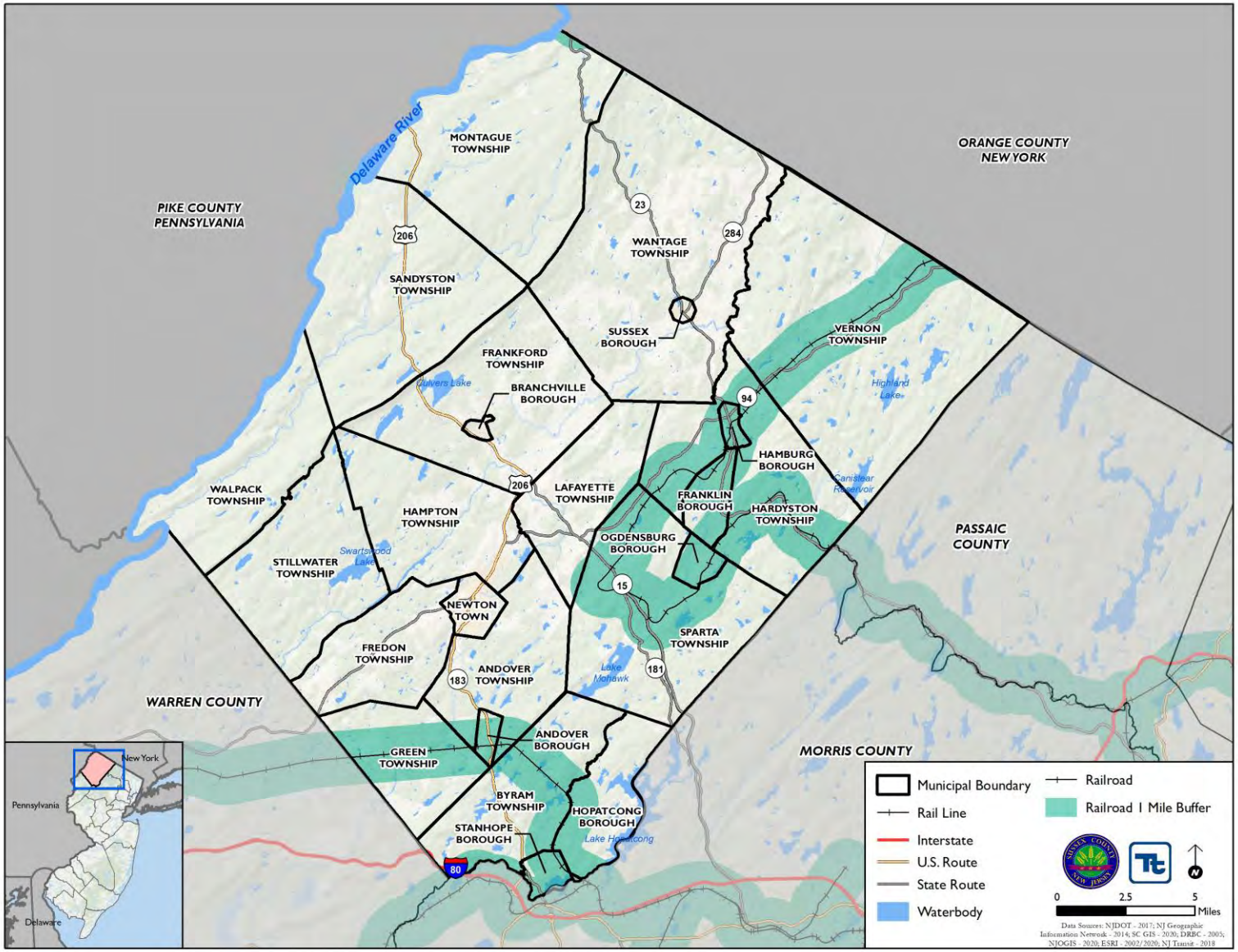
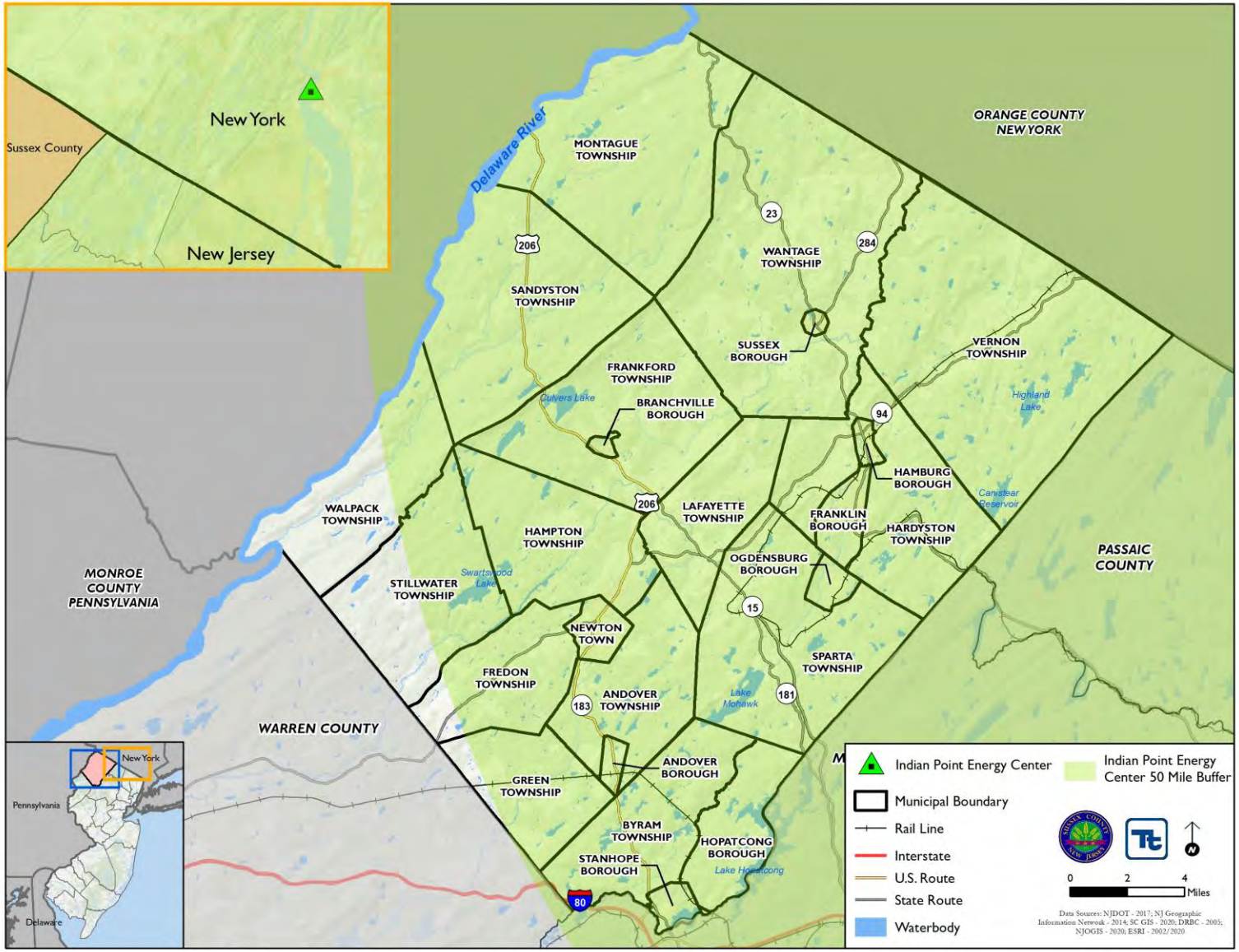


Figure 4.3.7-6 Indian Point Energy Center with Fifty Mile Buffer



Previous Occurrences and Losses

For the 2020 HMP update, known hazardous substances incidents that have impacted Sussex County between 2015 and 2020 are identified in 4.3.7-1. Refer to Section (Jurisdictional Annex) 9 for detailed information regarding impacts and losses to each municipality, where available.

FEMA Disaster Declarations

Between 1954 and 2020, the State of New Jersey was not included in any FEMA declared disasters (DR) or emergencies (EM) related to hazardous substances incidents (FEMA 20).

USDA Disaster Declarations

Agriculture-related disasters are quite common. The USDA Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. From 2015 to 2020, Sussex County was not included in any agriculture-related disasters (USDA 2020).

Table 4.3.7-1. Hazardous Substances Events in Sussex County, 2015 to 2020

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Description
2015	Chemical Release	N/A	N/A	In 2015, 11,374 pounds of chemicals were released on-site in Sussex County.
2015	Accidents involving hazardous materials	N/A	N/A	In 2015, Sussex County experienced 1 rail accident involving hazardous materials.
2016	Chemical Release	N/A	N/A	In 2016, 10,578 pounds of chemicals were released on-site in Sussex County.
2017	Chemical Release	N/A	N/A	In 2017, 8,853 pounds of chemicals were released on-site in Sussex County.
2018	Chemical Release	N/A	N/A	In 2018, 6,155 pounds of chemicals were released on-site in Sussex County.
2019	Chemical Release	N/A	N/A	In 2019, 261 pounds of chemicals were released on-site in Sussex County.

Source: NJ HMP 2019; EPA TRI Explorer 2020
With hazardous substances incidents for New Jersey and Sussex County being so extensive, not all sources have been identified or researched. Therefore, not all events that have occurred in the County may be included.

Probability of Future Occurrences

Predicting future hazardous substance incidents in Sussex County is difficult. They can occur at anytime and anywhere in the county. Incidents can be sudden without any warning or slowly develop. Small spills, both fixed site and in-transit, occur throughout the year and the probability for these events are high. The risk of major incidents in a given year is rare. It is estimated that the county will continue to experience direct and indirect impacts of hazardous substance incidents annually that may induce secondary hazards such as infrastructure deterioration or failure, water quality and supply concerns, and transportation delays, accidents and inconveniences.

According to the 2011 HMP, the Right-to-Know Network database, and the Pipeline and Hazardous Materials Safety Administration (PHMSA), Sussex County experienced 96 hazardous material incidents (fixed site and in-

transit) between 1950 and 2015. Please note that only readily available data was used for the calculations and not all events may have been included. Based on the number of occurrences, the county has a 145.45 percent chance of a hazardous material incident (fixed site or in-transit) of occurring in any given year. The table below shows these statistics, as well as the annual average number of events and the percent chance of these incidents occurring in Sussex County in future years (Sussex County HMP 2011; Right-to-Know Network 2016; PHMSA 2016).

Table 4.3.7-2. Probability of Future Hazardous Materials Incidents

Hazard Type	Number of Occurrences Between 1950 and 2015	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	Percent chance of occurrence in any given year
Hazardous Materials (fixed site)	54	0.83	1.2	0.82	81.8%
Hazardous Materials (in-transit)	42	0.65	1.6	0.64	63.6%

Source: Sussex County HMP 2011; Right-to-Know Network 2016; PHMSA 2016

In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for the hazardous substances hazard in the county is considered 'frequent' (100 percent annual probability; a hazard event may occur multiple times per year, as presented in Table 4.4-1). The ranking of the hazardous substances hazard for individual municipalities is presented in the jurisdictional annexes.

Climate Change Impacts

Hazardous substance incidents are non-natural incidents; however, their release may be the result from natural hazard events. As noted in the risk assessment, climate change may potentially increase the frequency and magnitude of flood and severe weather events which may lead to an increased release of hazardous substances at both fixed sites and in-transit. Secondary impacts, such as excessive heat on containers may occur, but also can occur during normal fluctuations in temperature.

Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable to the identified hazard. Sussex County's vulnerability to the hazardous materials hazard was evaluated by conducting an exposure analysis of the County's assets (i.e., population, buildings, critical facilities, and new development) built within a 1-mile buffer of identified hazardous material facilities, within 1 mile of all railways, and within 50 miles of the Indian Point Energy Center.

Impact on Life, Health and Safety

Depending on the type and quantity of chemicals released and the weather conditions, an incident can affect larger areas that cross jurisdictional boundaries. When hazardous substances are released in the air, water or on land they may contaminate the environment and pose greater danger to human health. Exposure may be either acute or chronic, depending upon the nature of the substance and extent of release and contamination.

Due to the varied location of different hazardous substances and waste sites in Sussex County, the entire County is considered vulnerable to this hazard. Those particularly vulnerable include populations located along railways routes because of the quantities of chemicals transported on these major thoroughfares. Potential losses from

hazardous substances incidences include human health and life and property resources. These types of incidents can lead to injury, illnesses, and/or death from both the involved persons and those living in the impacted areas.

An exposure analysis estimates there are 39,025 persons, 19,301 persons, and 140,839 persons living within 1 mile of railways, within 1 mile of hazardous material sites, and within 50 miles of the Indian Point Energy Center, respectively. The Township of Vernon has the greatest number of people living within 1 mile of railways and 50 miles of the Indian Point Energy Center, with 7,740 and 22,369 persons, respectively. The Town of Newton has the greatest number of people living within 1 mile of a hazardous material site (4,825 persons). Refer to Table 4.3.7-3 for population exposure to hazardous material incidents by jurisdiction

Table 4.3.7-3. Estimated Number of Persons Living Near Hazardous Materials Hazard Areas

Jurisdiction	Total Population	Population Exposed to Hazardous Material Release Incidents					
		Within a Mile of a Railroad		Within a Mile of a Hazardous Site		Within 50 Miles of Indian Point Energy Center	
		Number of People	Percent of Total	Number of People	Percent of Total	Number of People	Percent of Total
Andover (B)	594	510	85.9%	0	0.0%	594	100.0%
Andover (Twp)	5,996	148	2.5%	596	9.9%	5,996	100.0%
Branchville (B)	896	0	0.0%	0	0.0%	896	100.0%
Byram (Twp)	8,010	3,688	46.0%	1,657	20.7%	8,010	100.0%
Frankford (Twp)	5,361	0	0.0%	0	0.0%	5,361	100.0%
Franklin (B)	4,807	4,648	96.7%	3,898	81.1%	4,807	100.0%
Fredon (Twp)	3,214	0	0.0%	42	1.3%	3,034	94.4%
Green (Twp)	3,495	1,612	46.1%	1,008	28.8%	3,264	93.4%
Hamburg (B)	3,152	3,152	100.0%	2,807	89.1%	3,152	100.0%
Hampton (Twp)	4,916	0	0.0%	0	0.0%	4,916	100.0%
Hardyston (Twp)	7,886	5,064	64.2%	1,088	13.8%	7,886	100.0%
Hopatcong (B)	14,362	3,825	26.6%	259	1.8%	14,362	100.0%
Lafayette (Twp)	2,390	95	4.0%	107	<0.1%	2,390	100.0%
Montague (Twp)	3,716	12	0.3%	0	0.0%	3,716	100.0%
Newton (T)	7,895	0	0.0%	4,825	61.1%	7,895	100.0%
Ogdensburg (B)	2,314	2,222	96.0%	0	0.0%	2,314	100.0%
Sandyston (Twp)	1,925	0	0.0%	0	0.0%	1,925	100.0%
Sparta (Twp)	18,841	3,166	16.8%	1,212	6.4%	18,841	100.0%
Stanhope (B)	3,377	3,144	93.1%	984	29.1%	3,377	100.0%
Stillwater (Twp)	3,936	0	0.0%	0	0.0%	2,893	73.5%
Sussex (B)	1,854	0	0.0%	0	0.0%	1,854	100.0%
Vernon (Twp)	22,369	7,740	34.6%	686	3.1%	22,369	100.0%
Walpack (Twp)	6	0	0.0%	0	0.0%	1	18.2%
Wantage (Twp)	10,986	0	0.0%	132	1.2%	10,986	100.0%
Sussex County (Total)	**142,298**	**39,025**	**27.4%**	**19,301**	**13.6%**	**140,839**	**99.0%**

Source: Sussex County GIS 2020; American Community Survey 2018; EPA 2018; NJ Transit - 2018
Note: B – Borough; T – Town; Twp – Township; % - Percent

Impact on General Building Stock

Potential losses to the general building stock caused by a hazardous substance releases, whether in transit or at fixed sites, is difficult to quantify. The degree of damages depends on the scale of the incident. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content losses if an explosion occurs. The closure of waterways, railroads, airports and highways as a result of a hazardous substance incident has the potential to impact the ability to deliver goods and services efficiently. Potential impacts may be local, regional, or statewide depending on the magnitude of the event and level of service disruptions.

An exposure analysis estimates there are 20,025 buildings or approximately $17.1 billion, 9,087 buildings or approximately $13.2 billion, and 70,919 buildings or approximately $59.1 billion living within 1 mile of all railways, within 1 mile of hazardous material sites, and within 50 miles of the Indian Point Energy Center, respectively. The Township of Vernon has the greatest number of buildings within 1 mile of a railway and 50 miles of the Indian Point Energy Center, with 4,337 and 12,039 structures, respectively. The Borough of Franklin has the greatest number of buildings located within 1 mile of a hazardous material site (1,700 structures). Refer to Table 4.3.7-4 for building exposure to hazardous material incidents by jurisdiction.

Impact on Critical Facilities and Lifelines

Potential losses to critical assets caused by a hazardous substances incident is difficult to quantify. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content losses if an explosion occurs.

An exposure analysis estimates there are 164 critical facilities, 108 critical facilities, and 571 critical facilities built within 1 mile of all railways, within 1 mile of hazardous material sites, and within 50 miles of the Indian Point Energy Center, respectively. The Township of Sparta have the greatest number of critical facilities within 1 mile of railways, within 1 mile of hazardous material sites, and within 50 miles of the Indian Point Energy Center (i.e. 36, 20, and 74 critical facilities, respectively). Refer to Tables 4.3.7-5 through 4.3.7-9 to review the number of critical facilities and lifelines located within 1-mile of railways, 1-mile of hazardous material sites and 50-miles of the Indian Point Energy Center.

Table 4.3.7-4 Estimated Number of Buildings and Replacement Cost Value Within Hazardous Material Hazard Areas

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposed to Hazardous Material Release Incidents											
			Within 1 Mile of a Railroad				Within 1 Mile of a Hazardous Site				Within 50 Miles of Indian Point Energy Center			
			Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total	Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total	Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total
Andover (B)	328	$628,463,030	282	86.0%	$599,020,631	95.3%	0	0.0%	$0	0.0%	328	100.0%	$628,463,030	100.0%
Andover (Twp)	2,584	$3,609,679,724	91	3.5%	$179,023,505	5.0%	263	10.2%	$740,570,967	20.5%	2,584	100.0%	$3,609,679,724	100.0%
Branchville (B)	426	$532,377,368	0	0.0%	$0	0.0%	0	0.0%	$0	0.0%	426	100.0%	$532,377,368	100.0%
Byram (Twp)	3,676	$2,746,550,446	1,643	44.7%	$728,047,473	26.5%	742	20.2%	$383,785,519	14.0%	3,676	100.0%	$2,746,550,446	100.0%
Frankford (Twp)	3,537	$3,129,888,305	0	0.0%	$0	0.0%	0	0.0%	$0	0.0%	3,537	100.0%	$3,129,888,305	100.0%
Franklin (B)	2,061	$1,921,211,856	1,997	96.9%	$1,884,969,797	98.1%	1,700	82.5%	$1,790,111,458	93.2%	2,061	100.0%	$1,921,211,856	100.0%
Fredon (Twp)	1,615	$1,372,050,934	0	0.0%	$0	0.0%	27	1.7%	$30,659,161	2.2%	1,478	91.5%	$1,230,166,866	89.7%
Green (Twp)	1,698	$1,598,635,804	799	47.1%	$861,097,973	53.9%	503	29.6%	$468,407,040	29.3%	1,559	91.8%	$1,466,080,766	91.7%
Hamburg (B)	1,594	$1,588,049,291	1,594	100.0%	$1,588,049,291	100.0%	1,425	89.4%	$1,522,084,690	95.8%	1,594	100.0%	$1,588,049,291	100.0%
Hampton (Twp)	2,763	$2,196,131,598	0	0.0%	$0	0.0%	0	0.0%	$0	0.0%	2,763	100.0%	$2,196,131,598	100.0%
Hardyston (Twp)	4,403	$3,183,033,542	2,891	65.7%	$2,104,880,498	66.1%	685	15.6%	$760,054,379	23.9%	4,403	100.0%	$3,183,033,542	100.0%
Hopatcong (B)	8,040	$2,888,571,676	2,148	26.7%	$739,629,680	25.6%	162	2.0%	$79,936,104	2.8%	8,040	100.0%	$2,888,571,676	100.0%
Lafayette (Twp)	1,462	$1,958,174,065	70	4.8%	$77,989,545	4.0%	46	3.1%	$64,839,631	3.3%	1,462	100.0%	$1,958,174,065	100.0%
Montague (Twp)	2,175	$1,459,611,020	35	1.6%	$186,920,148	12.8%	0	0.0%	$0	0.0%	2,175	100.0%	$1,459,611,020	100.0%
Newton (T)	2,679	$5,093,275,807	0	0.0%	$0	0.0%	1,627	60.7%	$2,907,448,945	57.1%	2,679	100.0%	$5,093,275,807	100.0%
Ogdensburg (B)	992	$819,879,629	953	96.1%	$803,135,745	98.0%	0	0.0%	$0	0.0%	992	100.0%	$819,879,629	100.0%
Sandyston (Twp)	1,528	$1,212,626,664	0	0.0%	$0	0.0%	0	0.0%	$0	0.0%	1,528	100.0%	$1,212,626,664	100.0%
Sparta (Twp)	8,132	$9,070,094,285	1,731	21.3%	$4,096,771,630	45.2%	786	9.7%	$3,143,814,758	34.7%	8,132	100.0%	$9,070,094,285	100.0%
Stanhope (B)	1,557	$1,051,183,581	1,454	93.4%	$1,023,418,544	97.4%	444	28.5%	$203,269,350	19.3%	1,557	100.0%	$1,051,183,581	100.0%
Stillwater (Twp)	2,493	$1,417,579,398	0	0.0%	$0	0.0%	0	0.0%	$0	0.0%	1,688	67.7%	$812,676,244	57.3%
Sussex (B)	678	$1,945,578,916	0	0.0%	$0	0.0%	0	0.0%	$0	0.0%	678	100.0%	$1,945,578,916	100.0%
Vernon (Twp)	12,039	$5,658,971,163	4,337	36.0%	$2,217,043,699	39.2%	547	4.5%	$612,142,727	10.8%	12,039	100.0%	$5,658,971,163	100.0%
Walpack (Twp)	51	$63,691,550	0	0.0%	$0	0.0%	0	0.0%	$0	0.0%	30	58.8%	$27,664,744	43.4%
Wantage (Twp)	5,510	$4,877,543,885	0	0.0%	$0	0.0%	130	2.4%	$533,499,414	10.9%	5,510	100.0%	$4,877,543,885	100.0%

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposed to Hazardous Material Release Incidents											
			Within 1 Mile of a Railroad				Within 1 Mile of a Hazardous Site				Within 50 Miles of Indian Point Energy Center			
			Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total	Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total	Number of Buildings	Percent of Total	Replacement Cost Value	Percent of Total
Sussex County (Total)	72,021	$60,022,853,539	20,025	27.8%	$17,089,998,162	28.5%	9,087	12.6%	$13,240,624,142	22.1%	70,919	98.5%	$59,107,484,471	98.5%

Source: Sussex County GIS 2020; RS Means 2020; EPA 2018; NJ Transit - 2018
Note: B – Borough; T – Town; Twp – Township; % - Percent

Table 4.3.7-5. Estimated Number of Critical Facilities Located within 1-mile of Rail Lines, Hazardous Material Facilities and 50-Miles of Indian Point Energy Center

Jurisdiction	Total Critical Facilities and Lifelines Located in Jurisdiction	Hazardous Material Release Incident - Within 1 Mile of Railroads		Hazardous Material Release Incident - Within 1 Mile of Hazardous Material Facilities		Hazardous Material Release Incident - Within 50 Miles of Indian Point Energy Center	
		Number of Critical Facilities and Lifelines	Percent of Total Critical Facilities and Lifelines	Number of Critical Facilities and Lifelines	Percent of Total Critical Facilities and Lifelines	Number Critical Facilities and Lifelines	Percent of Total Critical Facilities and Lifelines
Andover (B)	12	10	83.3%	0	0.0%	12	100.0%
Andover (Twp)	37	2	5.4%	0	0.0%	37	100.0%
Branchville (B)	4	0	0.0%	0	0.0%	4	100.0%
Byram (Twp)	37	19	51.4%	16	43.2%	37	100.0%
Frankford (Twp)	23	0	0.0%	0	0.0%	23	100.0%
Franklin (B)	10	10	100.0%	10	100.0%	10	100.0%
Fredon (Twp)	17	0	0.0%	1	5.9%	12	70.6%
Green (Twp)	21	10	47.6%	2	9.5%	20	95.2%
Hamburg (B)	19	19	100.0%	18	94.7%	19	100.0%
Hampton (Twp)	20	0	0.0%	0	0.0%	20	100.0%
Hardyston (Twp)	27	22	81.5%	9	33.3%	27	100.0%
Hopatcong (B)	22	6	27.3%	2	9.1%	22	100.0%
Lafayette (Twp)	14	0	0.0%	0	0.0%	14	100.0%
Montague (Twp)	32	0	0.0%	0	0.0%	32	100.0%
Newton (T)	39	0	0.0%	17	43.6%	39	100.0%
Ogdensburg (B)	7	7	100.0%	0	0.0%	7	100.0%
Sandyston (Twp)	28	0	0.0%	0	0.0%	28	100.0%
Sparta (Twp)	74	36	48.6%	20	27.0%	74	100.0%
Stanhope (B)	7	7	100.0%	2	28.6%	7	100.0%
Stillwater (Twp)	24	0	0.0%	0	0.0%	13	54.2%
Sussex (B)	8	0	0.0%	0	0.0%	8	100.0%
Vernon (Twp)	74	16	21.6%	9	12.2%	74	100.0%
Walpack (Twp)	11	0	0.0%	0	0.0%	3	27.3%
Wantage (Twp)	29	0	0.0%	2	6.9%	29	100.0%
Sussex County (Total)	**596**	**164**	**27.5%**	**108**	**18.1%**	**571**	**95.8%**

Source: Sussex County GIS 2020; EPA 2018; NJ Transit - 2018
Note: B – Borough; T – Town; Twp – Township

Table 4.3.7-6. Distribution of Critical Facilities by Type Built Within 1 Mile of a Railway

Jurisdiction	Facility Types																						
	Communication Facility	Dam	DPW	Electrical Substation	EMS	EOC	Fire Station	Food Pantry	Fuel	Government Building	Hazardous Material	Health/Medical Center	Police Station	Post Office	Potable Pump Station	Potable Water Treatment	Primary Education	Secondary Education	Senior Center	Shelter	Wastewater Pump	Wastewater Treatment	Well
Andover (B)	1	1	0	1	0	0	1	0	2	1	0	0	0	0	0	1	0	0	1	1	0	0	0
Andover (Twp)	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Branchville (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Byram (Twp)	0	5	0	0	0	1	1	0	0	1	2	0	1	0	0	0	2	0	0	2	4	0	0
Frankford (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Franklin (B)	0	1	0	0	1	0	1	0	0	1	2	0	1	0	0	0	2	0	0	1	0	0	0
Fredon (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green (Twp)	0	1	1	0	0	1	1	0	0	1	1	0	0	1	0	0	2	0	0	1	0	0	0
Hamburg (B)	0	2	1	1	1	0	1	0	0	2	4	0	1	0	1	0	1	0	0	1	2	0	1
Hampton (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hardyston (Twp)	0	10	1	0	2	0	1	0	0	2	1	1	1	0	0	0	2	0	0	1	0	0	0
Hopatcong (B)	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0
Lafayette (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Montague (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Newton (T)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ogdensburg (B)	0	2	0	0	1	0	1	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0
Sandyston (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sparta (Twp)	0	10	2	1	1	1	0	1	0	1	5	0	1	0	2	0	4	1	1	1	2	1	1
Stanhope (B)	0	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	2	0	0	1	0	0	0
Stillwater (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sussex (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vernon (Twp)	0	5	1	0	1	0	2	0	0	1	2	0	1	0	0	0	0	0	0	3	0	0	0
Walpack (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wantage (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sussex County (Total)	**1**	**41**	**7**	**3**	**8**	**3**	**10**	**1**	**2**	**12**	**17**	**1**	**8**	**1**	**3**	**1**	**17**	**1**	**3**	**13**	**8**	**1**	**2**

Source: Sussex County GIS 2020; NJ Transit - 2018
Note: B – Borough; T – Town; Twp – Township

Table 4.3.7-7. Distribution of Critical Facilities by Type Built Within 1 Mile of Hazardous Material Sites

Jurisdiction	Facility Types																		
	Dam	DPW	Electrical Substation	EMS	EOC	Fire Station	Food Pantry	Government Building	Hazardous Material Facility	Health/Medical Center	Police Station	Potable Pump Station	Primary Education	Secondary Education	Senior Center	Shelter	Wastewater Pump	Wastewater Treatment	Well
Andover (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Andover (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Branchville (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Byram (Twp)	2	0	0	0	1	1	0	1	2	0	1	0	2	0	0	2	4	0	0
Frankford (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Franklin (B)	1	0	0	1	0	1	0	1	2	0	1	0	2	0	0	1	0	0	0
Fredon (Twp)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green (Twp)	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Hamburg (B)	2	1	1	1	0	1	0	1	4	0	1	1	1	0	0	1	2	0	1
Hampton (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hardyston (Twp)	0	1	0	1	0	0	0	2	1	1	1	0	2	0	0	0	0	0	0
Hopatcong (B)	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lafayette (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Montague (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Newton (T)	0	0	1	1	0	1	0	2	1	1	1	1	3	0	0	1	4	0	0
Ogdensburg (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sandyston (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sparta (Twp)	1	2	1	1	1	0	1	1	5	0	1	0	1	1	1	0	2	1	0
Stanhope (B)	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Stillwater (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sussex (B)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vernon (Twp)	1	1	0	1	0	1	0	1	2	0	1	0	0	0	0	1	0	0	0
Walpack (Twp)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wantage (Twp)	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Sussex County (Total)	**9**	**6**	**3**	**6**	**2**	**5**	**1**	**9**	**21**	**2**	**7**	**2**	**13**	**1**	**1**	**6**	**12**	**1**	**1**

Source: Sussex County GIS 2020; EPA 2018 *Note: B – Borough; T – Town; Twp – Township*

Table 4.3.7-8. Distribution of Critical Facilities by Type Within 50 Miles of the Indian Point Energy Center

Jurisdiction	Facility Types																								
	Airport	Communication Facility	Correctional Facility	Dam	DPW	Electrical Substation	EMS	EOC	Fire Station	Food Pantry	Fuel	Government Building	Hazardous Material	Health/Medical Center	Police Station	Post Office	Potable Pump Station	Potable Water Treatment	Primary Education	Religious Center	Secondary Education	Senior Center	Shelter	Wastewater Pump	Wastewater Treatment	Well
Andover (B)	0	1	0	1	0	1	0	0	2	0	3	1	0	0	0	0	0	1	0	0	0	1	1	0	0	0
Andover (Twp)	1	4	0	17	2	1	1	1	3	0	0	1	0	0	1	0	0	0	2	0	0	2	1	0	0	0
Branchville (B)	0	0	0	0	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Byram (Twp)	0	2	0	14	0	0	2	2	2	0	0	1	2	0	1	0	0	0	2	0	0	0	3	6	0	0
Frankford (Twp)	0	0	0	10	2	0	1	1	3	1	0	2	0	0	1	0	0	0	1	0	0	0	1	0	0	0
Franklin (B)	0	0	0	1	0	0	1	0	1	0	0	1	2	0	1	0	0	0	2	0	0	0	1	0	0	0
Fredon (Twp)	0	0	0	9	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Green (Twp)	0	0	0	3	1	0	1	1	1	0	0	1	2	0	0	2	0	0	4	2	1	0	1	0	0	0
Hamburg (B)	0	0	0	2	1	1	1	0	1	0	0	2	4	0	1	0	1	0	1	0	0	0	1	2	0	1
Hampton (Twp)	0	0	0	13	0	0	0	0	3	0	0	1	0	0	0	0	0	0	2	0	0	1	0	0	0	0
Hardyston (Twp)	0	0	0	14	1	0	2	0	2	0	0	2	1	1	1	0	0	0	2	0	0	0	1	0	0	0
Hopatcong (B)	0	0	0	6	1	1	1	1	3	0	0	1	0	0	1	0	0	0	4	0	0	1	2	0	0	0
Lafayette (Twp)	0	0	0	3	1	0	1	0	1	0	0	3	0	0	0	0	0	0	1	0	0	0	4	0	0	0
Montague (Twp)	0	0	0	12	1	1	1	0	2	1	0	1	0	0	0	0	1	0	1	0	0	0	2	0	0	9
Newton (T)	0	1	1	2	1	1	1	0	2	2	0	9	1	4	1	0	2	0	4	0	1	1	1	4	0	0
Ogdensburg (B)	0	0	0	2	0	0	1	0	1	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0
Sandyston (Twp)	0	0	0	20	2	0	0	0	2	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0
Sparta (Twp)	0	0	0	31	3	2	1	1	3	1	0	1	5	0	1	0	6	0	9	0	1	1	1	3	1	3
Stanhope (B)	0	0	0	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	2	0	0	0	1	0	0	0
Stillwater (Twp)	0	0	0	8	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0
Sussex (B)	0	0	0	1	1	1	0	1	1	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0
Vernon (Twp)	0	0	0	52	1	0	3	0	4	0	0	1	2	0	1	0	0	0	6	0	0	0	4	0	0	0
Walpack (Twp)	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wantage (Twp)	1	1	0	14	1	0	1	1	2	0	0	1	2	0	0	0	0	1	3	0	0	0	1	0	0	0
Sussex County (Total)	**2**	**10**	**1**	**237**	**21**	**9**	**20**	**9**	**43**	**7**	**2**	**37**	**21**	**6**	**12**	**3**	**10**	**2**	**50**	**2**	**3**	**7**	28	15	1	13

Source: Sussex County GIS 2020

Note: B – Borough; T – Town; Twp – Township

Table 4.3.7-9. Number of Identified Lifelines by Category Within Hazardous Material Hazard Areas

FEMA Lifeline Category	Total Number of Lifelines in Sussex County	Number of Lifelines Within One Mile of a Railway	Number of Lifelines Within One Mile of a Hazardous Site	Number of Lifelines Within 50 Miles of Indian Point Energy Center
Communications	9	1	0	9
Energy	12	5	3	12
Food, Water, Shelter	75	28	23	74
Hazardous Materials	20	16	20	20
Health and Medical	15	5	3	15
Safety and Security	463	109	59	439
Transportation	2	0	0	2
Sussex County (Total)	**596**	**164**	**108**	**571**

Source: Sussex County GIS 2020; EPA 2018; NJ Transit – 2018; FEMA 2020

In addition to critical facilities and lifelines, the miles of roads exposed to hazardous material hazard areas are summarized in Table 4.3.6-10. Out of the 1,771 miles of transportation routes in the County, 369 miles, 203 miles, and 1,709 miles are built within 1 mile of a railway, 1 mile of hazardous material site, and 50 miles of the Indian Point Energy Center, respectively.

Table 4.3.7-10. Major Transportation Routes Located Within 1-mile of Rail Lines, Hazardous Material Facilities and 50-Miles of Indian Point Energy Center

Road Type	Total Miles for County	Roadway Miles Within One Mile of a Railway		Roadway Miles Within One Mile of a Hazardous Site		Roadway Miles Within 50 Miles of Indian Point Energy Center	
		Miles	Percent of Total	Miles	Percent of Total	Miles	Percent of Total
Local and Private Roads	1,337	275	20.6%	139	10.4%	1286	96.2%
County Roads	313	51	16.4%	38	12.2%	303	97.0%
State Routes	86	38	44.5%	25	28.5%	85	98.4%
US Highways	34	3	9.2%	2	4.6%	34	98.7%
Interstate	1	1	100.0%	0	0.0%	1	100.0%
Sussex County Total	**1,771**	**369**	**20.8%**	**203**	**11.5%**	**1,709**	**96.5%**

Source: Sussex County GIS 2020; NJDOT 2019

Impact on Economy

If a significant hazardous substances incident occurred, not only would life, safety, and building stock be at risk, but the economy of Sussex County may be impacted as well. A significant incident in an urban area may force businesses to close for an extended period of time because of contamination or direct damage caused by an

explosion, if one occurred. The exact impact on the economy is difficult to determine, given the uncertain nature of the size and scope of incidents.

Hazardous substance incidents have the potential to lead to major transportation route closures in Sussex County. The closure of waterways, railroads, airports, and highways as a result of these incidents has the potential to impact the ability to deliver goods and services efficiently. Potential impacts may be local, regional, or statewide, depending on the magnitude of the event and the level of services disruptions.

Impact on Environment

Hazardous wastes that are released into the environment can be harmful to species and their habitat (EPA 2020). Wastes that get into waterways will be disruptive and sometimes deadly to aquatic species. Consequentially, wastes that get into waterways can also contaminate drinking water supplies. Hazardous wastes can also leach into soils and travel with wind, which not only impacts the localized habitat, but can create issues for surrounding communities. Strict disposal regulations have been defined by organizations like the EPA to ensure that the environment and community is protected from these types of events.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development.
- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development

Any areas of growth could be potentially impacted by the hazardous materials hazard areas. Development near the transit routes for hazardous materials and facilities will increase the County's overall risk. Therefore, the County should take precautions with the location of new development and the development's proximity to hazardous material facilities and transit routes. The County may also want to consider implementing designs into the new development that enables improved evacuation or protection from residual impacts from the hazardous materials. Refer to Section 3 (County Profile) for more information about the County's anticipated and recent new development plans.

Projected Changes in Population

According to the 2018 5-year population estimates from the American Community Survey, the population of Sussex County (i.e., 142,298 persons) has decreased by approximately 4.7-percent since 2010. Even though the population has decreased, any changes in the density of population can impact the number of persons living near hazardous materials facilities and transit routes.

Climate Change

As temperatures change, excessive heat on containers that contain hazardous materials may alter the material properties. In addition, hazardous substances stored at fixed locations in the floodplain may experience an increase in flood events due to the project changes in increased precipitation events; magnitude and frequency

Vulnerability Changes Since the 2016 HMP

The 2021 HMP has been updated to reflect 2014-2018 American Community Survey 5-year estimates for population changes. The building stock inventory was updated using data from Sussex County. Further, the building stock inventory replacement cost values were updated using RS Means 2020 values providing an overall update to the assets assessed in this risk assessment. This HMP implemented distance buffers over three hazardous material areas, 1 mile from railways, 1 mile from hazardous material sites, and 50 miles of the Indian Point Energy Center. Overall, the County's vulnerability has not changed, and the entire County will continue to be exposed and vulnerable to hazardous substance incidents.

4.3.8 HURRICANE AND TROPICAL STORM

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the hurricane and tropical storm hazard in Sussex County.

2020 HMP CHANGES

- Previous occurrences were updated with events that occurred between 2016 and 2020.
- A vulnerability assessment was conducted for the hurricane and tropical storm hazard using a more accurate and updated building inventory.

Profile

Hazard Description

A tropical cyclone is characterized by a low-pressure center and numerous thunderstorms that produce strong winds and heavy rain. Tropical depressions, tropical storms, and hurricanes are all considered tropical cyclones. Tropical cyclones strengthen when water evaporated from the ocean is released as the saturated air rises, resulting in condensation of water vapor contained in the moist air. These storms rotate counterclockwise in the northern hemisphere around the center and are accompanied by heavy rain and strong winds (NOAA 2020a). Almost all tropical storms and hurricanes in the Atlantic basin (which includes the Gulf of Mexico and Caribbean Sea) form between June 1 and November 30 (hurricane season). August and September are peak months for hurricane development (NOAA 2020a).

Tropical cyclones are fueled by a different heat mechanism than other cyclonic windstorms such as Nor'Easters and polar lows. The characteristic that separates tropical cyclones from other cyclonic systems is that at any height in the atmosphere, the center of a tropical cyclone will be warmer than its surroundings; a phenomenon called "warm core" storm systems (NOAA n.d.).

A hurricane is a tropical storm that attains hurricane status when its wind speed reaches 74 or more miles per hour (mph). Tropical systems may develop in the Atlantic between the Lesser Antilles and the African coast, or may develop in the warm tropical waters of the Caribbean and Gulf of Mexico. These storms may move up the Atlantic Coast of the United States and impact the Eastern Seaboard, or move into the United States through the states along the Gulf Coast, bringing wind and rain as far north as New England, before moving offshore and heading east.

Location

All of Sussex County is vulnerable and at risk to flooding due to heavy rains and winds produced by hurricanes and tropical storms.

NOAA's Historical Hurricane Tracks tool is a public interactive mapping application that displays Atlantic Basin and East-Central Pacific Basin tropical cyclone data. This interactive tool catalogs tropical cyclones that have occurred from 1842 to 2020 (latest date available from data source). Between 1861 and 2020, 32 events classified as either a hurricane, tropical storm, or tropical depression tracked within 65 nautical miles of Sussex County. Figure 4.3.8-1 displays tropical cyclone tracks that tracked with 65 nautical miles of Sussex County between 2015 and 2020 (only two events – Tropical Storm Fay and Tropical Storm Isaias in 2020). Refer to the "Previous Occurrences and Losses" section for further information regarding hurricane and tropical storm events that impacted Sussex County.

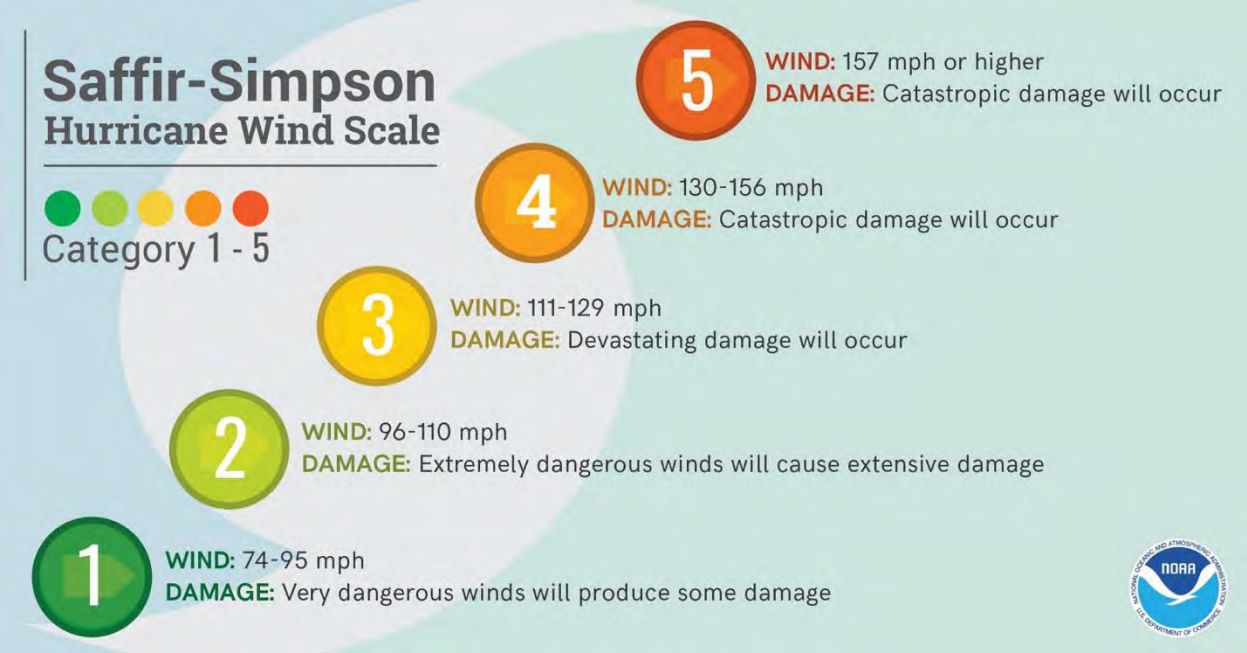
Extent

The extent of a hurricane is categorized in accordance with the Saffir-Simpson Hurricane Scale. The Saffir-Simpson Hurricane Wind Scale is a 1-to-5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous and require preventative measures (NOAA 2013b). Table 4.3.8-1 presents this scale, which is used to estimate the potential property damage and flooding expected when a hurricane makes landfall.

Figure 4.3.8-1. Historical Tropical Storm and Hurricane Tracks 2015 to 2020

Source: NOAA 2021

Figure 4.3.8-2. Saffir-Simpson Scale



Source: NWS 2020

The NWS issues hurricane and tropical storm watches and warnings. These watches and warnings are issued or will remain in effect after a tropical cyclone becomes post-tropical, when such a storm poses a significant threat to life and property. The NWS allows the National Hurricane Center (NHC) to issue advisories during the post-tropical stage. The following are the definitions of the watches and warnings:

- *Hurricane/Typhoon Warning* is issued when sustained winds of 74 mph or higher are expected somewhere within the specified area in association with a tropical, subtropical, or post-tropical cyclone. Because hurricane preparedness activities become difficult once winds reach tropical storm force, the warning is issued 36 hours in advance of the anticipated onset of tropical storm-force winds. The warning can remain in effect when dangerously high water or combination of dangerously high water and waves continue, even though winds may be less than hurricane force.
- *Hurricane Watch* is issued when sustained winds of 74 mph or higher are possible within the specified area in association with a tropical, subtropical, or post-tropical cyclone. Because hurricane preparedness activities become difficult once winds reach tropical storm force, the hurricane watch is issued 48 hours prior to the anticipated onset of tropical storm-force winds.
- *Tropical Storm Warning* is issued when sustained winds of 39 to 73 mph are expected somewhere within the specified area within 36 hours in association with a tropical, subtropical, or post-tropical storm.
- *Tropical Storm Watch* is issued when sustained winds of 39 to 73 mph are possible within the specified area within 48 hours in association with a tropical, sub-tropical, or post-tropical storm.
  (NWS 2013).

Mean Return Period

In evaluating the potential for hazard events of a given magnitude, a MRP is often used. The MRP provides an estimate of the magnitude of an event that may occur within any given year based on past recorded events. MRP is the average period of time, in years, between occurrences of a particular hazard event, equal to the inverse of the annual frequency of exceedance (Dinicola 2009).

Figure 4.3.8-3 and Figure 4.3.8-4 show the estimated maximum 3-second gust wind speeds that can be anticipated in the study area associated with the 100- and 500-year MRP events. These peak wind speed projections were generated using FEMA's Hazus-MH v4.2 wind model. The estimated hurricane track used for the 100- and 500-year event is also shown. The maximum 3-second gust wind speeds for Sussex County are 59-64 mph (Tropical Storm), for the 100-year MRP event (tropical storm). The maximum 3-second gust wind speeds for Sussex County are 75-80 mph (Category 1 hurricane) for the 500-year MRP event. The associated impacts and losses from these 100-year and 500-year MRP hurricane event model runs are discussed in the Vulnerability Assessment subsection.

Figure 4.3.8-3. Wind Speeds for the 100-Year Mean Return Period Event

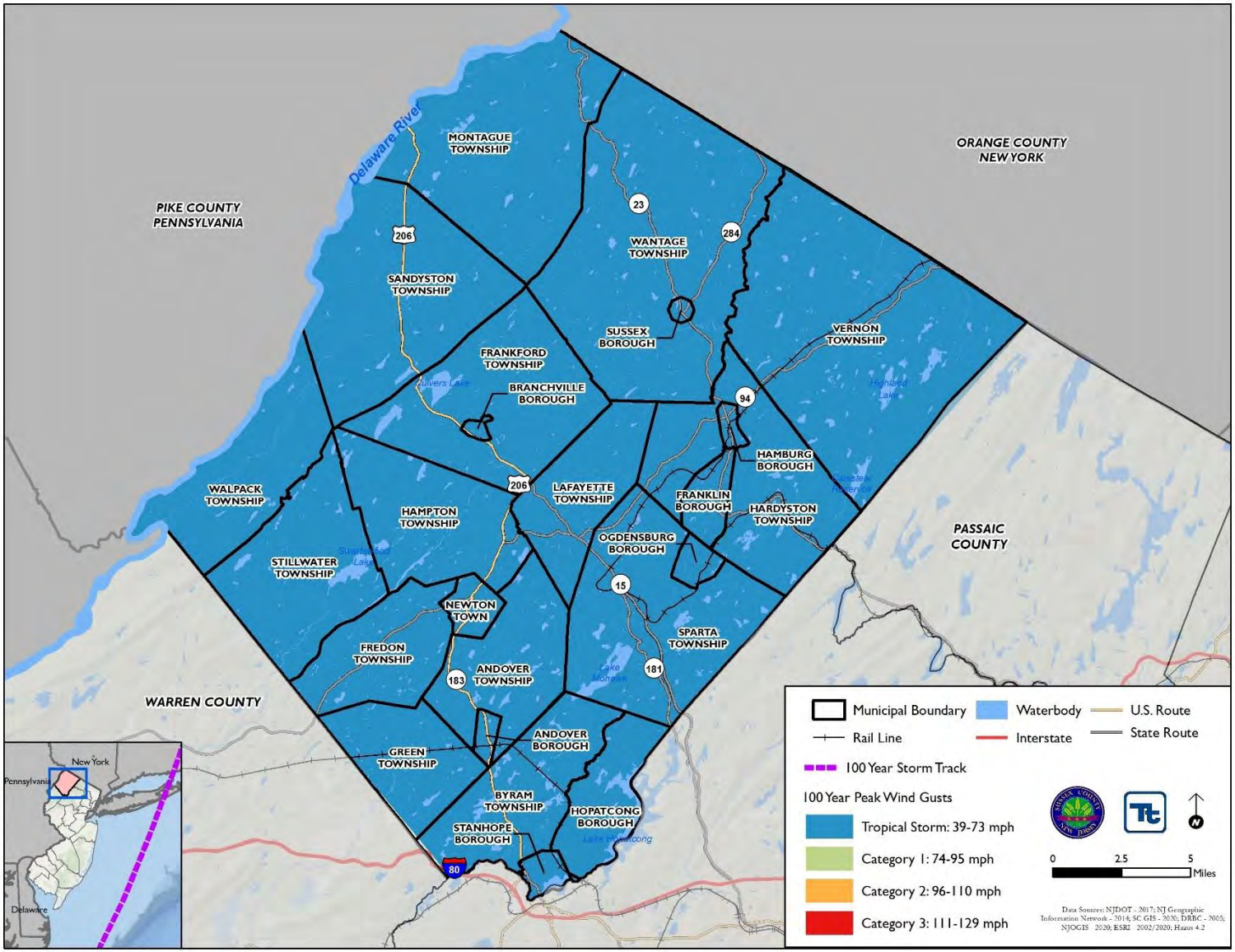
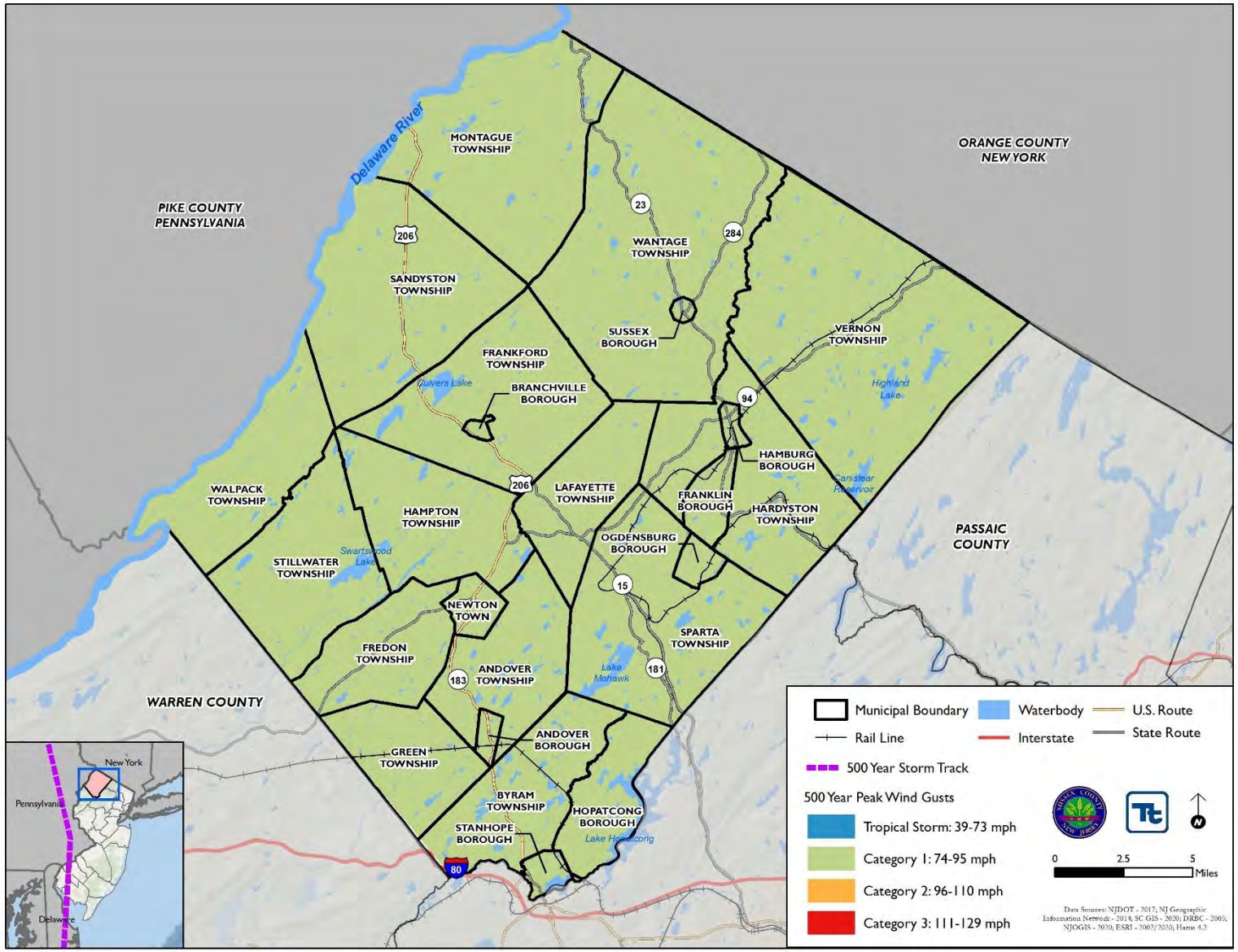


Figure 4.3.8-4. Wind Speeds for the 500-Year Mean Return Period Event



Previous Occurrences and Losses

Between 1954 and 2020, Sussex County was included in six declarations for hurricane and tropical storm-related events; refer to Table 4.3.8-1. Hurricane and tropical storm events that have impacted Sussex County between 2015 and 2020 are identified in Table 4.3.8-2 with associated impacts. The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2020, the period for which data was available, Sussex County was not included in any USDA agricultural disasters relating to hurricanes or tropical storms.

Please see Section 9 (Jurisdictional Annexes) for detailed information regarding impacts and losses to each municipality. For events prior to 2015, refer to the Appendix E (Risk Assessment Supplement).

Table 4.3.8-1. Hurricane-Related Disaster (DR) and Emergency (EM) Declarations 1954-2020

Declaration	Event Date	Declaration Date	Event Description
EM-3148	September 16-18, 1999	September 17, 1999	Hurricane Floyd Emergency Declarations
DR-1295	September 16-18, 1999	September 17, 1999	Hurricane Floyd Major Disaster Declarations
EM-3332	August 26 – September 5, 2011	August 27, 2011	Hurricane Irene
DR-4021	August 26 – September 5, 2011	August 31, 2011	Hurricane Irene
EM-3354	October 26 – November 8, 2012	October 28, 2012	Hurricane Sandy
DR-4086	October 26 – November 8, 2012	October 30, 2012	Hurricane Sandy

Source: FEMA 2020

Table 4.3.8-2. Hurricane and Tropical Storm Events in Sussex County, 2015 to 2020

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
July 10, 2020	Tropical Storm	N/A	TBD, pending	Sussex County	Tropical Storm Fay moved northward along the coasts of Delaware and New Jersey on the afternoon and evening of July 10. The storm produced rainfall totals up to 3 to 6 inches in New Jersey, with the highest totals occurring in the southern part of the state. Some areas also experienced a period of tropical storm force winds, especially near the coast. Overall impacts from wind were limited.
August 4, 2020	Tropical Storm	N/A	TBD, pending	Sussex County	Tropical Storm Isaias brought high winds, heavy rain, several tornadoes, and coastal flooding to the mid-Atlantic region, becoming the most impactful tropical cyclone to impact most of the region since Sandy in 2012.

Source: FEMA 2020; NOAA-NCEI 2020; NWS 2020; SPC 2020; NJOEM 2019

Note: Not all events that have occurred in Sussex County are included due to the extent of documentation and the fact that not all sources have been identified or researched.

K: Thousand

DR Disaster Declaration (FEMA)

FEMA Federal Emergency Management Agency

Mph miles per hour

N/A Not Applicable

Probability of Future Occurrences

Hurricane return periods are the frequency at which a certain intensity of hurricane can be expected within a given distance of a given location. For example, a return period of 20 years for a major hurricane means that on average during the previous 100 years, a Category 3 or greater hurricane passed within 58 miles of a specific location approximately 5 times. The return period of hurricanes for Sussex County was not calculated – however, the return period for surrounding counties is 18 to 19 years for a hurricane (greater than 64 mph winds) and 74 to 76 years for a major hurricane (greater than 110 mph winds) (NOAA 2013).

In order to determine the recurrence interval and the average annual number of events, data from 1950 to 2020 was looked at using NOAA's Historical Hurricane Tracks tool. A 65 nautical mile radius was used to identify any hurricane and tropical storm events Sussex County. Based on this data, 18 hurricanes, tropical storms, tropical depressions or extra-tropical storms passed within 100 nautical miles of Sussex County. The table below shows these statistics, as well as the annual average number of events and the estimated percent change of an event occurring in a given year (NHC 2021).

Table 4.3.8-3. Probability of Future Hurricane and Tropical Storm Events

Hazard Type	Number of Occurrences Between 1950 and 2020	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	Percent chance of occurrence in any given year
Tropical Depression	2	0.03	35.5	0.03	2.8
Tropical Storm	14	0.20	5.1	0.20	19.7
Hurricanes (all categories)	2	0.03	35.5	0.03	2.8
Total	**18**	**0.26**	**3.9**	**0.25**	**25.4**

Source: NHC 2021

It is estimated that Sussex County will continue to experience direct and indirect impacts of hurricane and tropical storms that may induce secondary hazards such as flooding, extreme wind, infrastructure deterioration or failure, utility failures, power outages, water quality and supply concerns, and transportation delays, accidents, and inconveniences.

In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for hurricane and tropical storms in the county is considered 'frequent' (100 percent annual probability; a hazard event may occur multiple times per year, as presented in Table 4.4-1). The ranking of the hurricane and tropical storm hazard for individual municipalities is presented in the jurisdictional annexes.

Climate Change Impacts

Providing projections of future climate change for a specific region is challenging. Shorter term projections are more closely tied to existing trends making longer term projections even more challenging. The further out a prediction reaches the more subject to changing dynamics it becomes.

Climate change includes major changes in temperature, precipitation, or wind patterns, which occur over several decades or longer. Due to the increase in greenhouse gas concentrations since the end of the 1890s, New Jersey has experienced a 3.5° F (1.9° C) increase in the State's average temperature (Office of the New Jersey State

Climatologist 2020), which is faster than the rest of the Northeast region (2° F [1.1° C]) (Melillo et al. 2014) and the world (1.5° F [0.8° C]) (IPCC 2014). This warming trend is expected to continue. By 2050, temperatures in New Jersey are expected to increase by 4.1 to 5.7° F (2.3° C to 3.2° C) (Horton et al. 2015). Thus, New Jersey can expect to experience an average annual temperature that is warmer than any to date (low emissions scenario) and future temperatures could be as much as 10° F (5.6° C) warmer (high emissions scenario) (Runkle et al. 2017). New Jersey can also expect that by the middle of the 21st century, 70% of summers will be hotter than the warmest summer experienced to date (Runkle et al. 2017).

As temperatures increase, Earth's atmosphere can hold more water vapor which leads to a greater potential for precipitation. Currently, New Jersey receives an average of 46 inches of precipitation each year (Office of the New Jersey State Climatologist 2020). Since the end of the twentieth century, New Jersey has experienced slight increases in the amount of precipitation it receives each year, and over the last 10 years there has been a 7.9% increase. By 2050, annual precipitation in New Jersey could increase by 4% to 11% (Horton et al. 2015). By the end of this century, heavy precipitation events are projected to occur two to five times more often (Walsh et al. 2014) and with more intensity (Huang et al. 2017) than in the last century. New Jersey will experience more intense rain events, less snow, and more rainfalls (Fan et al. 2014, Demaria et al. 2016, Runkle et al. 2017). Also, small decreases in the amount of precipitation may occur in the summer months, resulting in greater potential for more frequent and prolonged droughts (Trenberth 2011). New Jersey could also experience an increase in the number of flood events (Broccoli et al. 2020).

A warmer atmosphere means storms have the potential to be more intense (Guilbert et al. 2015) and occur more often (Coumou and Rahmstorf 2012, Marquardt Collow et al. 2016, Broccoli et al. 2020). In New Jersey, extreme storms typically include coastal nor'easters, snowstorms, spring and summer thunderstorms, tropical storms, and on rare occasions hurricanes. Most of these events occur in the warmer months between April and October, with nor'easters occurring between September and April. Over the last 50 years, in New Jersey, storms that resulted in extreme rain increased by 71% (Walsh et al. 2014) which is a faster rate than anywhere else in the United States (Huang et al. 2017).

Climate change may result in changes to the frequency of coastal storms. A warmer atmosphere means storms have the potential to be more intense (Guilbert et al. 2015) and occur more often (Coumou and Rahmstorf 2012, Marquardt Collow et al. 2016, Broccoli et al. 2020). In New Jersey, extreme storms typically include coastal nor'easters, snowstorms, spring and summer thunderstorms, tropical storms, and on rare occasions hurricanes. Most of these events occur in the warmer months between April and October, with nor'easters occurring between September and April. Over the last 50 years, in New Jersey, storms that resulted in extreme rain increased by 71% (Walsh et al. 2014) which is a faster rate than anywhere else in the United States (Huang et al. 2017). As temperatures increase so will the energy in a storm system, increasing the potential for more intense tropical storms (Huang et al. 2017), especially those of Category 4 and 5 (Melillo et al. 2014).

As oceans warm, the length of hurricane season may expand. The past five hurricane seasons have featured a tropical system occurring before the official start of the season. In 2016, a very rare winter hurricane named Alex developed in the middle of January (BBC 2019). According to NOAA's database, 39 storms formed in the Atlantic Basin before June 1 from 1851 through 2020, a long-term average of one such early storm every four to five years. The 2010s had the most such storms, and there has been a steady increase since the 1990s. However, the 1950s had six such storms, the 1930s had four and there was another four preseason storm streak from 1887 through 1890. It is possible there were other such storms in the era before satellites – before the mid-1960s – that were missed by ship observations or reports from areas impacted. It remains to be seen if expansion of the traditional hurricane season is a long-term trend or a common occurrence (Weather.com 2020).

Temperatures are predicted to increase in Sussex County and ocean temperatures are forecast to continue to increase, which may lead to an increase in intensity and frequency of hurricanes. It remains to be seen if other

factors such as steering currents, atmospheric sheer, and the presence of Saharan dust will be impacted in ways which increase or decrease the risk of hurricanes in Sussex County.

Vulnerability Assessment

A probabilistic assessment was conducted for the 100- and 500-year MRPs through a Level 2 analysis in HAZUS-MH v4.2 to estimate potential losses associated with high-wind events. The impacts on population, existing structures, critical facilities and the economy are presented below.

Impact on Life, Health and Safety

The impact of a hurricane or tropical storm on life, health, and safety is dependent upon several factors including the severity of the event and whether or not adequate warning time was provided to residents. For the purposes of this HMP, the entire population of Sussex County (142,298 people) is exposed to hurricanes and tropical storm events (U.S. Census, American Community Survey 5-year Population Estimates 2018). Residents might be displaced or require temporary to long-term sheltering as a result of these events. In addition, downed trees, damaged buildings, and debris carried by high winds can lead to injury or loss of life. Socially vulnerable populations are most susceptible, based on several factors including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing. Hazus estimates no households will be displaced and temporary shelter will not be required as a result of the 100 or 500-year MRP events.

Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions based on the major economic impact to their family and might lack funds to evacuate. The population over the age of 65 is also more vulnerable and might physically have more difficulty evacuating. The elderly is considered most vulnerable because they require extra time or outside assistance during evacuations and are more likely to seek or need medical attention that might not be available due to isolation during a storm event. The 2018 American Community Survey population estimates indicate there were 22,889 persons over 65 years old and 7,191 living below the poverty level in Sussex County. Section 3 (County Profile) provides statistics of these populations.

Secondary flooding associated with the torrential downpours during hurricanes/tropical storms is also a primary concern in the County (refer to the flooding discussion in Section 4.3.5 - Flood).

Impact on General Building Stock

It is assumed that the entire County's general building stock is exposed to the hurricane and tropical storm hazard ($60.0 billion). Building construction plays a major role in the extent of damage resulting from a storm event. Due to differences in construction, residential structures are generally more susceptible to wind damage than commercial and industrial structures. Wood and masonry buildings, in general, regardless of their occupancy class, tend to experience more damage than concrete or steel buildings. High-rise buildings are also very vulnerable structures. Mobile homes are the most vulnerable to damage, even if tied down, and offer little protection to people inside.

The Hazus wind model was run to estimate potential losses to buildings. Expected building damage was evaluated across the following wind damage categories: no damage/very minor damage, minor damage, moderate damage, severe damage, and total destruction; Table 4.3.8-4 summarizes the definition of the damage categories.

Table 4.3.8-4 Description of Damage Categories

Qualitative Damage Description	Roof Cover Failure	Window Door Failures	Roof Deck	Missile Impacts on Walls	Roof Structure Failure	Wall Structure Failure
No Damage or Very Minor Damage Little or no visible damage from the outside. No broken windows, or failed roof deck. Minimal loss of roof cover, with no or very limited water penetration.	≤2%	No	No	No	No	No
Minor Damage Maximum of one broken window, door or garage door. Moderate roof cover loss that can be covered to prevent additional water entering the building. Marks or dents on walls requiring painting or patching for repair.	>2% and ≤15%	One window, door, or garage door failure	No	<5 impacts	No	No
Moderate Damage Major roof cover damage, moderate window breakage. Minor roof sheathing failure. Some resulting damage to interior of building from water.	>15% and ≤50%	> one and ≤ the larger of 20% & 3	1 to 3 panels	Typically 5 to 10 impacts	No	No
Severe Damage Major window damage or roof sheathing loss. Major roof cover loss. Extensive damage to interior from water.	>50%	> the larger of 20% & 3 and ≤50%	>3 and ≤25%	Typically 10 to 20 impacts	No	No
Destruction Complete roof failure and/or, failure of wall frame. Loss of more than 50% of roof sheathing.	Typically >50%	>50%	>25%	Typically >20 impacts	Yes	Yes

Source: Hazus-MH Hurricane Technical Manual

According to the Hazus wind model, most Sussex structures would experience no damage with a small number experiencing minor damage. Table 4.3.8-5 indicates the number and type of buildings for each damage category.

Table 4.3.8-5 Expected Damages from 100 and 500-Year MRP Hurricane Wind Events

Occupancy Class	Total Number of Buildings in Occupancy	Severity of Expected Damage	100-year		500-year	
			Building Count	Percent Buildings in Occupancy Class	Building Count	Percent Buildings in Occupancy Class
Residential Exposure (Single and Multi-Family Dwellings)	62,429	None	62,419	>99.9%	61,852	>99.9%
		Minor	10	<0.1%	570	<0.1%
		Moderate	0	0.0%	7	<0.1%
		Severe	0	0.0%	0	0.0%
		Complete Destruction	0	0.0%	0	0.0%
Commercial Buildings	3,304	None	3,297	>99.9%	3,279	>99.9%
		Minor	7	<0.1%	25	<0.1%
		Moderate	0	0.0%	0	0.0%

Occupancy Class	Total Number of Buildings in Occupancy	Severity of Expected Damage	100-year		500-year	
			Building Count	Percent Buildings in Occupancy Class	Building Count	Percent Buildings in Occupancy Class
		Severe	0	0.0%	0	0.0%
		Complete Destruction	0	0.0%	0	0.0%
Industrial Buildings	258	None	257	>99.9%	255	>99.9%
		Minor	1	<0.1%	3	<0.1%
		Moderate	0	0.0%	0	0.0%
		Severe	0	0.0%	0	0.0%
		Complete Destruction	0	0.0%	0	0.0%
Government, Religion, Agricultural, and Education Buildings	6,030	None	6,027	>99.9%	6,004	>99.9%
		Minor	3	<0.1%	25	<0.1%
		Moderate	0	0.0%	1	<0.1%
		Severe	0	0.0%	0	0.0%
		Complete Destruction	0	0.0%	0	0.0%

Source: Hazus-MH v4.2

Table 4.3.8-6 and Table 4.3.8-7 summarize the replacement cost value damage estimated for the 100- and 500-year MRP wind-only events.

The total estimated damage to buildings for all occupancy types across Sussex County is estimated to be approximately $10.0 and $67.4 million for the 100- and 500-year MRP wind-only events, respectively. Most of these losses are to residential buildings. Due to differences in building construction, residential structures are generally more susceptible to wind damage than commercial and industrial structures. The damage counts include buildings damaged at all severity levels from minor damage to destruction. Total dollar damage reflects the overall impact to buildings at an aggregate level. The Township of Vernon is estimated to experience the greatest damage in a 100-year MRP event, approximately $2.1 million. The Township of Sparta is estimated to experience the greatest damage in a 500-year event, losing $9.9 million. Damages to buildings is a direct result of wind speeds, direction and duration; which is dependent upon the storm's intensity and track.

Table 4.3.8-6. Estimated Building Value Damaged by the 100 and 500-Year MRP Hurricane-Related Winds (Building Structure and Content)

Jurisdiction	Total Replacement Cost Value (All Occupancies)	Estimated Total Damages		Percent of Total Building and Contents Replacement Cost Value	
		100-Year	500-Year	100-Year	500-Year
Andover (B)	$628,463,030	$65,969	$482,051	<0.1%	0.1%
Andover (Twp)	$3,609,679,724	$402,887	$3,444,722	<0.1%	0.1%
Branchville (B)	$532,377,368	$49,511	$465,331	<0.1%	0.1%
Byram (Twp)	$2,746,550,446	$158,478	$1,713,526	<0.1%	0.1%

Jurisdiction	Total Replacement Cost Value (All Occupancies)	Estimated Total Damages		Percent of Total Building and Contents Replacement Cost Value	
		100-Year	500-Year	100-Year	500-Year
Frankford (Twp)	$3,129,888,305	$371,869	$3,658,865	<0.1%	0.1%
Franklin (B)	$1,921,211,856	$331,708	$1,932,696	<0.1%	0.1%
Fredon (Twp)	$1,372,050,934	$231,557	$2,088,224	<0.1%	0.2%
Green (Twp)	$1,598,635,804	$314,315	$2,917,436	<0.1%	0.2%
Hamburg (B)	$1,588,049,291	$274,204	$1,408,409	<0.1%	0.1%
Hampton (Twp)	$2,196,131,598	$304,221	$2,943,964	<0.1%	0.1%
Hardyston (Twp)	$3,183,033,542	$872,641	$4,516,987	<0.1%	0.1%
Hopatcong (B)	$2,888,571,676	$385,082	$3,109,993	<0.1%	0.1%
Lafayette (Twp)	$1,958,174,065	$223,659	$1,759,760	<0.1%	0.1%
Montague (Twp)	$1,459,611,020	$244,371	$1,842,918	<0.1%	0.1%
Newton (T)	$5,093,275,807	$277,957	$3,312,499	<0.1%	0.1%
Ogdensburg (B)	$819,879,629	$175,178	$1,046,811	<0.1%	0.1%
Sandyston (Twp)	$1,212,626,664	$158,825	$1,136,422	<0.1%	0.1%
Sparta (Twp)	$9,070,094,285	$1,619,592	$9,875,755	<0.1%	0.1%
Stanhope (B)	$1,051,183,581	$283,585	$1,946,102	<0.1%	0.2%
Stillwater (Twp)	$1,417,579,398	$226,775	$2,263,005	<0.1%	0.2%
Sussex (B)	$1,945,578,916	$87,646	$692,029	<0.1%	0.0%
Vernon (Twp)	$5,658,971,163	$2,106,600	$9,190,004	<0.1%	0.2%
Walpack (Twp)	$63,691,550	$5,301	$37,930	<0.1%	0.1%
Wantage (Twp)	$4,877,543,885	$781,076	$5,623,717	<0.1%	0.1%
Sussex County (Total)	**$60,022,853,539**	**$9,953,005**	**$67,409,158**	**<0.1%**	**0.1%**

Source: Hazus-MH 4.2; Sussex County GIS 2020; RS Means 2020
Notes: B – Borough; Twp. – Township; T = Town; % - Percent
**The Estimated Total Damages column represents the sum of damages for all occupancy classes (residential, commercial, industrial, agricultural, educational, religious, and government) based on replacement cost value.*

Table 4.3.8-7. Estimated Building Value of Residential, Commercial, and Other Occupancy Types Damaged by the 100-Year and 500-Year MRP Event Winds

Jurisdiction	Total Replacement Cost Value (All Occupancies)	Estimated Residential Damages		Estimated Commercial Damages		Estimated Damages for All Other Occupancies	
		100-Year MRP Event	500-Year MRP Event	100-Year MRP Event	500-Year MRP Event	100-Year MRP Event	500-Year MRP Event
Andover (B)	$628,463,030	$65,969	$455,728	$0	$22,504	$0	$3,819
Andover (Twp)	$3,609,679,724	$402,618	$3,187,863	$202	$210,672	$67	$46,187
Branchville (B)	$532,377,368	$49,511	$442,963	$0	$18,977	$0	$3,392
Byram (Twp)	$2,746,550,446	$158,207	$1,531,548	$206	$159,144	$65	$22,834
Frankford (Twp)	$3,129,888,305	$371,869	$3,544,452	$0	$96,755	$0	$17,658
Franklin (B)	$1,921,211,856	$302,956	$1,823,447	$19,117	$83,222	$9,635	$26,027
Fredon (Twp)	$1,372,050,934	$231,557	$2,039,186	$0	$10,674	$0	$38,364
Green (Twp)	$1,598,635,804	$314,315	$2,857,242	$0	$15,510	$0	$44,684
Hamburg (B)	$1,588,049,291	$246,517	$1,326,939	$15,786	$68,616	$11,901	$12,854
Hampton (Twp)	$2,196,131,598	$304,221	$2,860,242	$0	$61,615	$0	$22,107
Hardyston (Twp)	$3,183,033,542	$861,208	$4,414,884	$9,780	$81,912	$1,653	$20,191
Hopatcong (B)	$2,888,571,676	$357,459	$2,995,325	$16,750	$84,711	$10,873	$29,957
Lafayette (Twp)	$1,958,174,065	$223,505	$1,651,470	$116	$53,334	$38	$54,956
Montague (Twp)	$1,459,611,020	$244,371	$1,815,035	$0	$19,505	$0	$8,378
Newton (T)	$5,093,275,807	$277,957	$2,926,377	$0	$294,308	$0	$91,814
Ogdensburg (B)	$819,879,629	$165,127	$1,000,351	$3,533	$32,841	$6,518	$13,619
Sandyston (Twp)	$1,212,626,664	$158,825	$1,112,355	$0	$11,590	$0	$12,477
Sparta (Twp)	$9,070,094,285	$1,459,587	$9,303,493	$131,331	$486,978	$28,674	$85,284
Stanhope (B)	$1,051,183,581	$266,003	$1,893,816	$6,868	$29,462	$10,715	$22,824
Stillwater (Twp)	$1,417,579,398	$226,775	$2,244,493	$0	$13,995	$0	$4,517
Sussex (B)	$1,945,578,916	$87,646	$530,262	$0	$145,944	$0	$15,823
Vernon (Twp)	$5,658,971,163	$2,051,946	$9,109,822	$26,780	$49,910	$27,874	$30,272
Walpack (Twp)	$63,691,550	$5,301	$37,127	$0	$387	$0	$416
Wantage (Twp)	$4,877,543,885	$780,919	$5,502,893	$157	$87,011	$0	$33,813
Sussex County (Total)	**$60,022,853,539**	**$9,614,367**	**$64,607,314**	**$230,624**	**$2,139,577**	**$108,014**	**$662,267**

Source: Hazus-MH 4.2; Sussex County GIS 2020; RS Means 2020
Notes: B – Borough; Twp. – Township; T = Town; % - Percent

Impact on Critical Facilities and Lifelines

Utility infrastructure could suffer damage from high winds associated with falling tree limbs or other debris, resulting in the loss of power. Loss of service can impact residents and business operations alike. Interruptions in heating or cooling utilities can affect populations such as the young and elderly, who are particularly vulnerable to temperature-related health impacts. Loss of power can impact other public utilities, including potable water, wastewater treatment, and communications. In addition to public water services, property owners with private wells might not have access to potable water due to pump failure until power is restored. Lack of power to emergency facilities, including police, fire, EMS, and hospitals, will inhibit a community's ability to effectively respond to an event and maintain the safety of its citizens.

Overall, all critical facilities and lifelines are exposed to the wind hazard. Hazus estimates the probability that critical assets (i.e., medical facilities, fire/EMS, police, EOC, schools, and user-defined facilities such as shelters and municipal buildings) could sustain damage as a result of 100-year and 500-year MRP wind events. Additionally, Hazus estimates the loss of use for each facility in number of days. Due to the sensitive nature of this dataset, individual facility estimated loss is not provided.

No critical facilities would experience damage as the result of the 100-year MRP event. Table 4.3.8-8 summarizes the percent probability that each facility type may experience damage as a result of the 500-year MRP event.

Table 4.3.8-8. Estimated Impacts to Critical Facilities for the 500-Year Mean Return Period Winds

Facility Type	Loss of Days	Percent-Probability of Sustaining Damage			
		Minor	Moderate	Severe	Complete
EOC	0	1.0%	0.0%	0.0%	0.0%
Medical	0	0%-1.0%	0.0%	0.0%	0.0%
Police	0	1.0%	0.0%	0.0%	0.0%
Fire	0	0%-1.0%	0.0%	0.0%	0.0%
Schools	0	1.0%	0.0%	0.0%	0.0%

Source: Hazus-MH v4.2; Sussex County GIS 2020

Impact on Economy

Damage to structures from flooding and wind can be the most immediate result of hurricane and tropical storm events; however, this damage can have long-lasting impacts on the economy. When a business is closed during storm recovery, there is lost economic activity in the form of day-to-day business and wages to employees. Overall, economic impacts include the loss of business function (e.g., tourism, recreation), damage to inventory, relocation costs, wage loss and rental loss due to the repair/replacement of buildings. As evidenced by Hurricane Sandy, the State of New Jersey, including Sussex County, lost millions of dollars in wages and economic activity.

HAZUS-MH estimates the total economic loss associated with each storm scenario (direct building losses and business interruption losses). Direct building losses are the estimated costs to repair or replace the damage caused to the building. This is reported in the "Impact on General Building Stock" section discussed earlier. Business interruption losses are the losses associated with the inability to operate a business because of the wind damage sustained during the storm or the temporary living expenses for those displaced from their home because of the event. Refer to Table 4.3.8-9 which summarizes the economic losses estimated by Hazus.

Table 4.3.8-9. Estimated Economic Losses for the 100-Year and 500-Year Mean Return Period Hurricane Wind Events

Mean Return Period (MRP)	Inventory Loss	Relocation Loss	Building and Content Losses	Wages Losses	Rental Losses	Income Losses
100-year MRP	$0	$10	$9,953,000,000	$0	$0	$0
500-year MRP	$210,000	$506,040,000	$67,409,160,000	$0	$161,230,000	$0

Source: Hazus-MH v4.2; Sussex County GIS 2020; RS Means 2020

Impacts to transportation lifelines affect both short-term (e.g., evacuation activities) and long-term (e.g., day-to-day commuting and goods transport) transportation needs. Utility infrastructure (power lines, gas lines, electrical systems) could suffer damage and impacts can result in the loss of power, which can impact business operations and heating or cooling provisions to the population.

Debris management can be costly and impact the local economy. Hazus estimates the amount of debris that might be produced as result of the 100- and 500-year MRP wind events. Table 4.3.8-10 summarizes the estimated debris by municipality, which should be considered a lower-bound analysis. Because the estimated debris production does not include debris generated by flooding, this is likely a conservative estimate and could be higher if multiple impacts occur.

Table 4.3.8-10. Debris Production for 100- and 500-Year Mean Return Period Event Winds

Jurisdiction	Brick and Wood (tons)		Concrete and Steel (tons)		Tree (tons)		Eligible Tree Volume (cubic yards)	
	100-Year	500-Year	100-Year	500-Year	100-Year	500-Year	100-Year	500-Year
Andover (B)	0	18	0	0	64	257	115	458
Andover (Twp)	0	171	0	0	639	2,554	853	3,415
Branchville (B)	0	23	0	0	156	624	153	610
Byram (Twp)	0	147	0	0	1	715	6	1,293
Frankford (Twp)	0	159	0	0	993	3,970	1,162	4,650
Franklin (B)	1	106	0	0	148	589	549	2,196
Fredon (Twp)	0	103	0	0	572	2,286	500	2,000
Green (Twp)	0	133	0	0	520	2,080	513	2,054
Hamburg (B)	1	68	0	0	76	193	609	1,525
Hampton (Twp)	0	100	0	0	810	3,240	958	3,831
Hardyston (Twp)	0	161	0	0	1,036	4,145	1,202	4,808
Hopatcong (B)	8	265	0	0	1	298	2	770
Lafayette (Twp)	0	112	0	0	570	2,280	401	1,604
Montague (Twp)	0	53	0	0	1,472	4,416	938	2,815
Newton (T)	0	237	0	0	117	569	567	2,819
Ogdensburg (B)	0	44	0	0	73	299	276	1,110
Sandyston (Twp)	0	35	0	0	2,081	6,244	1,015	3,044
Sparta (Twp)	14	480	0	0	828	3,717	1,909	8,122
Stanhope (B)	0	64	0	0	70	349	358	1,789
Stillwater (Twp)	0	55	0	0	916	3,662	997	3,989
Sussex (B)	0	65	0	0	22	108	148	737
Vernon (Twp)	0	277	0	0	1,514	5,320	2,740	9,736

Jurisdiction	Brick and Wood (tons)		Concrete and Steel (tons)		Tree (tons)		Eligible Tree Volume (cubic yards)	
	100-Year	500-Year	100-Year	500-Year	100-Year	500-Year	100-Year	500-Year
Walpack (Twp)	0	1	0	0	69	208	34	102
Wantage (Twp)	0	240	0	0	2,158	7,552	1,774	6,379
Sussex County (Total)	**24**	**3,120**	**0**	**0**	**14,906**	**55,675**	**17,779**	**69,856**

Source: Hazus-MH 4.2; Sussex County GIS 2020
Notes: B – Borough; T – Town; Twp. – Township; % - Percent

Impact on the Environment

The impacts of hurricane related winds on the environment typically take place over a larger area. Where these events occur, widespread, severe damage to tree and plant species is likely. This includes uprooting or destruction of trees and an increased threat of wildfire in areas where dead trees are not removed. Section 4.3.5 (Flood) provides additional environmental impacts due to flooding from heavy rainfalls.

Future Changes that May Impact Vulnerability

Understanding future changes that effect vulnerability in the County can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

Understanding future changes that impact vulnerability in the Sussex County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. It is anticipated that any new development and new residents will be exposed to the hurricane and tropical storm hazard. However, due to increased standards and codes, new development might be less vulnerable to wind-related hazards compared to the aging building stock.

Projected Changes in Population

Sussex County has experienced a population decline since 2010. According to the U.S. Census Bureau, the County's population has decreased 4.7-percent between 2010 and 2018 (U.S. Census Bureau 2020). The Township of Walpack and the Borough of Sussex have experienced the greatest decline with a decrease of 62.5-percent and 13.0-percent, respectively. The population is expected to continue to decrease as residents move away from the suburbs and towards urban centers (Stirling 2018).

Even though the population has decreased over the past decade, any changes in the density of population can impact the number of persons exposed to hurricanes and tropical storms. As the population changes, so will the number of people impacted by this hazard.

Climate Change

As discussed above, most studies project that the State of New Jersey will see an increase in average annual temperatures and precipitation. An increase in temperatures may also lead to an increase in the frequency and intensity of coastal storms. More frequent and severe storms will increase the County's vulnerability to both wind-related and heavy rain impacts.

The northeast region of the United States has experienced a greater increase in extreme precipitation than any other region in the U.S. between 1958 and 2010, the Northeast experienced more than 70% increase in the amount of precipitation falling in rain events (Global Change 2014). Refer to Section 4.3.5 (Flood) for a discussion related to the impact of climate change due to increases in rainfall. An increase in storms will produce more wind events and may increase tornado activity. With an increased likelihood of strong winds and tornado events, all the County's assets will experience additional risk for losses as a result of extreme wind events.

Vulnerability Changes Since the 2016 HMP

Since the 2016 analysis, population statistics have been updated using the 2014-2018 American Community Survey. The Hazus wind analysis was performed in Hazus-MH v4.2 for Sussex County and was based on the most current and best available data, including building and critical facility inventories. The general building stock was also updated using RS Means 2020 building valuations that estimated replacement cost value for each building in the inventory. This provides an up-to-date look at the entire building stock for Sussex County and gives more accurate results for the exposure and loss estimation analysis.

4.3.9 Infestations and Invasive Species

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the infestation and invasive species hazard in Sussex County.

2021 HMP Changes

- This is a new hazard of concern for Sussex County.

Profile

Hazard Description

An infestation is defined as a state of being invaded or overrun by parasites that attack plants, animals and humans. Insect, fungi and parasitic infestations can result in destruction of various natural habitats and cropland, impact human health, and cause disease and death among native plant, wildlife and livestock. An infestation is the presence of a large number of pest organisms in an area or field, on the surface of a host, or in soil. They result from when an area is inhabited or overrun by these pest organisms, in numbers or quantities large enough to be harmful, threatening or obnoxious to native plants, animals and humans. Pests are any organism (insects, mammals, birds, parasite/pathogen, fungi, non-native species) that are a threat to other living species in its surrounding environment. Pests compete for natural resources or they can transmit diseases to humans, crops and livestock. Human populations are generally impacted by insect or animal infestations that can result in health impacts and can lead to potential epidemics or endemics. For more information on health impacts caused by infestations, refer to Section 4.3.2 (Disease Outbreak).

For the purpose of this HMP update, the infestation and invasive species hazard profile will include the following: Hemlock Woolly Adelgid, mosquitos, Emerald Ash Borer, Spotted Lanternfly, White and harmful algal bloom.

Hemlock Woolly Adelgid

Source: NJDA 2020

The Hemlock Woolly Adelgid, a tiny aphid-like insect from Asia, was first discovered in the Pacific Northwest in the 1920's. By the early 1950's it was discovered in Virginia and has since been found as far north as Rhode Island. Its preferred host tree is hemlock, but it may also attack spruce. A tree infested with Hemlock Woolly Adelgid will exhibit gray-green needles and cotton-like wool tufts under the needles. By frequently inspecting trees for signs of Hemlock Woolly Adelgid, a homeowner can intervene in a timely manner and possibly prevent the tree from dying (NJ DEP 2020).

Mosquitoes

Mosquito infestations can result in the spread of disease such as West Nile Virus, Eastern Equine Encephalitis (EEE), and Zika virus through bites from infested mosquitoes. Mosquitos typically lay eggs in or near standing water. For more information on infectious disease spread by mosquitoes, refer to 4.3.2 (Disease Outbreak).

Emerald Ash Borer

Source: NJDA 2020

Emerald Ash Borer (EAB) was first discovered in Somerset County in 2014 and has spread through the northern half of the state. This Asian beetle infests and kills North American ash tree species, including green, white, black and blue ash; making all native ash trees susceptible to this insect. The insect is typically present from late May through early September and is most common in June and July. Signs of infection include tree canopy dieback and yellowing and browning of leaves. Most trees die within two to four years of becoming infested (NJDA 2020).

Spotted Lanternfly

Source: NJAES 2020

The spotted lanternfly (*Lycorma deliculta*) is an Asian plant hopper. The adults are quite colorful with a black head, grayish black spotted forewings, and reddish black spotted hind wings. Adults are approximately 1" in length and a 1/2" in width and are present from mid-July through the fall. During this time, SLF adults are mating and laying eggs. Egg masses are laid on smooth surfaces and appear like a patch of mud.

In the USA, spotted lanternfly is an invasive species that could be very devastating to some New Jersey crops and hardwood trees. This insect was accidentally introduced into Pennsylvania and was confirmed in September 2014. In 2018, spotted lanternfly populations were found in New Jersey and a state quarantine encompassing Mercer, Hunterdon, and Warren counties has been established by the NJ Department of Agriculture (New Jersey Agricultural Experiment Station [NJAES] 2020).

The spotted lanternfly can feed on more than 70 plant species including cultivated grapes, fruit trees, and hardwood trees. One tree of particular importance is *Ailanthus altissima* or the Tree of Heaven which is abundant in New Jersey. Tree of Heaven typically grows in clumps in sunny areas along highways or disturbed habitats such as the edges of crop fields, open spaces, or parks. Other key tree hosts include black walnut; red maple; and agricultural crops such as grapes, hops, apples, and peaches.

As with all plant hoppers, the spotted lanternfly has sucking mouthparts that it inserts into plant tissues to remove the fluids it needs to survive. Adults and nymphs are phloem feeders that feed in large congregations on woody tissue. Although there are no numbers or estimates on the economic impact of the spotted lanternfly—because this insect feeds in large numbers it can quickly cause damage. Feeding occurs on the trunk and limbs of plants, not on the fruit or leaf tissues. During feeding, the insect excretes significant amounts of honey dew (or sugar water). Honey dew deposits provide a food source for a sooty mold fungus that can grow on plant surfaces and fruit leading to reduced photosynthesis and plant vigor, leading to additional plant damage (NJAES 2020).

White-Tailed Deer

White-Tailed Deer can be found from southern Canada to South America. In summer months, they typically live in fields and meadows and during the winter, the deer generally keep to forests. White-tailed deer are herbivores and graze on most types of plants. There are not many natural predators to white-tailed deer which causes the

deer population to grow too large for their environment and some areas may experience an overpopulation of deer (National Geographic 2015).

White-tailed deer are a major component throughout the State, with the exception of the most urbanized areas, affecting forests, farms, gardens, backyards and roadways. They can have negative impacts on humans, including car accidents, depredation of agricultural and ornamental plantings, and the potential for harboring diseases that are transmissible to man or domestic animals. The size of the deer population in New Jersey is managed through controlled sport hunting, with the main goal being to maintain healthy deer populations at a density tolerable to residents. In Sussex County, the white-tailed deer population have a history of impacting agriculture in the County.

Canada Geese

One of the most widely distributed waterfowl species in the United States is the Canada goose (*Branta canadensis*). After near extinction, the species bounced back to numbers far exceeding historic estimates, due to regulatory actions, habitat restoration, species conservation initiatives, and increased man-made habitat such as mowed lawns, golf courses, and stormwater detention basins. Two classes of Canada geese exist in the U.S. Migratory Canada geese (considered the Atlantic population) are those that breed north of the continental U.S., in Alaska, Canada, Newfoundland, and Labrador. These birds spend the nonbreeding season in the U.S. and northern Mexico and are present typically between October and February. Resident Canada geese are those that spend the entire year within the continental U.S. Considered a nuisance by some and a culturally important species by others, resident geese significantly affect both human and ecosystem health (Rutgers 2013).

Harmful Algal Bloom

A harmful algal bloom (HAB) is an algal bloom that can be dangerous to people, animals or the ecology. HABs can occur in both the freshwater and marine water environments. There is no scientifically sound treatment to eliminate HABs from water bodies, so advanced and continuous monitoring is the key element in protecting health and assessing when the lake is safe for swimming and recreational activities (NJDEP 2020).

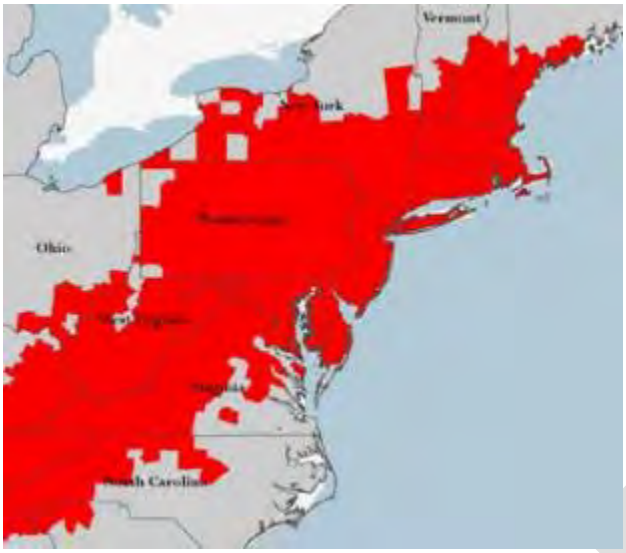
Location

Due to the diversity of landscape in Sussex County, the entire County has the potential to be impacted by each of the species identified above. Bodies of water, including Lake Hopatcong have the potential to be impacted by HABs.

Hemlock Woolly Adelgid

Hemlock Woolly Adelgid are found throughout New Jersey and many areas throughout the northeast and Appalachian Mountain.

Figure 4.3.9-1. Hemlock Woolly Adelgid Distribution in the Eastern United States

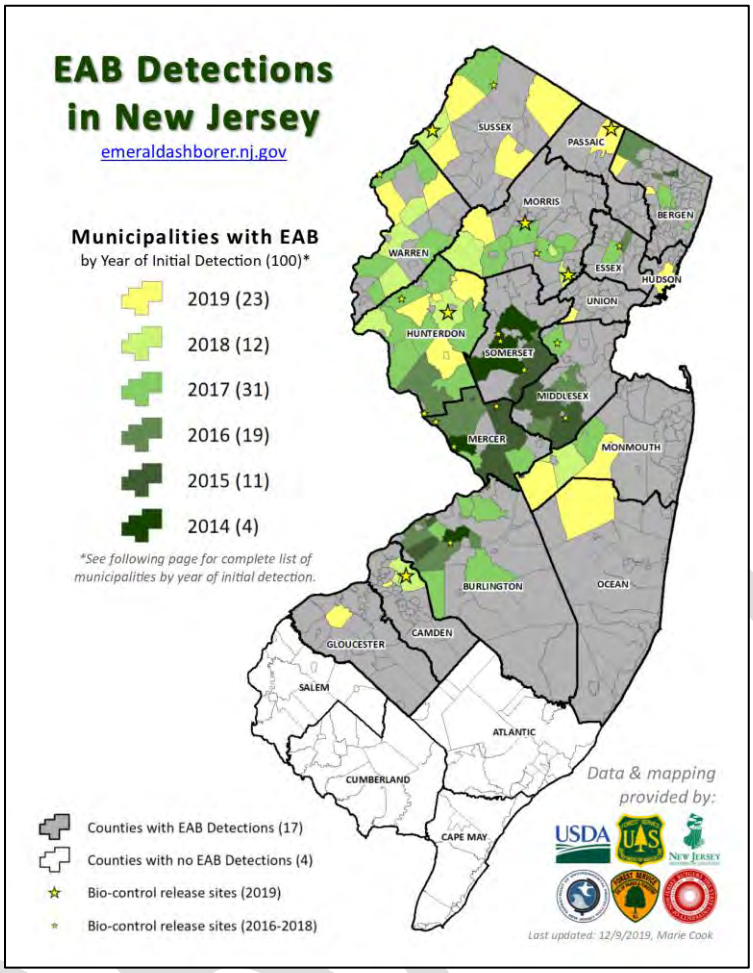


Source: USDA 2019

Emerald Ash Borer

Three species of ash are native to Sussex County an all are susceptible to EAB: white ash *(F. Americana),* green ash *(T. pennsylvanica*), and black ash (*F. nigra*). EAB was first detected in New Jersey in 2014. The New Jersey Department of Agriculture (NJDA) is coordinating New Jersey's EAB biocontrol program. Municipalities in Sussex County that have had EAB populations detected include the Township of Montague, the Township of Walpack, the Township of Sparta, the Township of Vernon, the Township of Stillwater, and the Township of Sandyston (NJDA 2020).

Figure 4.3.9-2. Emerald Ash Borer Detections in New Jersey

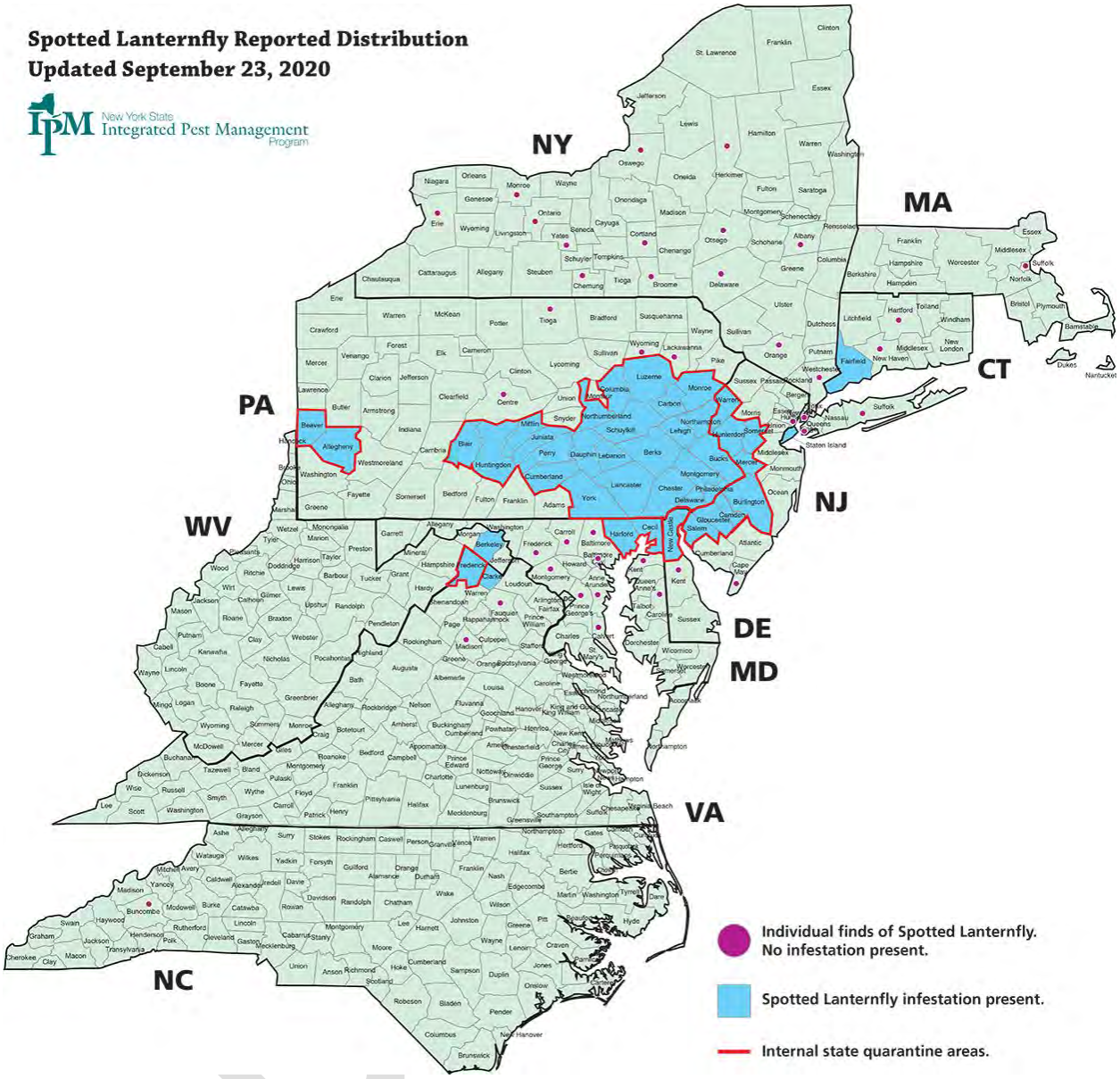


Source: State of New Jersey Department of Agriculture 2020

Spotted Lanternfly

According to NYS Integrated Pest Management (IPM), there is no spotted lanternfly infestation present in Sussex County as of September 2020; however, spotted lanternflies have been identified within the County during the fall of 2020. Refer to Figure 4.3.9-3 which displays a map of the distribution reported in the Northeast.

Figure 4.3.9-3. Spotted Lanternfly Reported Distribution as of September 2020



Source: NYS IPM 2020

White-Tailed Deer and Canada Geese

White-Tailed Deer and Canada Geese are found throughout Sussex County and New Jersey. Canada Geese are most commonly found near water bodies. White-Tailed Deer are most commonly found on the edge of wooded areas.

Harmful Algal Bloom

HABs have the potential to impact waterbodies throughout Sussex County and New Jersey.

Extent

The extent and location of infestations and invasive species depends on the preferred habitat of the species, as well as the species' ease of movement and establishment. However, each of these threats can impact many areas of Sussex County. The magnitude of infestations and invasive species ranges from nuisance to widespread. The threat is typically intensified when the ecosystem or host species is already stressed, such as periods of drought. The already weakened state of the ecosystem causes it to more easily be impacted to an infestation.

Hemlock Woolly Adelgid

The Hemlock Woolly Adelgid nymphs and adults feed on sap from the tree's twigs. The tree drops its needles and, if left uncontrolled, the adelgid can kill a tree within a year. Treatment involves manual removal of infected tree branches or spraying of horticultural oils (NJ DEP 2020).

Mosquitoes

The extent of mosquito-borne viruses is described in Section 4.3.2 (Disease Outbreak). Disease impacts can result in flu-like symptoms, brain damage, or death.

Emerald Ash Borer

The NJ Emerald Ash Borer Task Force and other experts predict a 99% mortality rate for untreated ash trees. Peak die off of trees is likely to occur 9 to 10 years after the initial infestation. This suggests that Sussex County will be dealing with large volumes of tree deaths in the next 15 years. Management options for EAB include tree removal, treating with insecticides, and biological controls (the release of wasps which act as parasitoids for egg and larvae). The United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (USDA, APHIS, PPQ), operates the biological control production facility in Michigan which was designed to produce EAB parasitoids for release. In order to be considered for inclusion in the parasitoid release program, release sites must meet a certain criteria to be eligible: the site must be forested at least 40 acres in size; the site must contain no less than 25 percent ash of varying age classes; ash trees must be relatively healthy; and EAB must be detected in close proximity to the release site and be in low to moderate densities (NJDA 2020).

Spotted Lanternfly

Spotted Lantern Fly damages plants through the extraction of plant sap. Infestations of Spotted Lanternfly can result in decimation of crops, forest habitat, and landscaping (NJDA 2020).

White-Tailed Deer

White-Tailed Deer can have negative impacts on humans, including vehicle collisions, depredation of agricultural and ornamental plantings, and the potential for harboring parasites which can transmit diseases to man or domestic animals. Deer are selective browsers, and over time, herds can eat some plants out of existence and reduce the populations of other plants. Because tree seedlings are especially vulnerable to hungry deer, the future species composition of forests can be determined by deer browsing. While trees eventually grow out of a deer's reach, many other plants never do. Because deer browsing can significantly change habitat composition, it also exerts a strong influence on other animal populations (NJ DEP 2019).

Canada Geese

Canada geese are carriers of several bacteria and parasites that may be pathogenic to humans. The bacterium most commonly associated with Canada goose droppings is the fecal coliform, *Escherichia coli* (*E. coli*). High

levels of *E. coli* can result in closure of recreational waterways. Canada geese can be a threat to aircraft and can result in air strikes. Aggressive behavior of nests and protection of goslings can result in attacks on humans and pets in areas commonly used for recreational purposes. Canada goose damage in agricultural systems can be severe (Rutgers 2013).

Harmful Algal Bloom

Some, but not all, HABs produce chemicals that can be toxic to humans and animals if ingested, inhaled, or if contacted by skin or mucous membranes. These toxins can also accumulate in fish and shellfish which can cause illness when either are consumed (NJDEP 2020). NJDEP now has an algal bloom sampling dashboard (HAB Interactive Map Reporting and Communication System) available online with samples categorized in accordance with alert levels as displayed in Figure 4.3.9-4.

Figure 4.3.9-4. HAB Alert Levels

HAB Not Present	HAB reported and investigated. No HAB present.	None
WATCH *Suspected or confirmed HAB with potential for allergenic or irritative health effects*	Suspected HAB based on field survey **OR** Confirmed cell counts ≥20K - <80K cells/mL **AND** No known toxins above public health thresholds	**Public Bathing Beaches Open** Waterbody Accessible: Use caution during **primary contact (e.g. swimming) and secondary (e.g. non-contact boating)** activities Do not ingest water (people/pets/livestock) Do not consume fish
ADVISORY *Confirmed HAB with moderate risk of adverse health effects and increased potential for toxins above public health thresholds*	Lab testing for toxins Microcystins: ≥3 µg/L Cylindrospermopsin: ≥8 µg/L Anatoxin-a: ≥27 µg/L **OR** Confirmed cell counts ≥80K cells/mL	**Public Bathing Beaches Closed** Waterbody Remains Accessible: Avoid primary contact recreation Use caution for secondary contact recreation Do not ingest water (people/pets/livestock) Do not consume fish
WARNING *Confirmed HAB with high risk of adverse health effects due to high toxin levels*	Toxin (microcystins) ≥20 - <2000 µg/L	**Public Bathing Beaches Closed** Cautions as above May recommend against secondary contact recreation.
DANGER *Confirmed HAB with very high risk of adverse health effects due to very high toxin levels*	Toxin (microcystins) ≥2000 µg/L	**Public Bathing Beaches Closed** Cautions as above. Possible closure of all or portions of waterbody and possible restrictions access to shoreline.

Source: NJDEP 2021

Previous Occurrences and Losses

Infestation and Invasive Species events that have impacted Sussex County between 2015 and 2020 are discussed below. Please see Section 9 (Jurisdictional Annexes) for detailed information regarding impacts and losses to each municipality.

Hemlock Woolly Adelgid is now common throughout the state. Emerald Ash Borer was first identified in Sussex County in 2017 and has continued to impact additional municipalities in the last several years. Many species of mosquitos are native to Sussex County but additional species such as the Asian Tiger Mosquito have been

introduced or expanded their range into the state and Sussex County in recent decades. Spotted Lanternflies have recently entered Sussex County as of fall 2020.

White-tailed Deer and Canada Geese overpopulation continue to impact agriculture throughout Sussex County.

In 2019, recreational use of Lake Hopatcong was severely limited due to harmful algal blooms. Freeholder boards in Sussex and Sussex counties have agreed to allocate a total of $50,000 in matching funds to support an application by the Lake Hopatcong Commission for a potential $500,000 state grant to study and reduce harmful algal blooms (HABs) (Sussex County 2020). New algal blooms took place in 2020 (Northjersey.com 2020). In 2020, Lake Neepaulin and Swartswood Lake were placed under HAB watches (NJDEP 2020).

According to the NJDEP HAB Interactive Map Reporting and Communication System, samples were collected and categorized on the 'watch' alert level in the fall 2020 for Lake Hopatcong, Lake Owassa, Lake Neepaulin and Lake Musconetcong (NJDEP 2021).

FEMA Major Disasters and Emergency Declarations

Between 1954 and 2020, Sussex County was included in one emergency declaration related to infestation or invasive species for West Nile Virus. For more information regarding the impacts of West Nile Virus, refer the Section 5.4.13 (Disease Outbreak).

Table 4.3.9-1. Infestation or Invasive Species-Related Disaster (DR) and Emergency (EM) Declarations 1954-2020

Declaration	Event Date	Declaration Date	Event Description
EM-3156	May 30 -November 1, 2000	November 1, 2000	West Nile Virus Threat

Source: FEMA 2020

U.S. Department of Agriculture Disaster Declarations

The Secretary of Agriculture from the USDA is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2020, Sussex County was not included in any infestation or invasive species related agricultural disaster declarations.

Probability of Future Occurrences

Based on historical documentation, increased incidences of infestation throughout the State of New Jersey and the overall impact of changing climate trends, it is estimated that Sussex County and all its jurisdictions will continue to experience infestation events that may induce secondary hazards and health threats to the County population if infestations are not prevented, controlled or eradicated effectively.

In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for infestation and invasive species in the county is considered 'frequent' (100 percent annual probability; a hazard event may occur multiple times per year, as presented in Table 4.4-1). The ranking of the infestation and invasive species hazard for individual municipalities is presented in the jurisdictional annexes.

Climate Change Impacts

Providing projections of future climate change for a specific region is challenging. Shorter term projections are more closely tied to existing trends making longer term projections even more challenging. The further out a prediction reaches the more subject to changing dynamics it becomes.

Climate change includes major changes in temperature, precipitation, or wind patterns, which occur over several decades or longer. Due to the increase in greenhouse gas concentrations since the end of the 1890s, New Jersey has experienced a 3.5° F (1.9° C) increase in the State's average temperature (Office of the New Jersey State Climatologist 2020), which is faster than the rest of the Northeast region (2° F [1.1° C]) (Melillo et al. 2014) and the world (1.5° F [0.8° C]) (IPCC 2014). This warming trend is expected to continue. By 2050, temperatures in New Jersey are expected to increase by 4.1 to 5.7° F (2.3° C to 3.2° C) (Horton et al. 2015). Thus, New Jersey can expect to experience an average annual temperature that is warmer than any to date (low emissions scenario) and future temperatures could be as much as 10° F (5.6° C) warmer (high emissions scenario) (Runkle et al. 2017). New Jersey can also expect that by the middle of the 21st century, 70% of summers will be hotter than the warmest summer experienced to date (Runkle et al. 2017). The increase in temperatures is expected to be felt more during the winter months (December, January, and February), resulting in less intense cold waves, fewer sub-freezing days, and less snow accumulation. Changes in winter temperatures could result in a change in the frequency of ice jam events.

As temperatures increase, Earth's atmosphere can hold more water vapor which leads to a greater potential for precipitation. Currently, New Jersey receives an average of 46 inches of precipitation each year (Office of the New Jersey State Climatologist 2020). Since the end of the twentieth century, New Jersey has experienced slight increases in the amount of precipitation it receives each year, and over the last 10 years there has been a 7.9% increase. By 2050, annual precipitation in New Jersey could increase by 4% to 11% (Horton et al. 2015). By the end of this century, heavy precipitation events are projected to occur two to five times more often (Walsh et al. 2014) and with more intensity (Huang et al. 2017) than in the last century. New Jersey will experience more intense rain events, less snow, and more rainfalls (Fan et al. 2014, Demaria et al. 2016, Runkle et al. 2017). Also, small decreases in the amount of precipitation may occur in the summer months, resulting in greater potential for more frequent and prolonged droughts (Trenberth 2011). New Jersey could also experience an increase in the number of flood events (Broccoli et al. 2020).

The following provides information on the different infestations impacted Sussex County and how they may be affected by climate change.

Hemlock Woolly Adelgid, Emerald Ash Borer, Mosquitoes, and Spotted Lanternfly

A warmer climate would extend the active insect season and allow for species that are not as cold tolerant to move north and expand their range. This increases the extent of invasive insects and their related impacts.

Harmful Algal Bloom

The projected increase in precipitation is expected to occur via heavy downpours and less in the form of light rains. Rising air temperatures intensify the water cycle by increasing evaporation and precipitation, which can cause an increase in rain totals during storm events, with longer dry periods between those events. Alternating periods of drought and heavy rainfall increase the likelihood of nutrient runoff into waterways, which can fuel algal blooms (EPA 2017a).

Warmer temperatures could lead to an increase of the length of the algal growing season and increase the likelihood of algal blooms. In addition to warmer temperatures and heavy precipitation events, carbon dioxide

levels are forecast to continue to increase. Higher levels of carbon dioxide in the atmosphere and water can lead to increased algal growth, particularly for cyanobacteria that float at the surface (EPA 2017a).

White-Tailed Deer and Canada Geese

White-Tailed Deer and Canada Geese are cosmopolitan species and are found in a wide variety of climates. As such, neither species is likely to be significantly impacted by climate change.

Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed and vulnerable. All of the County is considered exposed to infestations and invasive species, with waterbodies potentially vulnerable to the harmful algal bloom hazard of concern. The following text evaluates Sussex County's vulnerability in a qualitative nature.

Impact on Life, Health and Safety

The entire population of Sussex County is vulnerable to infestations, invasive species, and harmful algal blooms. According to the 2018 American Community Survey (ACS) 5-year Estimate, Sussex County had a population of 142,298. Of that total population, the elderly population and people with suppressed immune systems are most susceptible to the effects of infestations such as West Nile Virus. The ACS has identified that there are 22,889 persons over the age of 65 in Sussex County.

As discussed earlier, infestations can have an impact on agricultural commodities. The NJDA has indicated that New Jersey farmers lose $290 million annually in direct crop loss or damage caused by agricultural pests (New Jersey Department of Agriculture n.d.). This destruction of crop may include consumable resources that are sold to persons in the County. Section 4.3.2 (Drought) discusses the number of farms that are operating in the County (i.e., 1,008 farms). Based on the Department of Agriculture's study, it is reasonable to assume that the farms in Sussex County also experience losses in crops. This not only impacts the livelihood of the farmers; it also affects the community that relies on these crops for food or other commodities.

Additionally, the impacts of harmful algal blooms on life, health, and safety depend on several factors, including the severity of the event and whether citizens and tourists have become exposed to waters suspected of containing toxins associated with cyanobacteria. Routes of exposure include consumption, inhalation, and dermal exposure. The population living near or visiting waterbodies is at risk for exposure as well as those that use those waterbodies for recreation, fishing, and water supply. Contact with water containing harmful algal blooms can cause various health effects including diarrhea, nausea or vomiting; skin, eye, or throat irritation; and allergic reactions or breathing difficulties (CDC 2020).

Further, the population living near waterbodies is at risk for exposure to HABs as well as those that use those waterbodies for recreation, fishing, and water supply. Therefore, exposure should not be limited to only those who reside in a defined hazard zone, but visitors to Sussex County waterbodies as well. Contact with water containing HABs can cause various health effects including diarrhea, nausea or vomiting; skin, eye, or throat irritation; and allergic reactions or breathing difficulties (NJDEP 2020).

Cyanobacteria blooms are one of the most common freshwater HABs and have been identified by NJDEP as being present in Sussex County blooms. Cyanobacteria are known to produce toxins from the following classes:

Endotoxins: Endotoxins associated with cyanobacteria have been tied to fever and inflammation in humans that have come in contact with water that contains cyanobacterial blooms.

Hepatotoxins: Hepatotoxins are commonly tied to animal poisonings that are associated with cyanobacterial blooms. Animals may exhibit weakness, heavy breathing, paleness, cold extremities, vomiting, diarrhea, and bleeding in the liver. In humans, hepatotoxins have been indicated to promote tumors and may lead to increases in liver cancer. Some types of hepatotoxins, such as microcystin, can persist in fresh water for up to 2 weeks before being naturally broken down (algae).

Neurotoxins: Neurotoxins act to block transfers between neurons. Extreme cases can result in paralysis (EPA 2014).

The EPA has established an incident checklist for HAB incidents impacting water utilities (EPA 2017). This tool is available to help utilities detect, identify, and monitor a bloom. The County is recommended to coordinate with the supplier to ensure that the water is clear of harmful algae, thus maintaining the safety of users of the purchased water.

Impact on General Building Stock

Structures are not anticipated to be directly affected by infestation, invasive species, or harmful algal blooms. However, the EAB may cause a catastrophic loss of ash trees throughout the County, which could result in stream bank instability, erosion, and increased sedimentation, impacting ground stabilization and possibly cause foundation issues for nearby structures. Additionally, with an increased number of dead trees, there is an increased risk of trees falling on roadways, power lines, and buildings.

Some invasive plants have been shown to destabilize soil due to high densities and shallow root systems, negatively impacting nearby buildings and septic systems. Other invasive plant species have been known to clog culverts and streams, increasing flooding risk.

Impact on Critical Facilities and Lifelines

Water treatment plants could be impacted by infestation and invasive species because of similar issues that the general building stock may experience. Water that becomes polluted due to increased sedimentation and erosion will require additional treatment. If the system becomes clogged with these pollutants, the ability of water treatment plants to operate may become impaired. Additionally, soil that becomes unstable due to decaying vegetation can impact critical facilities that are built on or around these soils.

The typical impact harmful algal blooms have on critical facilities are shutdowns of water intakes from the surface waters that are impacted by blooms and their toxins. Water treatment plants can remove variable amounts of microcystin from drinking water depending on the active removal process used by the water treatment plant (EPA 2020). However, applying the wrong treatment process at a specific state in treatment could damage the facility and release cyanotoxins rather than remove them. The EPA has summarized the effectiveness of treatment options for harmful algal blooms (refer to Table 4.3.9-2).

Table 4.3.9-2. Assessment of Treatment Options for HABs

Treatment Process	Relative Effectiveness
Intracellular Cyanotoxins Removal (Intact Cells)	
Pre-treatment oxidation	Oxidation often stresses or lyses cyanobacteria cells releasing the cyanotoxin to the water. If oxidation is required to meet other treatment objectives, consider using lower doses of an oxidant less likely to lyse cells. If oxidation at higher doses must be used, sufficiently high doses should be used to not only lyse cells but also destroy total toxins present (see extracellular cyanotoxin removal).
Coagulation/ Sedimentation/ Filtration	Effective for the removal of intracellular toxins (cyanobacteria cells). Ensure that captured cells accumulated in sludge are removed frequently to release toxins. Ensure that sludge supernatant is not returned to the supply after sludge separation.
Membranes	Effective for removal of intracellular cyanotoxins (cyanobacteria cells). Microfiltration and ultrafiltration are effective when cells are not allowed to accumulate on membranes for long periods of time. More frequent cleaning may be required during a bloom event.
Flotation	Flotation processes, such as Dissolved Air Flotation (DAF), are effective for removal of intracellular cyanotoxins since many of the toxin-forming cyanobacteria are buoyant.
Extracellular (Dissolved) Cyanotoxins Removal	

Treatment Process	Relative Effectiveness
Membranes	Depends on the type of cyanotoxin, membrane material, membrane pore size distribution, and influent water quality. Nanofiltration is generally effective in removing extracellular microcystins. Reverse osmosis filtration is generally applicable for removal of microcystins and cylindrospermopsin. Cell lysis is highly likely. Further research is needed to characterize performance.
Potassium Permanganate	Effective for oxidizing microcystins and anatoxins. Further research is needed for cylindrospermopsin. Not effective for oxidizing saxitoxin.
Ozone	Very effective for oxidizing microcystins, anatoxin-a, and cylindrospermopsin. Not effective for oxidizing saxitoxin.
Chloramines	Not effective.
Chlorine dioxide	Not effective at doses typically used in drinking water treatment.
Free Chlorine	Effective for oxidizing microcystins as long as the pH is below 8. Effective for oxidizing cylindrospermopsin and saxitoxin. Not effective for oxidizing anatoxin-a.
UV Radiation	UV radiation alone is not effective at oxidizing microcystins and cylindrospermopsin at doses typically used in drinking water treatment. When UV radiation is coupled with ozone or hydrogen peroxide (called "advanced oxidation"), the process is effective at oxidizing anatoxin-a, cylindrospermopsin, and with high UV doses, microcystins.
Activated Carbon Adsorption	Powdered activated carbon (PAC): Effectiveness of PAC adsorption varies based on type of carbon, pore size, type of cyanotoxin, and other water quality parameters such as natural organic matter (NOM) concentration. Wood-based activated carbons are generally the most effective at microcystins adsorption. More research is needed to evaluate PAC's effectiveness at adsorbing cylindrospermopsin, anatoxin-a, and saxitoxin, however the limited research has demonstrated promising results. Doses in excess of 20mg/L may be needed for complete toxin removal, especially if NOM concentrations are high. Granular activated carbon (GAC): Effectiveness of GAC adsorption varies based on type of carbon, pore size, type of cyanotoxin, and other water quality parameters such as NOM concentration. GAC is effective for microcystins, and likely effective for cylindrospermopsin, anatoxin-a and saxitoxin. The condition of the carbon is an important factor in determining GAC's effectiveness for cyanotoxin removal. GAC may need to be regenerated more frequently to ensure adequate adsorption capacity for HAB season.

Source: EPA 2020

Impact on Economy

Impacts of infestation, invasive species, and harmful algal blooms on the economy and estimated dollar losses are difficult to measure and quantify. Costs associated with activities and programs implemented to conduct surveillance and address invasive species and infestations have not been quantified in available documentation. However, as indicated by the NJDA, farmers across the State may collectively revenue because of crop losses from invasive species and infestations (New Jersey Department of Agriculture n.d.). In 2017, there were 25,671 acres of cropland in Sussex County, and 20,441 acres that was harvested (USDA 2017). Revenues for Sussex County from crop sales and livestock stocks sales were approximately $10.8 million and $7.4 million, respectively. Therefore, it is reasonable to believe that Sussex County farmers have experienced monetary losses from infestations.

The New Jersey Forest Service has indicated that 9-percent of New Jersey forests are susceptible to EAB attacks (NJDEP 2016). EAB can infect nursery stock and mature trees, which could reduce the timber value of hardwood exports (CFIA 2014). In 2010, the USDA Northern Research Station conducted computer simulations of EAB spread to estimate the cost of ash tree treatment, removal, and replacement (re-planting of new trees) between 2009 and 2019. The simulations predicted an EAB infestation covering 25 states, and assumed

treatment, removal, and replacement of more than 17 million ash trees on developed land within established communities. The total costs were estimated at $10.7 billion. This figure doubled when the model was reset to include developed land outside, as well as inside, human communities (USDA 2013).

HAB-related economic impacts on Sussex County would largely focus on the agricultural and recreation sector. News of a closure of a body of water can result in visitors avoiding the area. Even after closures are lifted, negative public reaction can persist and continue to impact local revenue and property values. As mentioned, there is a price tied to programs that protect water bodies from harmful algal blooms. The cost to operate and monitor these programs will vary depending on the extent of the blooms. Additional costs may include money spent on nutrient reduction programs for agricultural commodities, purchasing backup water sources, and costs to implement advanced drinking water treatment. Agricultural producers may need to develop better strategies to reduce the nutrient runoff that cause harmful algal blooms, which may increase production costs for their commodities and overall costs for their buyers.

Impact on the Environment

As previously discussed, Sussex County's parks, forests and neighborhood trees are vulnerable to mosquitos, spotted lanternfly, Canadian geese, and EAB. Species that cause eventual destabilization of soil, such as invasive insects that destroy plants or invasive plants that outcompete native vegetation but have less effective root systems, can increase runoff into waterbodies. This can lead to increased harmful algal blooms and negative impact on drinking water supplies. Soil destabilization can also increase the likelihood of mudslides in areas with a steep slope.

The New Jersey Forest Service has indicated that EAB will first infest the top of the tree's crown. This leads to the crown dying, bark splitting, and exit holes are created on lower parts of the tree. Trees that are infested only live on average of 3 to 4 years (NJDEP 2016).

Furthermore, harmful algal blooms can release toxins that can kill fish and invertebrate (EPA 2019). Animals that prey on fish and invertebrates in surface waters, such as birds and mammals, may be affected if they ingest impacted prey. Both harmful and non-harmful algal blooms can have drastic impacts on oxygen levels in surface waters. When algae begin to die off following a bloom, bacteria begin to decompose the organic material. This decomposition consumes dissolved oxygen and releases carbon dioxide. If the bloom and die off is large enough, dissolved oxygen levels in aquatic systems can rapidly crash. Anoxic conditions connected to algal blooms have resulted in large fish and invertebrate kills.

Future Changes that May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development.
- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development

As discussed in Sections 3 (County Profile) and 9 (Jurisdictional Annexes), areas targeted for future growth and development have been identified across Sussex County. Changes in land use have the potential to render some habitats more susceptible to invasive species, such as clearing the land and providing opportunities for invasive species to inhabit the area. Clearing the land may also reduce the habitat for predator species that could manage

the spread of invasive species naturally. As increased development is often associated with stormwater and runoff issues, harmful algal blooms may become more likely in areas of increased development. The specific areas of development are indicated in tabular form and/or on the hazard maps included in the jurisdictional annexes in Volume II, Section 9 of this plan.

Projected Changes in Population

According to the 2018 5-year population estimates from the American Community Survey, the population of Sussex County (i.e., 142,298 persons) has decreased by approximately 4.7-percent since 2010. Even though the population has decreased, any changes in the density of population nearby waterbodies can impact the number of persons exposed to harmful algal blooms. During summer months, there is an increase in visitors to the County's lakes and shorelines which can increase exposure to harmful algal blooms.

Infestation to cropland and nurseries can also have an impact on persons outside of Sussex County if the farmers within the County supply resources to neighboring communities. Being aware of trends occurring around the County may reveal that infestations within agricultural commodities provided by the County impacts a greater number of persons.

Climate Change

Climate is defined not simply as average temperature and precipitation but also by the type, frequency, and intensity of weather events. Changing weather patterns could create a change in the migration patterns for when these species move into and out of Sussex County. If the species have a more prolonged existence in the County, there may also be a greater number of infestation events or a higher value of loss tied to infestation. Warmer temperatures could lead to an increase of the length of the algal growing season and increase the likelihood of algal blooms. Increased alternation of drought and heavy precipitation could result in additional nutrient runoff into local waterbodies, providing more fuel for algal blooms. Higher carbon dioxide levels in the atmosphere and surface waters could create a more favorable growing environment for HABs (EPA 2019).

Vulnerability Change Since the 2016 HMP

Harmful algal blooms, infestations, and invasive species are a new hazard of concern for Sussex County.

4.3.10 NOR'EASTER

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the Nor'Easter hazard in Sussex County.

2021 HMP UPDATE CHANGES

- Previous occurrences were updated with events that occurred between 2015 and 2021.
- An updated qualitative vulnerability assessment was conducted.

Profile

Hazard Description

A Nor'Easter is a cyclonic storm that moves along the East Coast of North America. It is called a Nor'Easter because the damaging winds over coastal areas blow from a northeasterly direction. Nor'Easters can occur any time of the year, but are most frequent and strongest between September and April. These storms usually develop between Georgia and New Jersey within 100 miles of the coastline and typically move from southwest to northeast along the Atlantic Coast of the United States (NOAA 2013). A Nor'Easter event can cause storm surges, waves, heavy rain, heavy snow, wind, and coastal flooding. Nor'Easters have diameters that can span 1,200 miles, impacting large areas of coastline. The forward speed of a Nor'Easter is usually much slower than a hurricane, so with the slower speed, a Nor'Easter can linger for days and cause tremendous damage to those areas impacted.

In order to be called a Nor'Easter, a storm must have the following conditions, as per the Northeast Regional Climate Center (NRCC):

- Must persist for at least a 12-hour period
- Have a closed circulation
- Be located within the quadrilateral bounded at 45°N by 65°W and 70°W and at 30°N by 85°W and 75°W
- Show general movement from the south-southwest to the north-northeast
- Contain wind speeds greater than 23 miles per hour (mph)

A Nor'Easter event can cause storm surges, waves, heavy rain, heavy snow, wind, and coastal flooding. Nor'Easters have diameters that can span 1,200 miles, impacting large areas of coastline. The forward speed of a Nor'Easter is usually much slower than a hurricane, so with the slower speed, a Nor'Easter can linger for days and cause tremendous damage to those areas impacted. Approximately 20 to 40 Nor'Easters occur in the northeastern United States every year, with at least two considered severe (Storm Solution, 2014). New Jersey can be impacted by 10 to 20 Nor'Easters each year, with approximately five to 10 of those having significant impact on the State. The intensity of a Nor'Easter can rival that of a tropical cyclone in that, on occasion, it may flow or stall off the mid-Atlantic coast resulting in prolonged episodes of precipitation, coastal flooding, and high winds.

For the purpose of this HMP, only Nor'Easter events are being further discussed within this hazard profile, due to their significant historical impact on Sussex County. For information flooding related to Nor'Easters, refer to Section 4.3.5 (Flood) and Section 4.3.8 (Hurricane). For information on severe winter storms, refer to Section 4.3.12.

Location

The entire State of New Jersey, including Sussex County, is susceptible to the effects of Nor'Easters; however, coastal communities and other low-lying areas are particularly vulnerable. Nor'Easters usually form off the east coast near the Carolina, and then follow a track northwards along the coast until they blow out to sea. Although Sussex County is bordered to the west by the Delaware River which is considered a coastal boundary in New Jersey, it is well upriver of areas that would experience coastal flooding. The County is exposed to the direct and indirect impacts of a Nor'Easter including rain, snow, and wind.

Extent

The magnitude or severity of a severe winter storm or Nor'Easter depends on several factors including a region's climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, and time of occurrence during the day (e.g., weekday versus weekend), and time of season.

The extent of a severe winter storm can be classified by meteorological measurements and by evaluating its societal impacts. NOAA's National Climatic Data Center (NCDC) is currently producing the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two-thirds of the United States. The RSI ranks snowstorm impacts on a scale from 1 to 5. It is based on the spatial extent of the storm, the amount of snowfall, and the interaction of the extent and snowfall totals with population (based on the 2000 Census). The NCDC has analyzed and assigned RSI values to over 500 storms since 1900 (NOAA-NCDC 2011). Table 4.3.10-1 presents the five RSI ranking categories.

Table 4.3.10-1. RSI Ranking Categories

Category	Description	RSI Value
1	Notable	1-3
2	Significant	3-6
3	Major	6-10
4	Crippling	10-18
5	Extreme	18.0+

Source: NOAA-NCDC 2011
Note: RSI = Regional Snowfall Index

Previous Occurrences and Losses

FEMA Major Disasters and Emergency Declarations

Between 1954 and 2020, FEMA included the State of New Jersey in seven Nor'Easter-related major disaster (DR) or emergency (EM) declarations classified as one or a combination of the following disaster types: severe storm, high tides, flooding, coastal storm, coastal flooding, or tropical depression. Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. Sussex County has been included in two Nor'Easter-related declarations. Table 4.3.10-2 lists FEMA DR and EM declarations for Sussex County.

Table 4.3.10-2. FEMA Declarations for Nor'Easter Events in Sussex County

FEMA Declaration Number	Date(s) of Event	Date Declared	Event Type
DR-1694	April 14-20, 2007	April 26, 2007	Severe Storms and Inland and Coastal Flooding

FEMA Declaration Number	Date(s) of Event	Date Declared	Event Type
DR-4048	October 29, 2011	November 30, 2011	Severe Storm

Source: FEMA 2020; NJ HMP 2019

For this plan update, known Nor'Easter events that have impacted Sussex County between 2015 and 2021 are identified in Table 4.3.10-3. Events identified in the 2016 HMP are included in Appendix E (Risk Assessment Supplement). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).

Table 4.3.10-3. Nor'Easter Events in Sussex County, 2015 to 2020

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
January 22-24, 2016	Winter Storm	DR-4264	No	Sussex County	An impulse from the west coast traversed the midsection of the country, then developed into a low pressure system as it tracked across the Gulf states before intensifying along the Carolina coast into a major nor'easter, producing record snowfall in parts of New Jersey on January 23rd. It then moved out to sea after passing by the mid-Atlantic coast early on January 24th. Snow began falling during the Friday afternoon commute on January 22nd, then continued, heavy at times, Friday night into early Sunday morning. Wind gusts up to 60 MPH produced blizzard conditions as visibilities dropped to one-quarter mile or less in spots. Representative snowfall totals include 16.0 inches in Stockholm (Sussex).
January 24, 2017	Heavy Rain, Nor'Easter	N/A	N/A	Sussex County	Just over 2 inches of rain fell in association with the Nor'easter.
March 14, 2017	Blizzard	N/A	N/A	Sussex County	Low pressure systems across the Ohio Valley and Carolinas phased. This led to a rapidly developing storm which tracked just offshore. Wind and a foot of snow were reported across Sussex County.
March 2, 2018	Winter Storm	N/A	N/A	Sussex County	A heavy, wet snow accumulated to a depth of over 16 inches in the higher elevations of the county, and around 6 inches or so in the valleys. Some snowfall totals include 16.5 inches in Branchville, 14.0 inches in Highland Lakes, 13.5 inches at High Point, 8 inches near Wantage, 7.0 inches in Stockholm, and 2.3 inches near Sussex. A wind gust of 48 MPH was reported at High Point Monument at 1125EST on the 2nd. Blowing and drifting snow made travel hazardous Friday afternoon and evening. Numerous power outages, some lasting over two weeks, were widespread throughout the county due to tree and wire damage. Warming centers were established around the county for affected residents.
March 7, 2018	Winter Storm	DR-4368	No	Sussex County	Narrative A broad area of low pressure extending from the Ohio Valley to the Piedmont of South Carolina consolidated off the Virginia Capes during the early morning of March 7th. This new primary low moved northeast and gradually deepened as it passed east of the Delaware and New Jersey coasts on March 7th. The snow contained large amounts of liquid, making it heavy and wet. This resulted in downed trees, limbs, and wires, leading to numerous power outages across portions of New Jersey, especially where the heaviest snow was reported. Many customers were still without power from the previous

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					storm when this storm struck. Governor Murphy estimated about 350,000 customers state-wide lost power as a result of this second storm. Although all portions of the county experienced significant snowfall from this event, the higher amounts occurred over the central and eastern portions of the county which were closer to the low pressure system. Some reported snowfall totals include: 21.0 inches in Highland Lakes, 17.0 inches in Stockholm, 16.0 inches in Sparta, 15.5 inches in Hardyston Township, 15.0 inches in Vernon, 13.5 inches in Wantage, 12.7 inches in Montague, and 12.0 inches in Newton.
March 21-22, 2018	Winter Storm	N/A	N/A	Sussex County	A complex area of low pressure over the middle Atlantic, which involved several individual centers, slowly consolidated off the Virginia Capes Tuesday morning, March 20th into Wednesday March 21st along a frontal boundary. This primary low, the fourth nor'easter of March, gradually moved northeast Wednesday night, to a position southeast of the 40 North/70 West Benchmark coordinates on Thursday morning. Precipitation began as a wet, heavy snow during the evening hours on March 20th. After a lull during the overnight hours, a drier snow began falling, heavy at times, during the afternoon and evening hours on March 21st. The heaviest snow from this event fell in the southern one-half of the county, with a sharp drop off in the far north. Some snowfall reports include: 10.0 inches in both Stockholm and Byram Township, 9.5 inches in Fredon, 8.5 inches in both Hardyston Township and Newton, 7.0 inches in Ogdensburg, 7.0 inches in Andover, Sparta, and Franklin, 2.5 inches in Vernon Valley, 1.3 inches in Sussex, 1.1 inches in Wantage, and 0.2 inches in Montague.
March 3-4, 2019	Winter Storm	N/A	N/A	Sussex County	An offshore low pressure system brought a period of heavy precipitation to the mid-Atlantic. A mix of rain, sleet, and snow was observed, with snow confined mainly to interior areas and sleet and rain more abundant near the coast. Snowfall totals inland approached 10, with snowfall rates exceeding one inch per hour for several hours. A sharp gradient in snowfall with a steep drop in snow totals was observed just west of the Interstate 95 corridor. A trained spotter in Highland Lakes reported 8.2 inches of snow.

Source: NOAA NCEI 2020, NJ HMP 2019, SHELDUS

Probability of Future Occurrences

Sussex County will continue to experience the direct and indirect impacts of Nor'Easters. Secondary hazards may include flooding, extreme wind, erosion, infrastructure deterioration or failure, utility failures, power outages, water quality and supply concerns, and transportation delays, accidents, and inconveniences.

As with any weather phenomenon, it is nearly impossible to assign probabilities to Nor'Easters, except over the long-term. High activity seasons are when storm activity exceeds the historical 75th percentile. This means that seasons with this number of storms are expected to occur during one out of four years. Lower activity seasons are defined as when storm activity falls below the historical 75th percentile; meaning this number of storms are expected to occur during three out of four years (East Coast Winter Storms 2013).

In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for nor'easter in the county is considered 'frequent' (100 percent annual probability; a hazard event may occur multiple times per year, as presented in Table 4.4-1). The ranking of the nor'easter hazard for individual municipalities is presented in the jurisdictional annexes.

Climate Change Impacts

Due to the increase in greenhouse gas concentrations since the end of the 1890s, New Jersey has experienced a 3.5° F (1.9° C) increase in the State's average temperature (Office of the New Jersey State Climatologist 2020), which is faster than the rest of the Northeast region (2° F [1.1° C]) (Melillo et al. 2014) and the world (1.5° F [0.8° C]) (IPCC 2014). This warming trend is expected to continue. By 2050, temperatures in New Jersey are expected to increase by 4.1 to 5.7° F (2.3° C to 3.2° C) (Horton et al. 2015).

Since the end of the twentieth century, New Jersey has experienced slight increases in the amount of precipitation it receives each year, and over the last 10 years there has been a 7.9% increase. By 2050, annual precipitation in New Jersey could increase by 4% to 11% (Horton et al. 2015). By the end of this century, heavy precipitation events are projected to occur two to five times more often (Walsh et al. 2014) and with more intensity (Huang et al. 2017) than in the last century. New Jersey will experience more intense rain events, less snow, and more rainfalls (Fan et al. 2014, Demaria et al. 2016, Runkle et al. 2017).

Climate change may result in changes to the frequency of coastal storms. A warmer atmosphere means storms have the potential to be more intense (Guilbert et al. 2015) and occur more often (Coumou and Rahmstorf 2012, Marquardt Collow et al. 2016, Broccoli et al. 2020). In New Jersey, extreme storms typically include coastal nor'easters, snowstorms, spring and summer thunderstorms, tropical storms, and on rare occasions hurricanes. Most of these events occur in the warmer months between April and October, with nor'easters occurring between September and April. Over the last 50 years, in New Jersey, storms that resulted in extreme rain increased by 71% (Walsh et al. 2014) which is a faster rate than anywhere else in the United States (Huang et al. 2017).

Some climatologists believe that climate change may play a role in the frequency and intensity of Nor'Easters. Two ingredients are needed to produce strong Nor'Easters and intense snowfall: (1) temperatures which are just below freezing, and (2) massive moisture coming from the Gulf of Mexico. When temperatures are far below freezing, snow is less likely. As temperatures increase in the winter months, they will be closer to freezing rather than frigidly cold. Climate change is expected to produce more moisture, thus increasing the likelihood that these two ingredients (temperatures just below freezing and intense moisture) will cause more intense snow events.

Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable to the identified hazard. For the Nor'Easter hazard, all of Sussex County has been identified as potentially exposed or vulnerable. Therefore, all assets in the County (population, structures, critical facilities and lifelines), as described in Section 3, are vulnerable to a Nor'Easter.

Impact on Life, Health and Safety

The impact of a Nor'Easter on life, health and safety is dependent upon several factors including the severity of the event and whether or not adequate warning time was provided to residents. Typically, a Nor'Easter has a longer duration (potentially lasting days) than a hurricane or tropical storm event, which normally pass through an area in a matter of hours. It is assumed that the entire County's population (i.e., 142,298 total persons, American Community Survey 2018) could be exposed to this hazard (wind and rain/snow) and secondary impacts discussed earlier associated with a Nor'Easter. Further, residents may be displaced or require temporary to long-term sheltering. Refer to Section 4.3.10 (Hurricanes and Tropical Storms) which displays the peak gust wind speeds of the 100- and 500-year mean return period probabilistic wind events modeled in Hazus v4.2.

Impact on General Building Stock

The entire County's building stock is exposed to the wind and/or rain/snow from the Nor'Easter hazard. Sussex County is estimated to have 72,021 buildings, with a replacement cost value (structure and content) of approximately $60.0 billion. Refer to Section 4.3.5 (Flood), Section 4.3.8 (Hurricane and Tropical Storms), Section 4.3.11 (Severe Weather), and Section 4.3.12 (Severe Winter Weather) for more information about the wind, rain, and snow hazard impacts to the building stock in Sussex County.

Impact on Critical Facilities and Lifelines

All of Sussex County's critical facilities are exposed to the wind and/or rain/snow from the Nor'Easter hazard. Sussex County is estimated to have 596 critical facilities, all of which are considered lifelines. Refer to Section 4.3.5 (Flood), Section 4.3.8 (Hurricane and Tropical Storm), Section 4.3.11 (Severe Weather), and Section 4.3.12 (Severe Winter Weather) for more information about the wind, rain, and snow hazard impacts to the critical facilities in Sussex County.

Impact on the Economy

Nor'Easter events can greatly impact the economy, including loss of business function, damage to inventory (utility outages), relocation costs, wage loss, and rental loss due to the repair/replacement of buildings. Damages to buildings can impact a community's economy and tax base. In addition, damages to buildings and critical infrastructure, as well as road closures, can delay emergency response services during these events. Refer to Section 4.3.5 (Flood), Section 4.3.8 (Hurricane), Section 4.3.11 (Severe Weather), and Section 4.3.12 (Severe Winter Weather) for more information about the wind, rain, and snow hazard impacts to the economy in Sussex County.

Future Changes That May Impact Vulnerability

Understanding future changes that affect vulnerability can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. Several factors are examined in this section to assess hazard vulnerability.

Projected Development

As discussed and illustrated in Section 3 (County Profile), areas targeted for future growth and development have been identified across the County. Any areas of growth could be potentially impacted by a Nor'Easter event if structures do not consider current mitigation measures against flooding, rain, wind, and snow. Therefore, it is the intention of the County and all participating municipalities to discourage development in vulnerable areas or to encourage higher regulatory standards at the local level.

Projected Changes in Population

According to the 2018 5-year population estimates from the American Community Survey, the population of Sussex County (i.e., 142,298 persons) has decreased by approximately 4.7-percent since 2010. Even though the population has decreased, any changes in the density of population can impact the number of persons exposed to Nor'Easter events. Refer to Section 3 (County Profile) for more information about population trends in the County.

Climate Change

Climate is defined not simply as average temperature and precipitation but also by the type, frequency and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the prevalence and severity of events like hurricanes. While predicting changes to the prevalence or intensity of Nor'Easter events and their affects under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society and the environment (EPA 2020).

Change of Vulnerability Since the 2016 HMP

Overall, the County's vulnerability has not changed; the entire County continues to be exposed and potentially vulnerable to the Nor'Easter hazard. Hazards that relate to Nor'Easter events (i.e., flood, hurricane, severe weather, and severe winter weather) use an updated building stock and critical facility data to assess the County's risk to flood, wind, rain, and snow. The building inventory was updated using RS Means 2020 values, which is more current and reflects replacement cost versus the building stock improvement values reported in the 2016 HMP. Further, the 2018 5-year population estimates from the ACS were used to evaluate the population exposed to the flood, hurricane, severe weather, and severe winter weather hazards of concern.

4.3.11 SEVERE WEATHER

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the severe weather hazard in Sussex County.

2021 HMP Changes

- All subsections have been updated using best available data.
- Previous occurrences were updated with events that occurred between 2015 and 2020.
- The vulnerability assessment was conducted using updated population, building and critical facility/lifeline spatial data to estimate potential losses from the wind hazard using the FEMA Hazus-MH hurricane model. These wind-related results are discussed in greater detail in Section 4.3.8 (Hurricane and Tropical storm).

Profile

Hazard Description

For the purpose of this HMP update and as deemed appropriated by the Sussex County Planning Committee, the severe weather hazard includes high winds, tornadoes, thunderstorms and lightning, extreme temperatures, and hail, which are defined below.

Thunderstorms

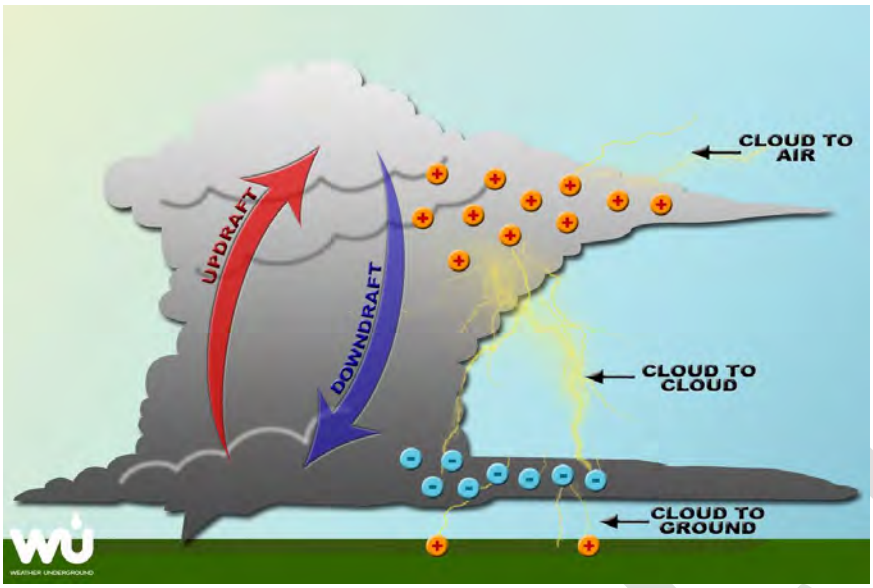
A thunderstorm is a local storm produced by a cumulonimbus cloud and accompanied by lightning and thunder (National Weather Service [NWS] 2009). A thunderstorm forms from a combination of moisture; rapidly rising warm air; and a force capable of lifting air, such as a warm front, cold front, a sea breeze, or a mountain. Thunderstorms form from the equator to as far north as Alaska. Although thunderstorms generally affect a small area when they occur, they have the potential to become dangerous due to their ability to generate tornadoes, hailstorms, strong winds, flash flooding, and lightning.

Thunderstorms can lead to heavy rain induced flooding, landslides, strong winds, and lightning. Roads may become impassable from flooding, downed trees or power lines, or a landslide. Downed power lines can lead to loss of utility services, such as water, phone, and electricity. Typical thunderstorms are 15 miles in diameter and last an average of 30 minutes. During the summer, thunderstorms are responsible for most of the rainfall.

Lightning

Lighting is a bright flash of electrical energy produced by a thunderstorm. The resulting clap of thunder is the result of a shock wave created by the rapid heating and cooling of the air in the lightning channel. All thunderstorms produce lightning and are very dangerous. Lightning ranks as one of the top weather killers in the United States, killing approximately 50 people and injuring hundreds each year. Lightning can occur anywhere there is a thunderstorm. Lightning can be cloud to air, cloud to cloud, and cloud to ground. Figure 5.4.8-1 demonstrates the variety of lightning types.

Figure 4.3.11-1. Types of Lightning

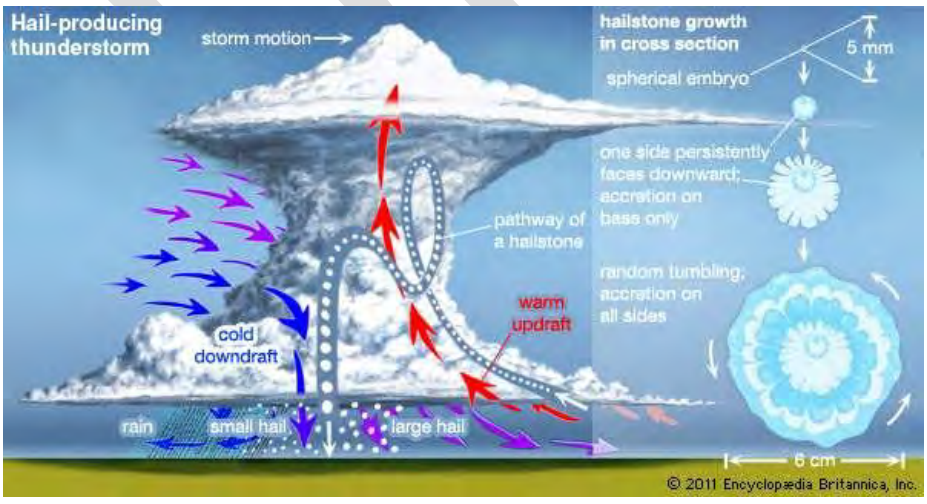


Source: Weather Underground date unknown

Hailstorms

Hail forms inside a thunderstorm or other storms with strong updrafts of warm air and downdrafts of cold water. If a water droplet is picked up by the updrafts, it can be carried well above the freezing level. Water droplets freeze when temperatures reach 32 degrees Fahrenheit (°F) or colder. As the frozen droplet begins to fall, it may thaw as it moves into warmer air toward the bottom of the thunderstorm. However, the droplet may be picked up again by another updraft and carried back into the cold air and re-freeze. With each trip above and below the freezing level, the frozen droplet adds another layer of ice. The frozen droplet, with many layers of ice, falls to the ground as hail. Most hail is small and typically less than 2 inches in diameter (NWS 2010). Figure 4.3.11-2 shows how hail is formed within thunderstorms.

Figure 4.3.11-2. Hail Formation in Thunderstorms



Source: Encyclopedia Britannica 2011

Windstorms

Wind begins with differences in air pressures and occurs through rough horizontal movement of air caused by uneven heating of the earth's surface. Wind occurs at all scales, from local breezes lasting a few minutes to global winds resulting from solar heating of the earth. High winds are often associated with other severe weather events such as thunderstorms, tornadoes, nor'easters, hurricanes, and tropical storms.

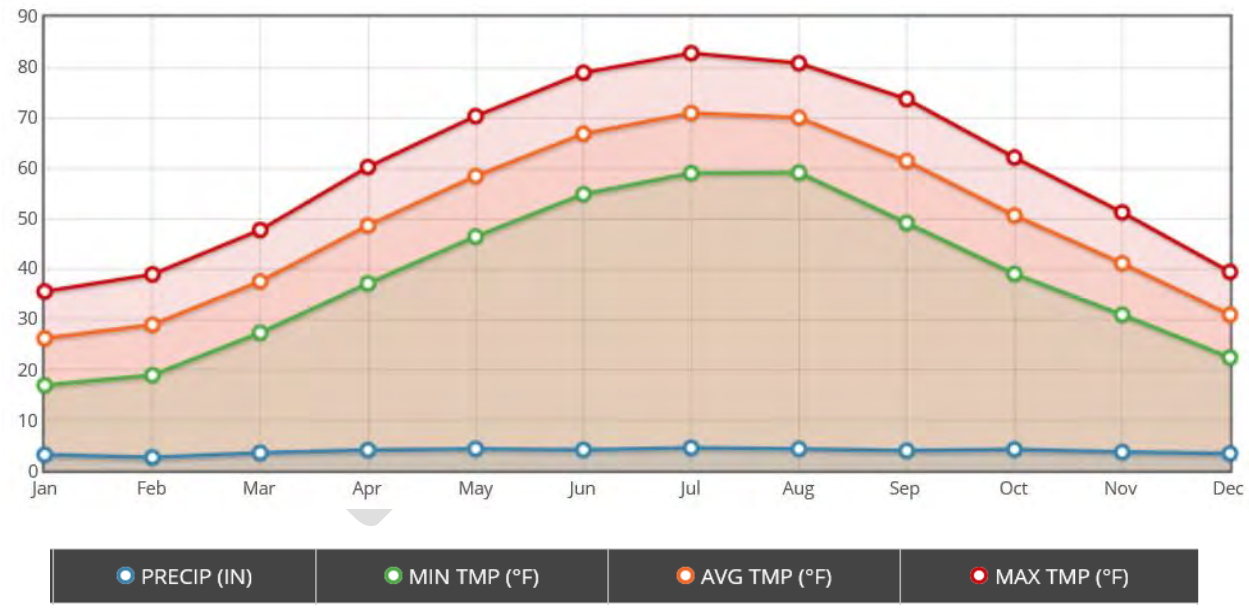
Tornadoes

A tornado appears as a rotating, funnel-shaped cloud that extends from a thunderstorm to the ground with whirling winds that can reach 250 miles per hour (mph). Damage paths can be greater than 1 mile wide and 50 miles long. Tornadoes typically develop from either a severe thunderstorm or hurricane as cool air rapidly overrides a layer of warm air. Tornadoes typically move at speeds between 30 and 125 mph and can generate combined wind speeds (forward motion and speed of the whirling winds) exceeding 300 mph. The lifespan of a tornado rarely is longer than 30 minutes (FEMA 1997). Tornadoes can occur at any time of the year, with peak seasons at different times for different states (National Severe Storms Laboratory [NSSL] 2013).

Extreme Temperatures

Extreme temperature includes both heat and cold events that can have significant direct impacts to human health and commercial/agricultural businesses and primary and secondary effects on infrastructure (e.g., burst pipes and power failure). Distinguishing characteristics of "extreme cold" or "extreme heat" vary by location, based on the conditions to which the population is accustomed. Figure 4.3.11-3 shows the average low and high temperatures each month at the Sussex Airport station in Sussex County.

Figure 4.3.11-3. Average Temperatures at Sussex Airport



Source: NWS 2020

Extreme Cold

Extreme cold events are when temperatures drop well below normal in an area. In regions relatively unaccustomed to winter weather, near freezing temperatures are considered "extreme cold." Extreme cold temperatures are generally characterized in temperate zones by the ambient air temperature dropping to

approximately 0ºF or below (Centers of Disease Control and Prevention [CDC] 2007). Extremely cold temperatures often accompany a winter storm, which can cause power failures and icy roads. Although staying indoors as much as possible can help reduce the risk of car crashes and falls on the ice, individuals may also face indoor hazards. Many homes will be too cold—either due to a power failure or because the heating system is not adequate for the weather. The use of space heaters and fireplaces to keep warm increases the risk of household fires and carbon monoxide poisoning (CDC 2007).

Extreme Heat

Extreme heat is defined as temperatures which hover 10 degrees or more above the average high temperature for a region and that last for several weeks (Centers for Disease Control and Prevention [CDC] 2016). A heat wave is defined as a period of abnormally and uncomfortably hot and unusually humid weather. Typically, a heat wave lasts two or more days. (National Weather Service [NWS] 2009). There is no universal definition of a heat wave because the term is relative to the usual weather in a particular area. The term heat wave is applied both to routine weather variations and to extraordinary spells of heat which may occur only once a century (Meehl and Tebaldi 2004).

Urbanized areas and urbanization creates an exacerbated type of risk during an extreme heat event, compared to rural and suburban areas. As defined by the U.S. Census, urban areas are classified as all territory, population, and housing units located within urbanized areas and urban clusters. The term urbanized area denotes an urban area of 50,000 or more people. Urban areas under 50,000 people are called urban clusters. The U.S. Census delineates urbanized area and urban cluster boundaries to encompass densely settled territory, which generally consists of:

- A cluster of one or more block groups or census blocks each of which has a population density of at least 1,000 people per square mile at the time.
- Surrounding block groups and census blocks each of which has a population density of at least 500 people per square mile at the time.
- Less densely settled blocks that form enclaves or indentations or are used to connect discontiguous areas with qualifying densities (U.S. Census 2010).

As these urban areas develop and change, so does the landscape. Buildings, roads, and other infrastructure replace open land and vegetation. Surfaces that were once permeable and moist are now impermeable and dry. These changes cause urban areas to become warmer than the surrounding areas. This forms an 'island' of higher temperatures (U.S. Environmental Protection Agency [EPA] 2009).

The term 'heat island' describes built up areas that are hotter than nearby rural areas. The annual mean air temperature of a city with more than one million people can be between 1.8 ºF and 5.4ºF warmer than its surrounding areas. In the evening, the difference in air temperatures can be as high as 22ºF. Heat islands occur on the surface and in the atmosphere. On a hot, sunny day, the sun can heat dry, exposed urban surfaces to temperatures 50ºF to 90ºF hotter than the air. Heat islands can affect communities by increasing peak energy demand during the summer, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and death, and water quality degradation (EPA 2010 and 2011).

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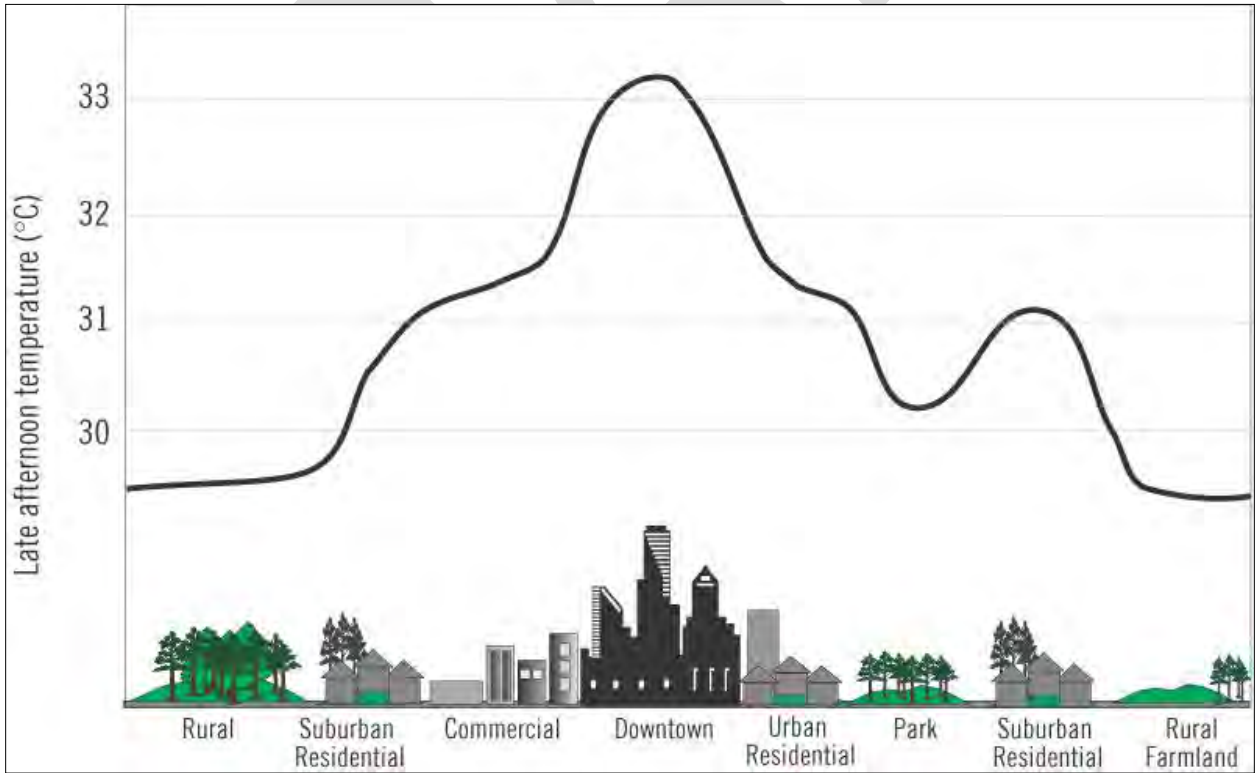
Figure 4.3.11-4 below illustrates an urban heat island profile. The graphic demonstrates that heat islands are typically most intense over dense urban areas. Further, vegetation and parks within a downtown area may help reduce heat islands (U.S. EPA 2019).

Figure 4.3.11-4. Urban Heat Island Profile

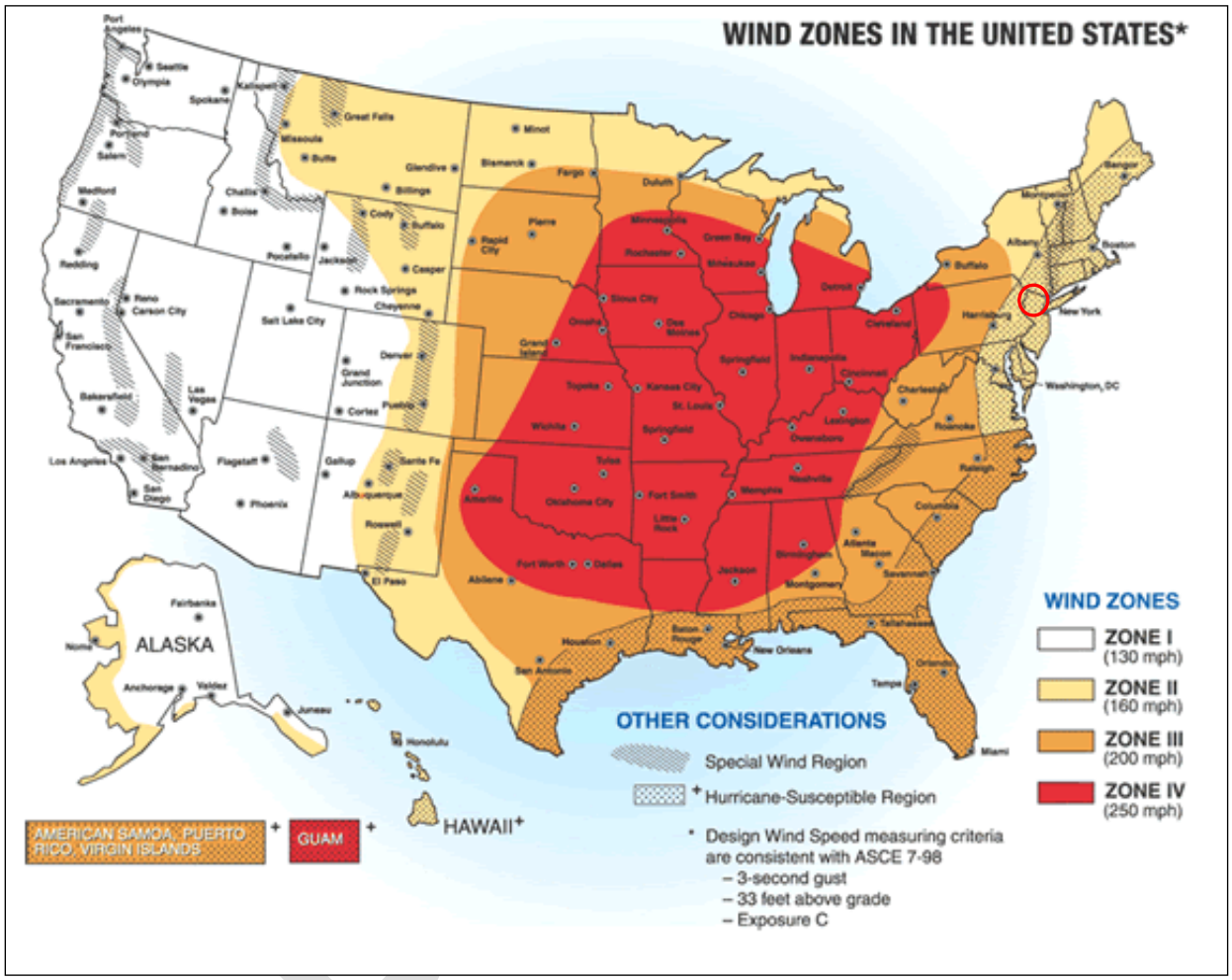


Source: EPA 2019
ºC degrees Celsius

Location

All of Sussex County is exposed to severe weather. According to the FEMA Winds Zones of the United States map, Sussex County is located in Wind Zone II, where wind speeds can reach up to 160 mph and is part of the hurricane susceptible region. Figure 4.3.11-5 illustrates wind zones across the United States, which indicate the impacts of the strength and frequency of wind activity per region. The information on the figure is based on 40 years of tornado data and 100 years of hurricane data collected by FEMA.

Figure 4.3.11-5. Wind Zones in the United States



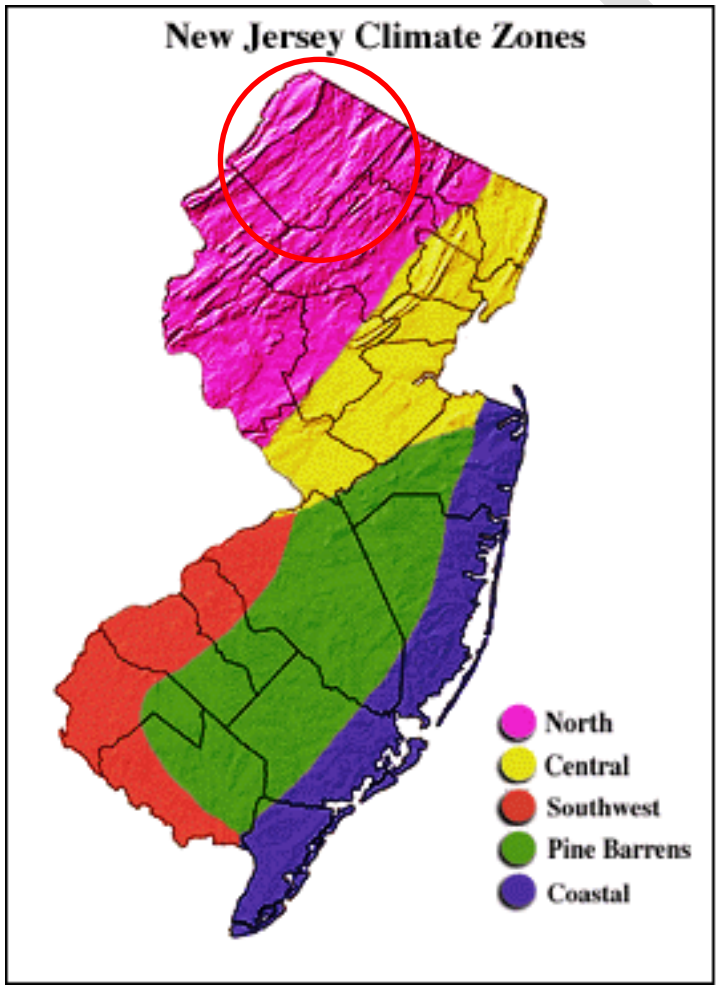
Source: *FEMA 2012*
Note: *The red circle indicates the approximate location of Sussex County.*

According to the ONJSC, New Jersey has five distinct climate regions. Elevations, latitude, distance from the Atlantic Ocean, and landscape (e.g. urban, sandy soil) produce distinct variations in the daily weather between each of the regions. The five regions include: Northern, Central, Pine Barrens, Southwest, and Coastal (ONJSC Rutgers University n.d.). Figure 4.3.11-6 depicts these regions. Sussex County is located within the Northern Climate Region.

The Northern Region covers about one-quarter of New Jersey and consists mainly of elevated highlands and valleys which are part of the Appalachian Uplands. Surrounded by land, this region can be characterized as having a continental type of climate with minimal influence from the Atlantic Ocean, except when the winds

contain an easterly component. Prevailing winds are from the southwest in summer and from the northwest in winter. Being in the northernmost portion of the state, and with small mountains up to 1800 feet in elevation, the Northern Zone normally exhibits a colder temperature regime than other climate regions of the State. This difference is most dramatic in winter when average temperatures in the Northern Zone can be more than ten degrees Fahrenheit cooler than in the Coastal Zone. A storm track extending from the heart of the Mississippi Valley, over the Great Lakes, and along the St. Lawrence Valley is a major source of precipitation for this region. Coastal storms, with precipitation shields that reach well enough inland add to the precipitation totals. During the warm season, thunderstorms are responsible for most of the rainfall. Cyclones and frontal passages are less frequent during this time. Thunderstorms spawned in Pennsylvania and New York State often move into Northern New Jersey, where they often reach maximum development in the evening. This region has about twice as many thunderstorms as the coastal zone, where the nearby ocean helps stabilize the atmosphere. The Northern Climate Zone usually has the shortest growing season, about 155 days. The average date for the last killing Spring frost is May 4. The first frost in Fall is around October 7. The exact dates vary significantly within the region as well as from year to year. Some valley locations have observed killing frost in mid-September and as late as mid-June (ONJSC Rutgers University n.d.).

Figure 4.3.11-6. Climate Regions of New Jersey



Source: *ONJSC Rutgers University n.d.*

Note: *The red circle indicates the location of Sussex County. The County is located in the North Climate Zone of New Jersey.*

Extent

The extent (severity or magnitude) of a severe storm is largely dependent upon the most damaging aspects of each type of severe weather. This section describes the extent of thunderstorms, lighting, hail, windstorms, and tornadoes in Sussex County. Historical data presented in Table 4.3.11-1 shows the most powerful severe weather records in Sussex County.

Table 4.3.11-1. Severe Storm Extent in Sussex County (1950-2020)

Extent of Severe Storms in Sussex County	
Largest Hailstone on Record	1.75 inches
Strongest Tornado on Record	EF-2
Highest Wind Speed on Record	63 knots

Source: NOAA-NCEI 2019

Thunderstorms

NWS considers a thunderstorm severe if it produces damaging wind gusts of 58 mph or higher, hail 1 inch (quarter size) in diameter or larger, or tornadoes (NWS 2010). Severe thunderstorm watches and warnings are issued by the local NWS office and NOAA's Storm Prediction Center (SPC). NWS and SPC will update the watches and warnings and will notify the public when they are no longer in effect. Watches and warnings for thunderstorms in New Jersey are defined as follows:

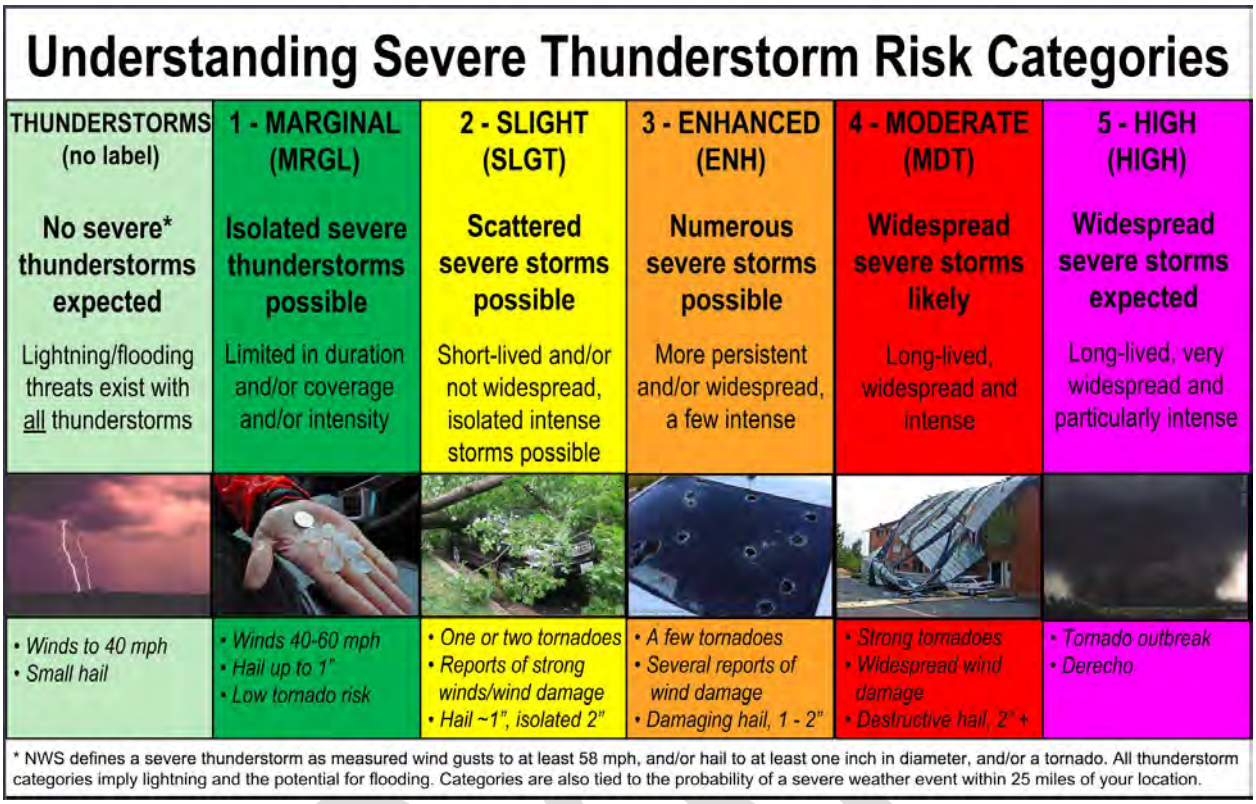
- *Severe Thunderstorm Warnings* are issued when there is evidence based on radar or a reliable spotter report that a thunderstorm is producing (or is forecast to produce) wind gusts of 58 mph or greater, structural wind damage, and hail 1 inch in diameter or greater. A warning will include the location of the storm, the municipalities that are expected to be impacted, and the primary threat associated with the severe thunderstorm warning. After it has been issued, the NWS office will follow up periodically with Severe Weather Statements, which contain updated information on the severe thunderstorm and will let the public know when the warning is no longer in effect (NWS 2010).

- *Severe Thunderstorm Watches* are issued by the SPC when conditions are favorable for the development of severe thunderstorms over a larger-scale region for a duration of at least 3 hours. Tornadoes are not expected in such situations, but isolated tornado development may also occur. Watches are normally issued well in advance of the actual occurrence of severe weather. During the watch, NWS will keep the public informed on developments happening in the watch area and will also notify the public when the watch has expired or been cancelled (NWS 2010).

- *Special Weather State for Near Severe Thunderstorms* bulletins are issued for strong thunderstorms that are below severe levels, but still may have some adverse impacts. Usually, they are issued for the threat of wind gusts of 40 to 58 mph or small hail less than one (1) inch in diameter (NWS 2010).

In addition, the SPC issues severe thunderstorm risk maps based on the likelihood of different severities of thunderstorms. Figure 4.3.11-7 shows the SPC's severe thunderstorm risk categories.

Figure 4.3.11-7. Severe Thunderstorm Risk Categories



Source: NOAA SPC 2017

Lightning

Lightning is most often associated with moderate to severe thunderstorms. The severity of lightning refers to the frequency of lightning strikes during a storm. Multiple devices are available to track and monitor the frequency of lightning.

Hail

The severity of a hailstorm is measured by duration, hail size, and geographic extent. Most hail stones from hailstorms are made up of variety of sizes. The size of hail is estimated by comparing it to a known object. Table 4.3.11-2 describes the different sizes of hail as compared to real-world objects and lists approximate measurements.

Table 4.3.11-2. Hail Size

Description	Diameter (in inches)	Description	Diameter (in inches)
Pea	0.25	Golf ball	1.75
Marble or mothball	0.50	Hen's egg	2.00
Penny or dime	0.75	Tennis ball	2.5
Nickel	0.88	Baseball	2.75
Quarter	1.00	Tea cup	3.00

Description	Diameter (in inches)
Half dollar	1.25
Walnut or ping pong ball	1.50

Description	Diameter (in inches)
Grapefruit	4.00
Softball	4.50

Source: NOAA 2012

Windstorms

Table 4.3.11-3 provides the NWS descriptions of winds during wind-producing events.

Table 4.3.11-3. NWS Wind Descriptions

Descriptive Term	Sustained Wind Speed (mph)
Strong, dangerous, or damaging	≥40
Very windy	30-40
Windy	20-30
Breezy, brisk, or blustery	15-25
None	5-15 or 10-20
Light or light and variable wind	0-5

Source: NWS 2015

NWS issues advisories and warnings for winds, which are normally site-specific. High wind advisories, watches, and warnings are issued by the NWS when wind speeds may pose a hazard or may be life threatening. The criterion for each of these varies from state to state. Wind warnings and advisories for New Jersey are as follows:

- *High Wind Warnings* are issued when sustained winds of 40 mph or greater are forecast for 1 hour or longer, or wind gusts of 58 mph or greater are forecast for any duration.
- *Wind Advisories* are issued when sustained winds of 30 to 39 mph are forecast for one 1 hour or longer, or wind gusts of 46 to 57 mph are forecast for any duration (NWS 2015).

Tornado

The magnitude or severity of a tornado is categorized using the Enhanced Fujita Tornado Intensity Scale (EF Scale). Table 4.3.11-8 illustrates the relationship between EF ratings, wind speed, and expected tornado damage.

Figure 4.3.11-8. Enhanced Fujita Tornado Intensity Scale Ratings, Wind Speeds, and Expected Damage

EF Rating	Wind Speeds	Expected Damage		
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.		
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.		
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.		
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.		
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.		
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.		

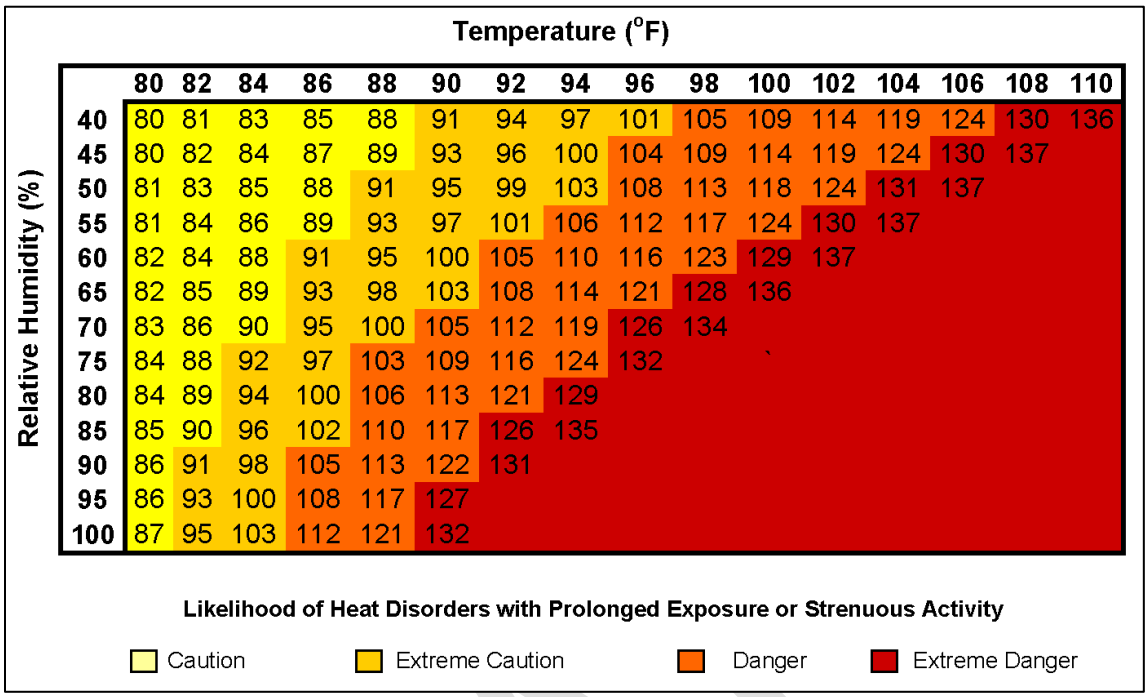
Source: NWS 2018

Tornado watches and warning are issued by the local NWS office. A tornado watch is released when tornadoes are possible in an area. A tornado warning means a tornado has been sighted or indicated by weather radar. The current average lead time for tornado warnings is 13 minutes. Occasionally, tornadoes develop so rapidly, that little, if any, advance warning is possible (NOAA 2011).

Extreme Heat

NOAA's heat alert procedures are based mainly on Heat Index values. The Heat Index is given in degrees Fahrenheit. The Heat Index is a measure of how hot it really feels when relative humidity is factored in with the actual air temperature. To find the Heat Index temperature, the temperature and relative humidity need to be known. Once both values are known, the Heat Index will be the corresponding number with both values (Figure 5.4.8-1). The Heat Index indicated the temperature the body feels. It is important to know that the Heat Index values are devised for shady, light wind conditions. Exposure to full sunshine can increase heat index values by up to 15°F. Strong winds, particularly with very hot dry air, can also be extremely hazardous (NWS 2013).

Figure 4.3.11-9. NWS Heat Index Chart



Source: *NWS 2015c*
°F *degrees Fahrenheit*
% *percent*

Figure 4.3.11-10. Adverse Effects of Prolonged Exposures to Heat on Individuals

Category	Heat Index	Health Hazards
Extreme Danger	130 °F – Higher	Heat Stroke / Sunstroke is likely with continued exposure.
Danger	105 °F – 129 °F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Extreme Caution	90 °F – 105 °F	Sunstroke, muscle cramps, and/or heat exhaustions possible with prolonged exposure and/or physical activity.
Caution	80 °F – 90 °F	Fatigue possible with prolonged exposure and/or physical activity.

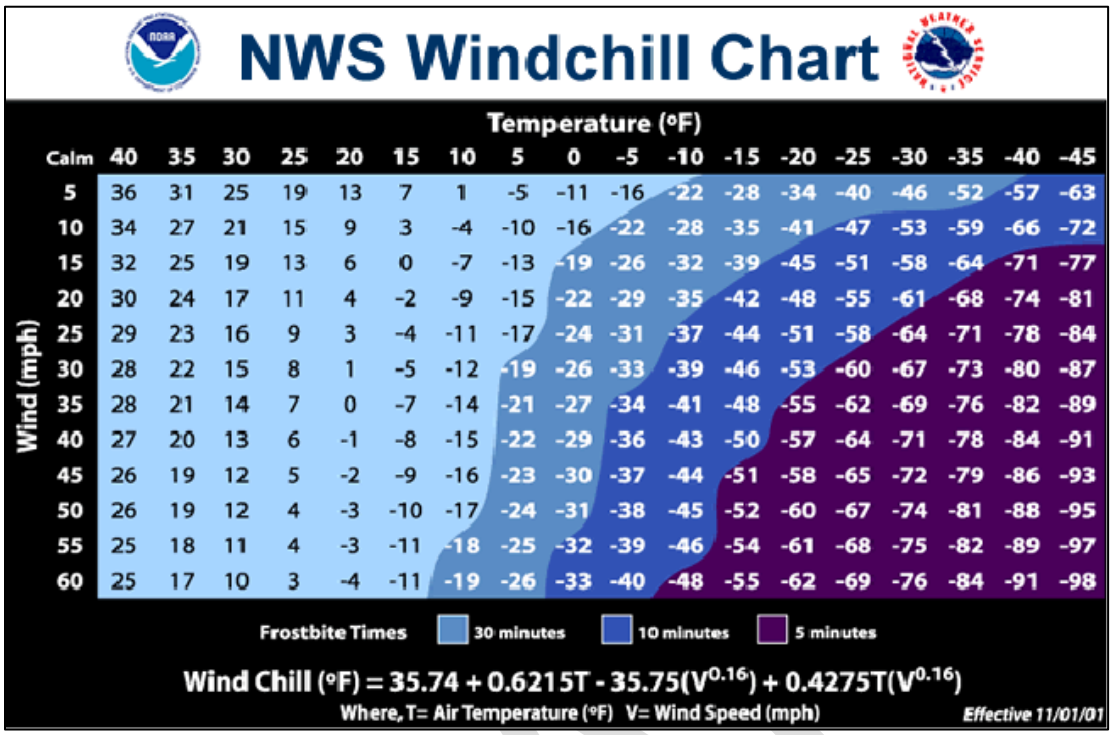
Source: *NWS 2009*
°F *degrees Fahrenheit*

Extreme Cold

The extent (severity or magnitude) of extreme cold temperatures are generally measured through the Wind Chill Temperature (WCT) Index. Wind Chill Temperature is the temperature that people and animals feel when outside and it is based on the rate of heat loss from exposed skin by the effects of wind and cold. As the wind increases, the body is cooled at a faster rate causing the skin's temperature to drop (NWS n.d.).

On November 1, 2001, the NWS implemented a new WCT Index. It was designed to more accurately calculate how cold air feels on human skin. The table below shows the new WCT Index. The WCT Index includes a frostbite indicator, showing points where temperature, wind speed, and exposure time will produce frostbite to humans. Figure 5.4.8-3 shows three shaded areas of frostbite danger. Each shaded area shows how long a person can be exposed before frostbite develops (NWS n.d.).

Figure 4.3.11-10. NWS Wind Chill Index



Source: NWS n.d.
°F degrees Fahrenheit
mph miles per hour

Warning Time

Meteorologists can accurately forecast extreme temperature event development and the severity of the associated conditions with several days lead time. These forecasts provide an opportunity for public health and other officials to notify vulnerable populations. For heat events, the NWS issues excessive heat outlooks when the potential exists for an excessive heat event in the next three to seven days. Watches are issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. Excessive heat warning/advisories are issued when an excessive heat event is expected in the next 36 hours. Winter temperatures may fall to extreme cold readings with no wind occurring. Currently, the only way to headline very cold temperatures is with the use of the NWS-designated Wind Chill Advisory or Warning products. When actual temperatures reach Wind Chill Warning criteria with little to no wind, extreme cold warnings may be issued (NWS n.d.).

Previous Occurrences and Losses

Between 1954 and 2020, Sussex County has been included in 15 declarations for severe storm-related events classified as severe storm (FEMA 2020). Severe weather events that have impacted Sussex County between 2015 and 2020 are identified in Tables 4.3.11-4 and 4.3.11-5. Please see Section 9 (Jurisdictional Annexes) for detailed information regarding impacts and losses to each municipality.

The USDA Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2020, Sussex County was included in two severe storm related agricultural disaster declarations. In 2019, Sussex County was included in declaration S4479 for excessive precipitation and S4455 for the combined effects of excessive rainfall, moisture, and storm-force winds from Hurricane Florence. In 2019, indemnities for moisture/precipitation/rain for all other crops totaled $43,692.

Table 4.3.11-4. Severe Storm-related FEMA Disaster Declarations

Declaration	Event Date	Declaration Date	Event Description
DR-1337	August 12-21, 2000	August 17, 2000	Severe Storms, Flooding & Mudslides
DR-1563	September 18 - October 1, 2004	October 1, 2004	Severe Storms and Flooding
DR-1588	April 1-3, 2005	April 19, 2005	Severe Storms and Flooding
DR-1653	June 23 - July 10, 2006	July 7, 2006	Severe Storms and Flooding
DR-1694	April 14-20, 2007	April 26, 2007	Severe Storms and Inland and Coastal Flooding
DR-4039	September 28 - October 6, 2011	October 14, 2011	Remnants of Tropical Storm Lee
DR-4048	October 29, 2011	November 30, 2011	Severe Storm

Source: FEMA 2020

Table 4.3.11-5. Severe Weather Events in Sussex County, 2015 to 2020

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
January 4, 2015	Strong Wind	N/A	N/A	Sussex County	A strong cold frontal passage brought strong winds in its wake into New Jersey during the evening and overnight on the 4th. The strongest winds occurred in eastern New Jersey and over the higher terrain of northwest New Jersey. Peak gusts in those locations averaged 50 to 55 mph, while elsewhere most peak gusts were between 40 and 45 mph. The strong winds knocked down weak tree limbs, trees and wires and caused isolated power outages. Peak wind gusts included 54 mph in High Point (Sussex County). $2K in property damage was reported.
January 7-8, 2015	Cold/Wind Chill	N/A	N/A	Sussex County	Narrative The arrival of an arctic air mass brought one of the coldest mornings of the month of January to most of New Jersey. Morning low temperatures were mainly in the single numbers above zero. In addition, gusty northwest winds continued into the morning and lowest hourly wind chill factors reached around degrees below zero throughout the state. Actual low temperatures included 2 degrees below zero in Walpack (Sussex County). Lowest hourly wind chill factors included 11 degrees below zero in Sussex (Sussex County).
February 2, 2015	Strong Wind	N/A	N/A	Sussex County	Strong, gusty northwest winds occurred in the wake of a departing and intensifying low pressure system during the late afternoon into the middle of the evening on the 2nd in New Jersey. Peak wind gusts average around 50 mph and knocked down weak trees, tree limbs and

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					wires. Scattered power outages occurred. This was further exacerbated by snow and ice on tree limbs in the northwest part of the state. Peak winds included 56 mph in Wantage (Sussex County). $7K in property damage was reported.
February 12-13	Strong Wind, Cold/Wind Chill	N/A	N/A	Sussex County	Strong gusty northwest winds occurred behind a secondary cold frontal passage in New Jersey during the evening and overnight on the 12th. Peak wind gusts averaged around 55 mph over the higher terrain of Sussex County. $5K in property damage was reported. Northwest winds that persisted into the morning of the 13th combined with an arctic air mass to produce wind chill factors of around 10 degrees below zero and low temperatures in the positive single numbers throughout most of New Jersey. Actual morning low temperatures included zero in Walpack (Sussex County).
February 15, 2015	High Wind, Cold/Wind Chill	N/A	N/A	Sussex County	The increasing pressure difference (gradient) between a rapidly intensifying low pressure system offshore and an arctic high pressure system moving east from the Great Lakes caused strong to high damaging northwest winds to occur in New Jersey from the late evening of the 14th into the afternoon of the 15th. Strong wind gusts started late in the evening on the 14th, peaked during the morning of the 15th and continued into the afternoon of the 15th. The highest winds occurred in the southern half of the state and in the higher terrain of Sussex County. In these latter locations, peak wind gusts averaged around 60 mph. $10K in property damage was reported. The combination of strong to high winds and an approaching arctic air mass produced wind chill factors of 10 to 15 degrees below zero during the first half of the day on the 15th in New Jersey.
February 19-20, 2015	Cold/Wind Chill	N/A	N/A	Sussex County	The arrival of another arctic air mass brought some of the lowest wind chills as well as the lowest temperatures of the winter season to New Jersey on the 20th and 21st. As far as wind chill factors went, the first half of the day on the 20th was colder with wind chill factors as low as around 20 degrees below zero during the morning. Actual low temperatures were around zero. On the morning of the 21st, little, if any, wind was present as the arctic high pressure system was nearby.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					Low temperatures in more rural inland areas were lower, many were below zero, some well below zero. But, because of the lack of wind, wind chill factors nearly matched the air temperatures and it felt relatively warmer on the morning of the 21st.
February 24, 2015	Cold/Wind Chill	N/A	N/A	Sussex County	The high pressure system responsible for third and last arctic blast of the month of February arrived in New Jersey on the morning of the 24th. Unlike the two previous arctic outbreaks earlier this month, this one was not accompanied by strong winds during the first half of the day. Air and wind chill temperatures were nearly the same. The calm conditions and snow cover combined to give many locations in northwest New Jersey the coldest morning of the winter season and comparably cold to the 20th and 21st weather in the rest of the state. Actual low temperatures included 19 degrees below zero in Walpack (Sussex County) and 15 degrees below zero in Sussex (Sussex County).
April 4, 2015	Strong Wind	N/A	N/A	Sussex County	Strong, gusty northwest winds circulating around an intensifying low pressure system and approaching high pressure system had the greatest impact across northern New Jersey and coastal southern New Jersey during the second half of the morning into the afternoon on the 4th. Peak wind gusts in these areas reached between 45 mph and 50 mph and knocked down weak tree limbs and wires. In the rest of the southern half of the state, while still windy, most peak wind gusts were less than 40 mph. Peak wind gusts included 48 mph in Wantage (Sussex County).
May 16, 2015	Thunderstorm Wind	N/A	N/A	Middleville	A lee side trough coupled with an unseasonably warm air mass helped trigger an area of showers and thunderstorms that moved through New Jersey during the very late afternoon and first half of the evening on the 16th. This included one severe thunderstorm in Sussex County. The thunderstorms caused outages to a couple of thousand homes and businesses, mainly in the northwest part of the state. Jersey Central Power and light reported that 1,600 of its customers were still without power at 11 p.m. EDT on the 16th.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					A severe thunderstorm knocked down large tree limbs and wires in Stillwater Township.
June 12, 2015	Thunderstorm Wind	N/A	N/A	Green Twp, Fredon Twp, Newton	A lee side trough preceding a cold front combined with an unseasonably hot and humid air mass to trigger scattered strong to locally severe thunderstorms in northwest New Jersey during the late afternoon and early evening of the 12th. A severe thunderstorm knocked down trees and wires in Green Township. The same severe thunderstorm knocked down multiple trees in Fredon Township. A severe thunderstorm also knocked down trees and wires in Newton.
June 21, 2015	Thunderstorm Wind	N/A	N/A	Wantage Twp	Scattered strong thunderstorms moved through western New Jersey during the afternoon and evening of the 21st. An isolated severe thunderstorm occurred in Sussex County. A severe thunderstorm tore down power lines in Wantage Township.
June 23, 2015	Thunderstorm Wind	N/A	N/A	Wantage Twp, Veron Twp	A severe thunderstorm knocked down a few trees along Central School Road in Wantage Township. A severe thunderstorm knocked down a few trees in Vernon Township.
July 19, 2015	Heat	N/A	N/A	Sussex County	Unseasonably hot and humid weather affected most of New Jersey on the 19th and 20th. High temperatures in most areas reached into the lower to mid 90s both days. The 19th was slightly hotter and more humid overall. The combination of heat and humidity brought afternoon heat index values as high as 100F to 105F on the 19th. These were some of the highest heat index values of the entire summer. A dissipating cold front on the 20th brought slightly drier air into the region during the afternoon of the 20th and heat index values peaked around 100F . A re-enforcing cold frontal passage on the 21st brought even cooler and drier air into the area and by the 22nd all high temperatures were less than 90 degrees in New Jersey.
January 4-5, 2016	Cold/Wind Chill	N/A	N/A	Sussex County	Northwest winds that persisted into the morning of the 5th, combined with an arctic air mass - the coldest of the season so far - produced wind chill factors between minus 10 and minus 30 degrees below zero. The coldest wind chill factors were located in the higher elevations

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					where the wind was strongest and temperatures the lowest. The lowest hourly wind chill factor at High Point was minus 27 degrees, which occurred at 0310EST, and minus 15 degrees near Flatbrookville, which occurred at 0314EST. Actual morning low temperatures were in the above zero single numbers and included 4 degrees in Sussex, 5 degrees at Sussex Airport, and 6 degrees in Pellettown. The unseasonably cold arctic air mass and low wind chill factors were caused by the strong northwest wind flow over 30 MPH produced by a deepening mid-level trough over the eastern part of the country, and an arctic high pressure system moving east into the region. Cold temperatures were repeated the following night, but with less wind, wind chill factors were closer to the actual air temperatures.
February 13-14, 2016	Extreme Cold/Wind Chill	N/A	N/A	Sussex County	Wind Chill values dropped to 25 degrees below zero at 0553EST at Sussex County Airport, with northwest wind gusts as high as 25 MPH. The actual air temperature at this time was 6 degrees below zero. The highest wind gust reported at this station was 30 MPH at 1353EST Saturday, February 13th. A wind chill value of 46 degrees below zero was reported at a Safetynet site at Highpoint at 0530EST.
February 24, 2016	Strong Wind	N/A	N/A	Wantage	A strong low pressure system moving north through the Great Lakes region, combined with its associated warm front and cold front, copious amounts of moisture, and low level jet, produced strong to severe thunderstorms, heavy rain, flash flooding, and stream flooding in New Jersey late Wednesday afternoon and evening, February 24th, with stream flooding continuing into Thursday, February 25th. Thousands were without power for a period across the state, focused in South Jersey. A 55 MPH thunderstorm wind gust was measured in Wantage.
April 3, 2016	High Wind	N/A	N/A	Sussex County	A strong cold front associated with a low pressure system moving through New York State swept across the area during the late evening hours of April 2nd and early morning hours of April 3rd, accompanied by thunderstorms, very strong convectively driven winds, and small hail. As colder air behind this front

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					drained south, precipitation changed to snow, with up to three inches falling in the higher elevations of northwest New Jersey and lesser amounts in isolated spots through most of New Jersey. The parent low pressure system then quickly intensified as it continued to move northeast away from the area. The gradient between this low pressure system and incoming high pressure produced strong winds gusting over 60 MPH in some localities from late overnight through the morning hours of April 3rd. Numerous reports of downed trees and wires throughout the county due to high winds.
June 5, 2016	Thunderstorm Wind	N/A	N/A	Wantage, Fredon	A cold front moving into an unstable air mass over New Jersey set off numerous showers and thunderstorms during the late afternoon hours on the 5th. Lightning with these thunderstorms was somewhat limited, so straight-line winds and heavy downpours were the major threat as these storms moved through the area. Thousands of people lost power as a result of the storms. Many wind gusts from 60 to over 70 MPH were recorded across the region. The highest gust was in Gloucester TWP at 74 mph. Rainfall amounts across the northern parts of the state did surpass an inch with the highest total 1.58 inches in Wantage. Downed trees due to winds leading to road closures were reported in Wantage. Trees and branches were downed in Fredon.
July 25, 2016	Thunderstorm Wind	N/A	N/A	Five Points	A trough of low pressure led to the development of afternoon and evening showers and thunderstorms which became severe in spots and produced locally heavy rains. 40,000 were left without power across the state. Several trees downed due to thunderstorm winds in Five Points.
August 16, 2016	Thunderstorm Wind	N/A	N/A	Middleville, Montague, Five Points	Trees, poles and wires were taken down due to thunderstorm winds in Middleville Montague, and Five Points.
September 14, 2016	Thunderstorm Wind	N/A	N/A	Newton, Cranberry Lake, Hopatcong, Lake Mohawk, Sparta	A cluster of thunderstorms developed ahead of a cold front and moved across northern New Jersey during the late afternoon hours of the 14th. Some of the thunderstorms produced damaging winds. Trees were downed by thunderstorm wind gusts closing a few roads in Newton. Several trees were taken down due to thunderstorm winds in Cranberry

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					Lake. One large tree fell onto and downed power lines. A 52 kt wind gust was recorded in Hopatcong. A 63 kt wind gust was reported in Lake Mohawk. Several trees taken down due to thunderstorm winds blocking access to the local marina. Two boats broke anchor as the attachment was torn off from thunderstorm winds. Several trees were taken down due to thunderstorm wind gusts in Sparta.
February 13, 2017	High Wind	N/A	N/A	Hopatcong, Byram Twp	High winds blew through the area after a cold frontal passage, enough to lead to downed trees and wires during the day of the 13th and from a severe squall line early on the 13th. Temperatures were also cold enough with the main low pressure system along the front to produce a wintry mix across northern portions of the state. In terms of freezing rain across northern portions of the state, accumulations were generally light with 0.01 inches at the Sussex ASOS. Winds behind the front were also gusty. Several thousand power outages were reported with some lasting 24 hours in Sussex and Morris counties. Wires taken down due to wind throughout the county. A tree fell across Mason Drive and a pole was taken down in Hopatcong on Brooklyn Stanhope Road. A tree fell onto route 613 in Byram Twp.
February 25, 2017	Thunderstorm Wind	N/A	N/A	Middleville, Branchville, Plumsock, Quarryville, Colesville	Several days of record warmth came to an abrupt end as a strong cold front moved through the state. Moisture and instability were sufficient to develop a line of showers and thunderstorms ahead of the front. These showers and thunderstorms produced damaging winds and hail across western portions of the state. The most noteworthy damage was in Sussex county at the Space farm zoo. Several thousand people lost power as well. In Middleville, a tree was downed due to thunderstorm winds onto a house with several trees uprooted as well due to thunderstorm winds. Several large trees were snapped and uprooted in Branchville. A Blacksmith Museum building was flattened and several trees were uprooted due to thunderstorm winds in Plumsock. Some other building had siding and roof damage as well. Trees and wires were downed in Quarryville

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					due to thunderstorm winds. A large pine tree was uprooted in Colesville due to thunderstorm winds. Two metal barn roofs were torn off in Quarryville due to thunderstorm winds.
March 2, 2017	High Wind	N/A	N/A	Sussex County	An unseasonably warm, very moist, and unstable air mass, characterized by temperatures in the 70s and Dew Points in the upper 50s to lower 60s, was conducive to maintaining a line of thunderstorms along a pre-frontal trough, as they crossed the Appalachians and moved through portions of southern NJ. Although there was little in the way of lightning associated with these storms, pockets of significant wind damage occurred. A large tree fell onto a house and fence.
March 14, 2017	High Wind	N/A	N/A	Sussex County	Low pressure systems across the Ohio Valley and Carolinas phased. This led to a rapidly developing storm which tracked just offshore. A wind gust of 51 kts was measured in Sussex County.
June 13, 2017	Hail	N/A	N/A	Maple Grange, Hamburg	A severe thunderstorm impacted Sussex County, NJ. This storm produced a 46 mph wind gust and nickel size hail. Lightning also downed a tree which landed on a house. Another tree was downed due to wind on highway 23. Hail lasted for roughly 5 minutes. Tree downed on highway 23 due to wind at the highway 94 intersection in Hamburg.
August 2, 2017	Thunderstorm Wind	N/A	N/A	Fredon	A hot and humid airmass with weak boundaries led to slow moving strong to severe thunderstorms with damaging winds, hail and flooding. Over 2,000 people lost power. Wires were down on Stillwater Road in Fredon.
October 24, 2017	Strong Wind	N/A	N/A	Pellettown	A strong low pressure system over the Great Lakes and a departing high pressure system to our east lead to a tight pressure gradient and a round of strong winds. Over 25,000 homes and businesses lost power. Several school districts had to close because of the power loss. A CWOP measured gust of 39 kts was reported just southeast of Pellettown.
January 4, 2018	High Wind	N/A	N/A	Sussex County	An area of low pressure tracked up the east coast interacting with a cold front which lead to rapid development of a winter storm across the state. This storm quickly moved out by the 5th. However, snowfall accumulations and gusty winds occurred with the storm. Blizzard

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					conditions occurred along many coastal locations. Top wind gusts were generally around 40 mph across the state. Snow amounts were highest in southern and coastal New Jersey with over 6 inches, totals were only a few inches further northwest. A state of Emergency was declared during the height of the storm. Several hundred vehicles were stranded and hundreds of thousands were without power at some point. Severe cold continued for the next week leading to many locations going to code blue operations and closing of the Cape May Lewes Ferry.
March 2, 2018	High Wind	N/A	N/A	Sussex County	Numerous trees and power lines were knocked down from strong winds. Nearly 30 roads throughout the county were closed because of downed trees. As of 10 PM Saturday, March 3rd, 23,503 customers were still without power. Free water and ice was provided to affected residents. A wind gust of 48 MPH was reported by a NJWXNET weather station at High Point Monument at 1125EST on March 2nd. A 41 year old man was killed on Friday evening at 1845EST when he came in contact with live wires on Lenape Avenue in Andover, NJ that had been knocked down by the strong winds. He was pronounced dead on the scene.
April 4, 2018	High Wind	N/A	N/A	Sussex County	Low pressure developed over the Central Plains on April 3rd, deepening as it moved into the Saint Lawrence Valley on April 3rd and to Prince Edward Island on April 4th, due to a significant contrast in air masses with Continental Polar air to the north and Maritime Tropical air to the south. This lead to a strong cold frontal passage across the region on April 4th. In the wake of this front, colder air moving into the area and a tight pressure gradient lead to widespread damaging west-northwest wind gusts in excess of 50 mph on April 4th. A mesonet site in High Point Monument recorded a wind gust of 58 mph at 4 PM on April 4th.
July 1, 2018	Excessive Heat	N/A	N/A	Sussex County	Temperatures in the middle to upper 90s and dew points in the upper 60s to lower 70s led to excessive heat across portions of southeastern Pennsylvania. Heat indices reached 106 degrees at the Andover Airport AWOS on July 3rd.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
October 2, 2018	Thunderstorm Wind	N/A	N/A	Cranberry Lake, Branchville	Supercellular severe thunderstorms caused 2 tornadoes, wind damage, and hail across the region all part of a record breaking tornado outbreak across Pennsylvania. Cranberry Lake reported localized power outages and trees down. Branchville reported localized tree damage and power outages.
February 25, 2019	High Wind	N/A	N/A	Sussex County	A departing very deep cyclone combined with strong high pressure to the west yielded a strong pressure gradient from the Plains eastward to the northern Mid-Atlantic and New England regions. High winds gusting 50-60 mph resulted in scattered power outages and trees down across the region. Some minor structural damage also occurred.
April 15, 2019	Thunderstorm Wind	N/A	N/A	Stillwater Township	A severe weather outbreak impacted much of the East Coast, causing widespread straight line wind damage and a few tornadoes. An approaching frontal system with strong wind fields moving into an unusually moist April air mass contributed to the formation of a well organized line of severe convection. This line moved through the mid-Atlantic during the predawn hours of April 15. A number of thunderstorm related damage reports were received. Multiple trees and power lines were reported down in Stillwater Twp. The
May 19, 2019	Thunderstorm Wind	N/A	N/A	Sandyston Twp, Lake Owassa	A warm front moved through the mid-Atlantic on the morning of May 19. This set the stage for the warmest day of the year to that point for most of the region. The combination of daytime heating and a pre-frontal trough ahead of an approaching cold front led to thunderstorm development late in the day. Thunderstorms organized into a line which produced pockets of wind damage over eastern Pennsylvania and northern New Jersey. A brief tornado also occurred in Pennsylvania. With the loss of daytime heating, storms weakened as they moved to the northeast. A tree was reported down on Layton-Hainesville Rd. in Sandyston Twp. A tree was reported down on E Shore Rd. near Lake Owassa.
May 28, 2019	Thunderstorm Wind, Tornado	N/A	N/A	Hopatcong, Stanhope	Severe supercellular storms developed and moved into the region from the west during the mid to late afternoon hours. Storms produced large hail, damaging wind gusts, and 2 tornadoes. Tree reported down into a house on Helen Street in Hopatcong.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					A tornado touched down in Stanhope in Sussex County, New Jersey. Damage began near the Lenape Valley Regional High School. Here, several trees were snapped or uprooted. On a field in front of the school, a clear tornadic damage path was seen with three nearby trees snapped or uprooted in a cyclonic fashion. A small but anchored outbuilding was also lifted and flipped over. Further tree damage occurred at a residence across the street from the school. Damage then appeared to briefly abate, indicating the tornado likely lifted for a short time. However, a short distance further southeast, additional tornadic damage was observed with numerous trees snapped or uprooted and several homes and cars sustaining damage from falling trees on and around Unger Avenue. Including the brief time when it likely lifted, the tornado lasted approximately one to one and a half minutes. Thankfully, no injuries were reported as a result of this tornado.
June 29, 2019	Thunderstorm Wind	N/A	N/A	Cranberry Lake, Brookwood	A frontal boundary that had been stalled over the mid-Atlantic had lifted north of the region by the morning of June 29. Later that day and into the evening, the front once again approached, this time as a strong cold front, as low pressure tracked through New England and began to intensify offshore in the Gulf of Maine. The combination of strong frontal forcing and a warm, unstable environment ahead of the front led to widespread severe thunderstorms developing. Numerous reports of damaging wind, as well as some hail, were received in association with these storms. Numerous trees and telephone poles and wires were reported down in the Cranberry Lake area. A tree fell on US-206 north of I-80, closing all lanes in Brookwood.
July 17, 2019	Thunderstorm Wind	N/A	N/A	Hampton Twp, Cranberry Lake, Branchville	The remnants of Hurricane Barry moved near and west of the mid-Atlantic on July 17, in tandem with a frontal system which was absorbing the former tropical cyclone. A hot air mass existed east of this system, and the tropical moisture associated with Barry combined with the heat to create an unstable environment primed for heavy rainfall and severe weather. Widespread convection developed, with a number of storms

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					producing damaging wind. A tree was reported down in Hampton Twp. Tree blown down on N Shore Rd in the Cranberry Lake area.
July 20, 2019	Thunderstorm Wind	N/A	N/A	Branchville, Frankford Twp	An excessively hot air mass was in place over the mid-Atlantic on July 20. While the air mass was hot, the environment was otherwise generally unfavorable for convection due to mid level capping. However, some thunderstorms did develop where the cap was weaker, especially in New York but also as far south as northern New Jersey. These isolated cells produced localized wind damage. Several downed trees blocked CR-519 near Branchville. Numerous trees and power lines were downed in and near Frankford Twp.
July 21, 2019	Thunderstorm Wind	N/A	N/A	Andover Airport, Hopatcong	A slow moving cold front was approaching a very hot air mass over the mid-Atlantic on July 21. Strong instability and high moisture levels were present ahead of the front. Relatively weak shear and some mid-level dry air were limiting factors, but the frontal forcing helped to trigger scattered thunderstorms, some of which became strong to severe and produced areas of wind damage. Downed trees and power lines were reported in the Andover and Hopatcong areas.
July 22, 2019	Thunderstorm Wind	N/A	N/A	Hopatcong	A frontal boundary stalled over the mid-Atlantic on July 22. An approaching upper level trough helped spur the development of a wave of low pressure along the front. A very favorable environment for convection and severe weather developed along and south of this boundary. Extremely high moisture content was present in the air mass, allowing moderate to strong instability to build during the heating of the day. The frontal boundary and developing low also helped to enhance both low level and deep layer shear to respectably strong values for midsummer. The result was a day of widespread severe weather. Discrete storms early in the afternoon gave way to a powerful mesoscale convective system in the evening which produced widespread damaging winds with considerable damage over a large area. Trees and powerlines were downed throughout Hopatcong.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
August 8, 2019	Thunderstorm Wind	N/A	N/A	Newton, Andover	Behind a cold front, an upper level trough moved over the mid-Atlantic on August 8. Multiple shortwave impulses rotated through the broader trough over the day. The upper level energy combined with daytime heating in an otherwise marginally favorable environment to produce scattered showers and thunderstorms. A few storms became strong to severe, producing gusty winds. Tree and wires downed on Swartswood Rd in Newton. Tree and wires downed on Crescent Dr in Andover.
October 31, 2019	Thunderstorm Wind	N/A	N/A	Hopatcong, Beaver Lake	A severe weather outbreak impacted the mid-Atlantic from the evening of October 31 through the pre-dawn hours of November 1. A strong area of low pressure moved through the eastern Great Lakes on the 31st. Ahead of it, strong southerly flow advected an unseasonably warm and moist air mass into the mid-Atlantic. This generated enough instability, combined with extremely strong wind fields, to produce a low topped line of severe convection which tracked across the entire region. Widespread damaging wind occurred as the squall line moved through, along with a couple of short lived embedded tornadoes. A photo in Hopatcong showed a large tree down on power lines. The report also indicated several additional trees down on power lines with multiple transformer fires in the area. A tree was downed on NJ-23 south of Beaver Lake Rd.
February 7, 2020	High Wind	N/A	N/A	Sussex County	Following a mid-morning severe weather outbreak, the weather remained active over the mid-Atlantic into the later morning and afternoon hours on February 7. Explosively intensifying low pressure began to pull away from the region to the north, leading to a cold frontal passage. Rapid height and pressure rises on the back side of the departing low led to a period of strong and in some cases damaging synoptic winds following the damaging convective winds from earlier in the day. Winds were strongest in coastal areas. Winds began to diminish late in the day as the low moved further away and the gradients relaxed.
June 3, 2020	Thunderstorm Wind	N/A	N/A	Libertyville	A derecho developed just southeast of Lake Erie during the early morning hours of June 3, 2020, then moved rapidly southeast across Pennsylvania before

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					exiting the central New Jersey coast during the early afternoon hours, approximately 130 PM. Downed trees and wires were reported near Route 519 and Neilson Road near Wantage. Several reports of tree limbs and power lines down near Route 515 and Vernon Crossing Road near Wawayanda State Park.
June 19, 2020	Thunderstorm Wind	N/A	N/A	Sparta	Several impulses of energy rotating within the flow of a mid-level low produced scattered thunderstorms over northern New Jersey during the mid to late evening hours. While most of these thunderstorms were sub-severe, one or two reports of isolated wind damage were reported. Reports of trees and wires down near Underrock Road near Sparta.
June 28, 2020	Hail, Thunderstorm Wind	N/A	N/A	Colesvile	A cold front approaching from the west, in combination with a pre-frontal lee-side trough parked over the mid-Atlantic region, sparked afternoon and evening thunderstorms across many parts of New Jersey. In addition to strong to severe winds and heavy rain, a few thunderstorms contained large hail. Dime to nickle size hail was reported on River Road in Montague. Several reports of power lines down and power outages in the Vernon Valley area northwest of Wawayanda State Park.
July 3, 2020	Thunderstorm Wind	N/A	N/A	Glenwood, Independence Corner, McAfee	A back door cold front moving south into very hot and moderately humid air touched off showers and thunderstorms, some of them severe. Wires were reported down on McAfee-Glenwood Road in Glenwood. Wires were down on Glenwood Road in Vernon Valley. Downed tree and wires near Tall Timbers Road near Wallkill Lake with power outages in the area. Downed tree on NJ-284 southbound near Layton Road northeast of Sussex. Lane restrictions were put in place. Downed tree into a trailer near Hemlock Drive in Vernon with power lines down in the area. Trees and wires down on Valley View Drive in McAfee.
July 22, 2020	Hail	N/A	N/A	Township of Montague, Colesville	A slow moving frontal boundary was draped across upstate New York and southern New England on July 22 with multiple waves of low pressure tracking along it. The mid-Atlantic was left in a warm sector air mass south of this front. This led to a very hot and humid day on July 22 with air temperatures rising into

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					the 90s and dew point values near 70. This caused strong instability to develop. Shear values were not overly impressive, but an approaching shortwave disturbance from the Midwest did help to increase shear late in the day. This disturbance also served as forcing for convection to develop in the warm and unstable air mass. Widespread thunderstorm development occurred, with storms eventually developing into a mostly solid squall line. This line of storms produced numerous reports of wind damage across eastern Pennsylvania, New Jersey, and Delmarva. 1.25-1.50 inch hail was reported in Montague. 50 knot winds were reported. A large tree was split at a residence on Red Hill Road. A tree was downed on Deckerton Turnpike near the intersection with County Route 675. Several reports of downed trees and wires in Montague Township including near Clove Road and New Road. Reports of downed tree limbs and wires near Lake Marcia in Collesville.
August 18, 2020	Thunderstorm Wind, Hail	N/A	N/A	Township of Montague	A prefrontal trough ahead of a slow moving cold front led to a few thunderstorms developing on the afternoon of August 17. Moderate instability and weak shear generally limited storm coverage and severity, but a cluster of severe thunderstorms with damaging winds impacted portions of the Pennsylvania Poconos and northern New Jersey. Trees and wires were downed on Fox Hollow Rd near Montague.
August 25, 2020	Thunderstorm Wind	N/A	N/A	Colesville, Owens, Vernon	A strong cold front along with a mid-level shortwave trough approached the mid-Atlantic on August 25. Ahead of the disturbances, wind shear increased significantly and surface temperatures warmed, increasing instability. While some ingredients were in place for a major severe weather event, an offset in timing between the shortwave and the front, combined with greater than expected mid-level dry air, caused storms to generally struggle to develop over the mid-Atlantic. Greater storm coverage was found in more favorable environments over both New England and the Ohio Valley. However, the environment over the mid-Atlantic was still highly favorable for damaging winds, so the few

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					storms that did develop produced some instances of wind damage. A wind gust of 53 knots was measured at High Point monument in Colesville. Several reports of downed trees and wires near Mount Salem Road and Moore Road in Quarryville. Several reports of downed trees and wires near Glenwood Mount Road in Owens. Trees and wires were downed near Pondeddy Road in Vernon.

Source: FEMA 2020; NOAA-NCEI 2020; NWS 2020; SPC 2020; NJOEM 2019; NHC 2020
DR Disaster Declaration (FEMA)
FEMA Federal Emergency Management Agency
Mph miles per hour
N/A Not Applicable

Probability of Future Occurrences

It is anticipated that Sussex County will continue to experience direct and indirect impacts of severe weather events annually that may induce secondary hazards such as flooding, infrastructure deterioration or failure, utility failures, power outages, water quality and supply concerns, and transportation delays, accidents and inconveniences.

Extreme temperatures are expected to occur more frequently as part of regular seasons. Specifically, extreme heat will continue to impact New Jersey and its counties and, based upon data presented, will increase in the next several decades. As previously stated, several extreme temperature events occur each year in Sussex County. It is estimated that the county will continue to experience these events annually.

According to the NOAA National Climate Data Center (NCDC), Sussex County has experienced 402 severe weather events between 1950 and 2020. This data was used to determine the recurrence interval and the average annual number of events for the county. The table below summarizes these statistics, as well as the annual average number of events and the estimated percent chance of an incident occurring in a given year (NOAA NCDC 2020).

Table 4.3.11-6. Probability of Future Severe Weather Events

Hazard Type	Number of Occurrences Between 1950 and 2020	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	Percent chance of occurrence in any given year
Extreme Temperature	84	1.20	0.85	1.2	100%
Hail	32	0.46	2.2	0.45	45.1%
High/Strong Wind	137	1.96	0.52	1.9	100%
Lightning	19	0.27	3.7	0.27	26.8%
Thunderstorm Wind	134	1.91	0.53	1.9	100%
Tornado / Funnel Cloud	6	0.09	11.8	0.08	8.5%

Hazard Type	Number of Occurrences Between 1950 and 2020	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	Percent chance of occurrence in any given year
Total	**412**	**5.89**	**0.17**	**5.8**	**100%**

Source: NOAA-NCEI 2020

In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for severe weather in the county is considered 'frequent' (100 percent annual probability; a hazard event may occur multiple times per year, as presented in Table 4.4-1). The ranking of the severe weather hazard for individual municipalities is presented in the jurisdictional annexes.

Climate Change Impacts

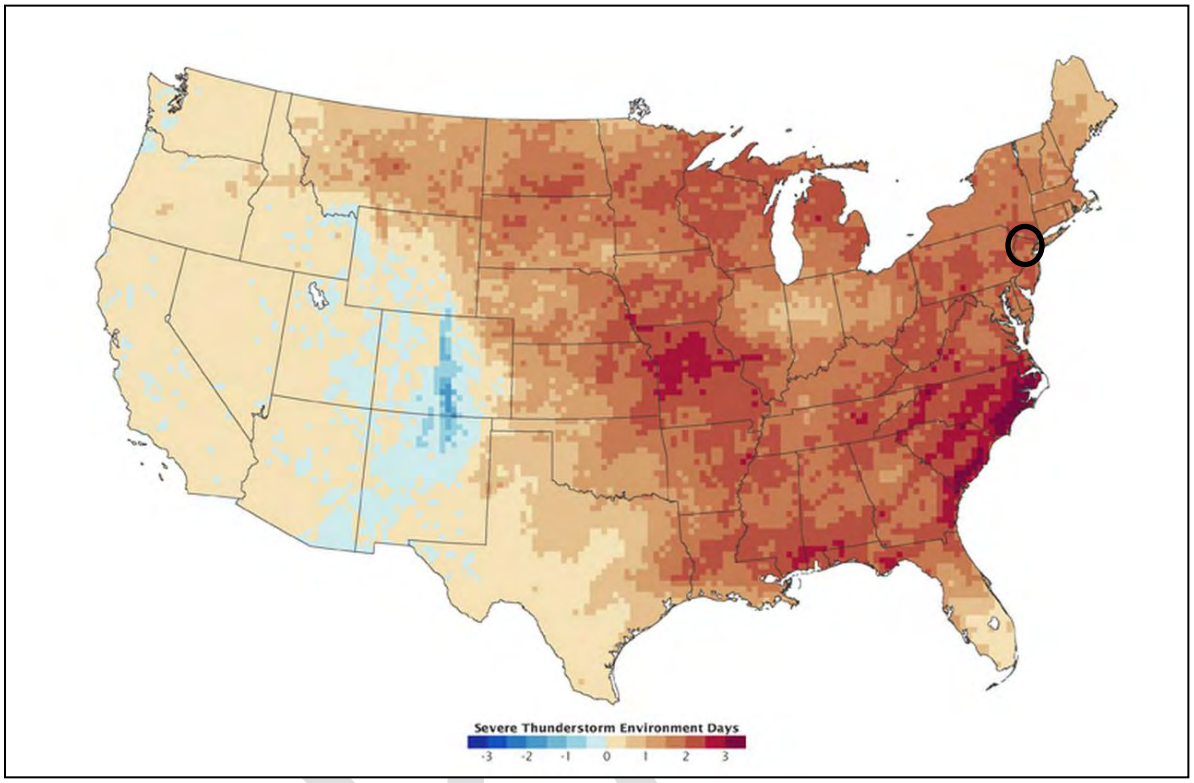
Climate change includes changes in temperature, precipitation, or wind patterns, which occur over several decades or longer. Due to the increase in greenhouse gas concentrations since the end of the 1890s, New Jersey has experienced a 3.5° F (1.9° C) increase in the State's average temperature (Office of the New Jersey State Climatologist 2020), which is faster than the rest of the Northeast region (2° F [1.1° C]) (Melillo et al. 2014) and the world (1.5° F [0.8° C]) (IPCC 2014). This warming trend is expected to continue. By 2050, temperatures in New Jersey are expected to increase by 4.1 to 5.7° F (2.3° C to 3.2° C) (Horton et al. 2015). Thus, New Jersey can expect to experience an average annual temperature that is warmer than any to date (low emissions scenario) and future temperatures could be as much as 10° F (5.6° C) warmer (high emissions scenario) (Runkle et al. 2017). New Jersey can also expect that by the middle of the 21st century, 70% of summers will be hotter than the warmest summer experienced to date (Runkle et al. 2017). The increase in temperatures is expected to be felt more during the winter months (December, January, and February), resulting in less intense cold waves, fewer sub-freezing days, and less snow accumulation.

As temperatures increase, Earth's atmosphere can hold more water vapor which leads to a greater potential for precipitation. Currently, New Jersey receives an average of 46 inches of precipitation each year (Office of the New Jersey State Climatologist 2020). Since the end of the twentieth century, New Jersey has experienced slight increases in the amount of precipitation it receives each year, and over the last 10 years there has been a 7.9% increase. By 2050, annual precipitation in New Jersey could increase by 4% to 11% (Horton et al. 2015). By the end of this century, heavy precipitation events are projected to occur two to five times more often (Walsh et al. 2014) and with more intensity (Huang et al. 2017) than in the last century. New Jersey will experience more intense rain events, less snow, and more rainfalls (Fan et al. 2014, Demaria et al. 2016, Runkle et al. 2017). Also, small decreases in the amount of precipitation may occur in the summer months, resulting in greater potential for more frequent and prolonged droughts (Trenberth 2011). New Jersey could also experience an increase in the number of flood events (Broccoli et al. 2020).

A warmer atmosphere means storms have the potential to be more intense (Guilbert et al. 2015) and occur more often (Coumou and Rahmstorf 2012, Marquardt Collow et al. 2016, Broccoli et al. 2020). In New Jersey, extreme storms typically include coastal nor'easters, snowstorms, spring and summer thunderstorms, tropical storms, and on rare occasions hurricanes. Most of these events occur in the warmer months between April and October, with nor'easters occurring between September and April. Over the last 50 years, in New Jersey, storms that resulted in extreme rain increased by 71% (Walsh et al. 2014) which is a faster rate than anywhere else in the United States (Huang et al. 2017).

Figure 4.3.11-11 illustrates the predicted change in severe thunderstorm days; overall it is anticipated New Jersey will experience an increase.

Figure 4.3.11-5. Predicted Change in Severe Thunderstorm Environment Days from the 1962-1989 Period to the 2072-2099 Period



Source: Trapp et. al. 2007
Note: The approximate location of Sussex County is indicated by the black circle

Vulnerability Assessment

A qualitative assessment was conducted to analyze the severe weather hazard for Sussex County. A probabilistic assessment was conducted for the 100- and 500-year MRPs to analyze the wind hazard and provide a range of loss estimates. These estimates are detailed in Section 4.3.8 (Hurricane and Tropical Storm).

Impact on Life, Health and Safety

The impact of severe weather events on life, health, and safety is dependent upon several factors including the severity of the event and whether adequate warning time was provided to residents. The entire population of Sussex County (142,298 people) is exposed to severe storm events (American Community Survey 2018). Residents may be displaced or require temporary to long-term sheltering due to severe weather events. The number of households displaced by severe wind events is summarized in Section 4.3.8 (Hurricane and Tropical Storms). In addition, downed trees, damaged buildings, and debris carried by high winds can lead to injury or loss of life.

Socially vulnerable populations are most susceptible, based on a number of factors including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing. Vulnerable populations include homeless persons, elderly (over 65 years old), low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from

major roads. According to the 2018 5-year American Community Survey population data, there are 7,191 persons living below the poverty level and 22,889 persons over the age of 65 within Sussex County.

Lightning can be responsible for deaths, injuries, and property damage. Lightning-based deaths and injuries typically involve heart damage, inflated lungs, or brain damage, as well as loss of consciousness, amnesia, paralysis, and burns, depending on the severity of the strike. Additionally, most people struck by lightning survive, although they may have severe burns and internal damage. People located outdoors (i.e., recreational activities and farming) are considered most vulnerable to hailstorms, thunderstorms, and tornadoes because there is little to no warning, and shelter might not be available. Moving to a lower risk location will decrease a person's vulnerability.

Impact on General Building Stock

Damage to buildings depends on several factors, including the type of event, wind speed, presence and size of hail, storm duration, path of the storm track or tornado, and distance from the tornado funnel. Several thousand dollars of reported damages have occurred in Sussex County due to severe storm events. Estimated wind-related building damages are discussed further in Section 4.3.8 (Hurricane and Tropical Storms).

Impact on Critical Facilities and Lifelines

Utility infrastructure could suffer damage from high winds associated with falling tree limbs or other debris, resulting in the loss of power or other utility service. Loss of service can impact residents, critical facilities, and business operations alike. Interruptions in heating or cooling utilities can affect populations, such the young and elderly, who are particularly vulnerable to temperature-related health impacts. Loss of power can also impact other public utilities, including potable water, wastewater treatment, and communications. Lack of power to emergency facilities, including police, fire, EMS, and hospitals, will inhibit a community's ability to effectively respond to an event and maintain the safety of its residents.

Impact on Economy

Severe storm events can have short- and long-lasting impacts on the economy. When a business is closed during storm recovery, there is lost economic activity in the form of day-to-day business and wages to employees. The longer the business is closed, the less likely they are to reopen. Overall, economic impacts include the loss of business function (e.g., tourism, recreation), damage to inventory, relocation costs, wage loss and rental loss due to the repair/replacement of buildings.

Impacts to transportation lifelines affect both short-term (e.g., evacuation activities) and long-term (e.g., day-to-day commuting and goods transport) transportation needs. Utility infrastructure (power lines, gas lines, electrical systems) could suffer damage and impacts can result in the loss of power, which can impact business operations and can impact heating or cooling provision to the population.

Section 4.3.8 (Hurricane and Tropical Storms) estimates the total economic loss caused by severe wind events. These losses include direct building losses and business interruption losses, which are the estimated costs to repair or replace the damage caused to the building and the losses associated with the inability to operate a business because of the wind damage sustained during the storm or the temporary living expenses for those displaced from their home because of the event, respectively.

Impact on Environment

The impact of severe storm events on the environment varies, but researchers are finding that the long-term impacts of more severe weather can be destructive to the natural and local environment. National organizations such as USGS and NOAA have been studying and monitoring the impacts of extreme weather phenomena as it

impacts long term climate change, streamflow, river levels, reservoir elevations, rainfall, floods, landslides, erosion, etc. (USGS 2020, NOAA n.d.). For example, severe weather that creates longer periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. Tornadoes can tear apart habitats causing fragmentation across ecosystems. Researchers also believe that a greater number of diseases will spread across ecosystems because of impacts that severe weather and climate change will have on water supplies (USGS 2020, NOAA n.d.). Overall, as the physical environment becomes more altered, species will begin to contract or migrate in response, which may cause additional stressors to the entire ecosystem within Sussex County. Refer to Section 4.3.9 (Infestation and Invasive Species) for more information about these stressors.

Future Changes That May Impact Vulnerability

Understanding future changes that effect vulnerability in the County can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. Changes in the natural environment and built environment and how they interact can also provide insight about ways to plan for the future.

Projected Development

As discussed in Section 4, areas targeted for future growth and development have been identified across the County. Any areas of growth throughout the County are vulnerable to severe storm events. New development sites should adhere to the proper building codes to protect against severe storm event elements such as high wind protection and/or flood proofing measures.

Projected Changes in Population

According to the 2018 5-year population estimates from the American Community Survey, the population of Sussex County (i.e., 142,298 persons) has decreased by approximately 4.7-percent since 2010. Even though the population has decreased, any changes in the density of population can create issues for local residents during evacuation of a natural hazard severe storm event. Historically, flooding and debris with associated severe storm events have severely impacted transportation corridors as well as infrastructure. Refer to Section 3 (County Profile), which includes a discussion on population trends for the County.

Climate Change

As discussed above, most studies project that the State of New Jersey will see an increase in average annual temperatures and precipitation. Annual precipitation amounts in the region are projected to increase, primarily in the form of heavy rainfalls, which have the potential to increase the risk of storm surge, and flood critical transportation corridors and infrastructure. Increases in precipitation may alter and expand the floodplain boundaries of storm surge areas and runoff patterns, resulting in the exposure of populations, buildings, and critical facilities and infrastructure that were previously outside the floodplain. This increase in exposure would result in an increased risk to life and health, an increase in structural losses, a diversion of additional resources to response and recovery efforts, and an increase in business closures affected by future flooding events due to loss of service or access.

Furthermore, climate is defined not simply as average temperature and precipitation but also by the type, frequency and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the prevalence and severity of events like hurricanes. While predicting changes to the prevalence or intensity of severe storms under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society and the environment (U.S. EPA 2020).

Change of Vulnerability Since the 2016 HMP

Overall, the County's vulnerability has not changed, and the entire County will continue to be exposed and vulnerable to severe weather events.

4.3.12 SEVERE WINTER WEATHER

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the severe winter weather hazard in Sussex County.

2021 HMP Changes

- Previous occurrences were updated with events that occurred between 2015 and 2020.
- A vulnerability assessment was conducted for the severe winter weather hazard utilizing updated building data.

Profile

Hazard Description

A winter storm is considered a storm with significant snowfall, ice, and/or freezing rain. The quantity of precipitation varies by elevation. Heavy snowfall in non-mountainous areas is four inches or more in a 12-hour period, or six inches or more in a 24-hour period. In mountainous areas, heavy snowfall is considered 12 inches or more in a 12-hour period or 18 inches or more in a 24-hour period. Blizzards are storms with considerable falling and/or blowing snow combined with sustained winds or frequent wind gusts of 35 mph or greater that frequently reduce visibility to less than 0.25 mile for at least three hours.

Some winter storms are large enough to immobilize an entire region while others may only affect a single community. Winter storms are typically accompanied by low temperatures, high winds, freezing rain or sleet, and heavy snowfall. The aftermath of a winter storm can have an impact on a community or region for days, weeks, or even months; potentially causing cold temperatures, flooding, storm surge, closed and/or blocked roadways, downed utility lines, and power outages. In Sussex County, winter storms include blizzards, snowstorms, Nor'Easters and ice storms. Extreme cold temperatures, wind chills and Nor'Easters are also associated with winter storms; however, based on input from the Planning Committee, these events are further discussed in this plan in Section 4.3.10 (Nor'Easters) and Section 4.3.11 (Severe Weather).

Heavy Snow

According to the National Snow and Ice Data Center (NSIDC), snow is precipitation in the form of ice crystals. It originates in clouds when temperatures are below the freezing point (32 degrees Fahrenheit [°F]), when water vapor in the atmosphere condenses directly into ice without going through the liquid stage. Once an ice crystal has formed, it absorbs and freezes additional water vapor from the surrounding air, growing into snow crystals or snow pellets, which then fall to the earth. Snow falls in different forms, such as snowflakes, snow pellets, or sleet. Snowflakes are clusters of ice crystals that form from a cloud. Snow pellets are opaque ice particles in the atmosphere. They form as ice crystals fall through super-cooled cloud droplets that are below freezing but remain a liquid. The cloud droplets then freeze to the crystals. A heavy snowstorm is defined as a snowstorm with accumulations of 4 inches or more of snow in a 6-hour period, or 6 inches of snow in a 12-hour period (NWS 2009).

Blizzards

A blizzard is a winter snowstorm with sustained or frequent wind gusts of 35 mph or more, accompanied by falling or blowing snow reducing visibility to or below 0.25 mile. These conditions must be the predominant over a 3-hour period. Extremely cold temperatures are often associated with blizzard conditions, but are not a formal part of the definition. The hazard, created by the combination of snow, wind, and low visibility, significantly increases when temperatures are below 20°F. A severe blizzard is categorized as having

temperatures near or below 10°F, winds exceeding 45 mph, and visibility reduced by snow to near zero. Storm systems powerful enough to cause blizzards usually form when the jet stream dips far to the south, allowing cold air from the north to clash with warm, moister air from the south. Blizzard conditions often develop on the northwest side of an intense storm system. The difference between the lower pressure in the storm and the higher pressure to the west creates a tight pressure gradient, resulting in strong winds and extreme conditions caused by the blowing snow (The Weather Channel 2012).

Sleet

Sleet is made up of drops of rain that freeze into ice as they fall. They are usually smaller than 0.30 inch in diameter (NSIDC 2013). A sleet storm involves significant accumulations of solid pellets, which form from the freezing of raindrops or partially melted snowflakes causing slippery surfaces, posing a hazard to pedestrians and motorists (NWS 2009).

Freezing Rain

Freezing rain occurs when rain falls into areas that are below freezing. In order for this to occur, ground-level temperatures must be colder than temperatures aloft. Freezing rain can also occur when the air temperature is slightly above freezing but the surface that the rain lands upon is still below freezing from prior cold air temperatures (NWS 2009).

An ice storm is an event caused by damaging accumulations of ice during freezing rain events. An ice storm involves significant accumulation of rain or drizzle freezing on objects (trees, power lines, roadways, etc.) as it strikes them, causing slippery surfaces and damage from sheer weight of ice accumulations (NWS 2009). Significant ice accumulations are typically 0.25 inch or greater (National Weather Service [NWS] 2013).

Location

Snow and Blizzards

The trajectory of the storm center—whether it passes close to the New Jersey coast or at a distance—largely determines both the intensity and the duration of the snowfall over the State. Winter storms tend to have the heaviest snowfall within a 150-mile wide swath to the northwest of what are generally southwest to northeast moving storms. Depending on whether all or a portion of New Jersey falls within this swath, the trajectory determines which portion of the State (or all of the State) receives the heaviest amount of snow. According to the ONJSC, normal seasonal snowfall in Sussex County is approximately 40 to 50 inches (ONJSC n.d).

Ice Storms

All regions of New Jersey are subject to ice storms. The distribution of ice storms often coincides with general distribution of snow within several zones in the State. A cold rain may be falling over the southern portion of the State, freezing rain over the central region, and snow over the northern counties as a coastal storm moves northeastward offshore. A locality's distance to the passing storm center is often the crucial factor in determining the temperature and type of precipitation during a winter storm. Based on data from 1948–2000, Sussex County can anticipate 5-6 days with freezing rain per year (Changnon & Karl. 2003). Based on data from 1932–2001, the County can anticipate 9-12 total hours of freezing rain per year (Changnon 2004).

Extent

The magnitude or severity of a severe winter storm depends on several factors, including a region's climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, time of occurrence during the day (for example, weekday versus weekend), and time of season. While sleet accumulation is measured and tracked in a method similar to snow

events, the extent or severity of freezing rain or an ice storm requires a different and sometimes more challenging process. According to NWS, ice accumulation does not coat the surface of an object evenly, as gravity typically forces rainwater to the underside of an object before it freezes. Wind can also force rainwater downward prior to freezing, resulting in a thicker coating of ice on one side of the object than the other side. Ice mass is then determined by taking the average from the thickest and thinnest portions of ice on the sample used for measurement.

NOAA's National Climatic Data Center (NCDC) produces the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two-thirds of the United States. The RSI ranks snowstorm impacts on a scale from Category 1 to 5, which is similar to the Enhanced Fujita scale for tornadoes or the Saffir-Simpson scale for hurricanes. RSI is based on the spatial extent of the storm, the amount of snowfall, and the combination of the extent and snowfall totals with population (based on the 2000 Census). The NCDC has analyzed and assigned RSI values to over 500 storms since 1900 (NOAA-NCEI 2018). Table 4.3.12-1 presents the five RSI ranking categories.

Table 4.3.12-1. RSI Ranking Categories

Category	Description	RSI Value
1	Notable	1-3
2	Significant	3-6
3	Major	6-10
4	Crippling	10-18
5	Extreme	18.0+

Source: NOAA-NCEI 2018
Note: RSI = Regional Snowfall Index

The NWS operates a widespread network of observing systems such as geostationary satellites, Doppler radars, and automated surface observing systems that feed into the current state-of-the-art numerical computer models to provide a look into what will happen next, ranging from hours to days. The models are then analyzed by NWS meteorologists who then write and disseminate forecasts (NWS 2013). While winter weather is normal during the winter season for Sussex County, the NWS uses winter weather watches, warnings, and advisories to help people anticipate what to expect in the days and hours prior to an approaching storm.

- A ***winter storm watch*** is issued when severe winter conditions (heavy snow, ice, etc.) may affect a certain area, but its occurrence, location, and timing are uncertain. A watch is issued to provide 24 to 72 hours of notice of the possibility of severe winter weather.
- A ***winter storm warning*** is issued when hazardous winter weather, in the form of heavy snow, heavy freezing rain, or heavy sleet, is imminent or occurring. A warning is usually issued 12 to 24 hours before the event is expected to begin.
- A ***winter weather advisory*** is issued when a hazardous winter weather event is occurring, is imminent, or has a greater than 80 percent chance of occurrence. Advisories are used to inform people that winter weather conditions are expected to cause significant inconveniences and that conditions may be hazardous. These conditions may refer to sleet, freezing rain, or ice storms, in addition to snow events.

NWS may also issue a ***blizzard warning*** when snow and strong winds combine to produce the potential for blinding snow, deep drifts, and wind chill (NWS n.d.).

Previous Occurrences and Losses

The NOAA NCEI Storm Events database records and defines severe winter storm events as follows:

- Blizzard is reported in the NOAA-NCEI database when a winter storm which produces the following conditions for 3 consecutive hours or longer: (1) sustained winds or frequent gusts 30 knots (35 mph) or greater, and (2) falling and/or blowing snow reducing visibility frequently to less than 1/4 mile.
- Heavy snow is reported in the NOAA-NCEI database whenever snow accumulation meets or exceed locally/regionally defined 12 and/or 24 hour warning criteria.
- Ice storm is reported in the NOAA-NCEI database when ice accretion meets or exceed locally/regionally defined warning criteria (typical value is 1/4 or 1/2 inch or more).
- Sleet is reported in the NOAA-NCEI database whenever sleet accumulations meet or exceed locally/regionally defined warning criteria (typical value is ½ inch or more).
- Winter storm is reported in the NOAA-NCEI database whenever a winter weather event has more than one significant hazard (i.e., heavy snow and blowing snow; snow and ice; snow and sleet; sleet and ice; or snow, sleet and ice) and meets or exceeds locally/regionally defined 12 and/or 24 hour warning criteria for at least one of the precipitation elements.
- Winter weather is reported in the NOAA-NCEI database when a winter precipitation event causes a death, injury, or a significant impact to commerce or transportation, but does not meet locally/regionally defined warning criteria.

Between 1954 and 2020, FEMA declared that the State of New Jersey experienced six winter storm-related disasters (DR) or emergencies (EM) classified as one or a combination of the following disaster types: severe winter storm, severe storm, snowstorm, blizzard, and ice conditions. Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. Sussex County was included in three of these declarations.

Agriculture-related drought disasters are quite common. The USDA Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. From 2015-2020, Sussex County was not included in any USDA disaster declarations for winter storm events (USDA 2020, USDA 2020a).

For this 2021 HMP update, winter weather events were summarized from 2015 to 2020. For information regarding severe winter weather events prior to 2015, refer to the Appendix E (Risk Assessment Supplement). For detailed information on damages and impacts to each municipality, refer to Section 9 (jurisdictional annexes).

Table 4.3.12-2. Winter Weather Related Disaster (DR) and Emergency (EM) Declarations 1954-2020

Declaration	Event Date	Declaration Date	Event Description
EM-3106	March 13-17, 1993	March 17, 1993	Severe Blizzard
DR-1088	January 7-12, 1996	January 13, 1996	Blizzard of 96 (Severe Snowstorm)
EM-3181	February 16-17, 2003	March 20, 2003	Snow

Source: FEMA 2020

Table 4.3.12-3. Severe Winter Weather Events in Sussex County, 2015 to 2020

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
January 24, 2015	Heavy Snow	N/A	N/A	Sussex County	A winter storm dropped heavy snow in Northwest New Jersey and a mixture of snow, sleet and freezing rain in the central and southwest part of New Jersey on the evening of the 23rd into the morning of the 24th. Overall less wintry precipitation (a faster switch to rain) occurred progressively farther to the south and southeast in the state. Snowfall averaged 5 to 9 inches in northwest New Jersey; 2 to 5 inches in central New Jersey and less than two inches across southwest New Jersey. No snow fell in southeast New Jersey. Ice accumulations were generally around a trace. The snow caused traveling difficulties as well as postponement of social activities on the 24th. There were over 100 reported accidents in the state. The snow and accidents caused about 2,000 homes and businesses to lose power. New Jersey Transit cross-honored all commuting tickets. The onshore flow from the winter storm also caused minor tidal flooding in southern New Jersey during the morning high tide cycle on the 24th. Precipitation started as snow on the evening of the 23rd from southwest New Jersey northward between 9 p.m. EST and Midnight EST. In Northwest New Jersey, the snow fell at its heaviest during the pre-dawn hours on the 24th and ended between 8 a.m. EST and 10 a.m. EST on the 24th. In the Raritan Valley, snow also fell at its heaviest during the pre-dawn hours on the 24th, but then changed to freezing rain and sleet between 4 a.m. EST and 6 a.m. EST on the 24th. Precipitation in some areas changed to plain rain before ending later that morning. In the central third of New Jersey, a change to rain (with some sleet at the transition time) worked its way to the northwest from coastal areas and occurred between 1 a.m. EST and 5 a.m. EST on the 24th and remained rain until it ended around 8 a.m. EST on the 24th. Throughout the state, about 20 high schools postponed SAT testing. Representative snowfall included 9.0 inches in Highland Lakes (Sussex County).
February 1-2, 2015	Winter Storm	N/A	N/A	Sussex County	A winter storm brought a heavy mixture of snow, some sleet and freezing rain to the Raritan Valley and northwest New Jersey with less of a wintry impact to the rest of central and southwest New Jersey on the first into the second. The storm greatly impacted the morning commute on the 2nd in the northwest part of the state. Precipitation started as snow throughout the northern half and southwest part of New Jersey during the evening of the 1st.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					Precipitation fell as rain in the southeast part of the state throughout the event. In southwest New Jersey, the snow transitioned briefly to sleet and then rain early on the 2nd. The rain briefly changed to snow before ending in the mid afternoon on the 2nd. In the Raritan Valley and in Mercer and Monmouth Counties, precipitation transitioned to rain during the early morning on the 2nd and then changed back to freezing rain, then sleet and ultimately snow during the second half of the morning and early afternoon. The snow ended during the mid afternoon on the 2nd. In northwest New Jersey including the Passaic Basin, the snow transitioned to a sleet and/or freezing rain mixture during the morning of the 2nd, then changed back to snow by early afternoon and ended during the middle of the afternoon on the 2nd. Speed restrictions were in place on most major roadways in central and northern New Jersey on the 2nd. Many schools in northwest New Jersey were closed on the 2nd. Representative snowfall included 8.0 inches in Montague (Sussex County).
January 22-24, 2016	Winter Storm	DR-4264	No	Sussex County	An impulse from the west coast traversed the midsection of the country, then developed into a low pressure system as it tracked across the Gulf states before intensifying along the Carolina coast into a major nor'easter, producing record snowfall in parts of New Jersey on January 23rd. It then moved out to sea after passing by the mid-Atlantic coast early on January 24th. Snow began falling during the Friday afternoon commute on January 22nd, then continued, heavy at times, Friday night into early Sunday morning. Wind gusts up to 60 MPH produced blizzard conditions as visibilities dropped to one-quarter mile or less in spots. Representative snowfall totals include 16.0 inches in Stockholm (Sussex).
November 20, 2016	Heavy Snow	N/A	N/A	Sussex County	An area of low pressure near James Bay Canada lead to a strong cold frontal passage across the middle Atlantic Saturday evening November 19. Northwesterly winds increased substantially immediately following the cold frontal passage, with several reports of gusts generally in the 45 to 55 mph range over New Jersey. These strong wind gusts persisted around 48 hours, through Monday November 21. The High Point, NJ mesonet site recorded a peak wind gust of 60 mph at 14:40EST on November 21. Following the cold frontal passage Saturday evening November 19, low pressure developed over New England, and provided a sufficiently cold and moist air mass to produce the seasons first significant snowfall. Snow overspread portions of the middle Atlantic late Saturday evening November 19, shortly after the cold frontal passage. By 01:00EST Sunday November 20, some of the higher terrain of northern New Jersey received around two inches of snowfall. The highest amount as of this time was 2.0 inches in Highland Lakes, New Jersey. The snow continued to fall into Sunday morning November 20. Around 08:00EST, amounts up to around 6 inches were observed across the higher terrain of Sussex county New Jersey.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
February 9, 2017	Winter Storm	N/A	N/A	Sussex County	A strong cold front moved through the region with a temperature drop from the 50's and 60's all the way down close to freezing. Low pressure developed along the front with precipitation northwest of the boundary. The precipitation changed to snow across most of the state. Northern locations had all snow with higher totals. Further south the precipitation was mainly rain for an extended period resulting in much lower accumulations. Gusty winds also occurred as the low departed the region. Some higher snowfall amounts include 11.1 inches in Highland Lakes, 10.3 inches in Wantage, 10.0 inches in Vernon, and 9.0 inches in Stockholm.
March 14, 2017	Blizzard	N/A	N/A	Sussex County	Low pressure systems across the Ohio Valley and Carolinas phased. This led to a rapidly developing storm which tracked just offshore. Wind and a foot of snow were reported across Sussex County.
January 17, 2018	Winter Storm	N/A	N/A	Sussex County	Several inches of snow fell across the northern portions of the state. Snowfall averaged around 6 inches of snow in Sussex county. Further south, across most of Northern Jersey totals ranged from 3-5 inches with totals closer to an inch in southern portions of the state. Several area schools closed due to the storm. A few hundred people also lost power in Sussex county. Snowfall averaged around 6 inches in the county.
March 2, 2018	Winter Storm	N/A	N/A	Sussex County	A heavy, wet snow accumulated to a depth of over 16 inches in the higher elevations of the county, and around 6 inches or so in the valleys. Some snowfall totals include 16.5 inches in Branchville, 14.0 inches in Highland Lakes, 13.5 inches at High Point, 8 inches near Wantage, 7.0 inches in Stockholm, and 2.3 inches near Sussex. A wind gust of 48 MPH was reported at High Point Monument at 1125EST on the 2nd. Blowing and drifting snow made travel hazardous Friday afternoon and evening. Numerous power outages, some lasting over two weeks, were widespread throughout the county due to tree and wire damage. Warming centers were established around the county for affected residents.
March 7, 2018	Winter Storm	DR-4368	No	Sussex County	Narrative A broad area of low pressure extending from the Ohio Valley to the Piedmont of South Carolina consolidated off the Virginia Capes during the early morning of March 7th. This new primary low moved northeast and gradually deepened as it passed east of the Delaware and New Jersey coasts on March 7th. The snow contained large amounts of liquid, making it heavy and wet. This resulted in downed trees, limbs, and wires, leading to numerous power outages across portions of New Jersey, especially where the heaviest snow was reported. Many customers were still without power from the previous storm when this storm struck. Governor Murphy estimated about 350,000 customers state-wide lost power as a result of this second storm. Although all portions of the county experienced significant snowfall from this event, the higher amounts occurred over the central and eastern portions of the county which were closer to the low pressure system. Some reported snowfall totals include: 21.0 inches in Highland Lakes, 17.0 inches in Stockholm, 16.0

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
					inches in Sparta, 15.5 inches in Hardyston Township, 15.0 inches in Vernon, 13.5 inches in Wantage, 12.7 inches in Montague, and 12.0 inches in Newton.
March 21-22, 2018	Winter Storm	N/A	N/A	Sussex County	A complex area of low pressure over the middle Atlantic, which involved several individual centers, slowly consolidated off the Virginia Capes Tuesday morning, March 20th into Wednesday March 21st along a frontal boundary. This primary low, the fourth nor'easter of March, gradually moved northeast Wednesday night, to a position southeast of the 40 North/70 West Benchmark coordinates on Thursday morning. Precipitation began as a wet, heavy snow during the evening hours on March 20th. After a lull during the overnight hours, a drier snow began falling, heavy at times, during the afternoon and evening hours on March 21st. The heaviest snow from this event fell in the southern one-half of the county, with a sharp drop off in the far north. Some snowfall reports include: 10.0 inches in both Stockholm and Byram Township, 9.5 inches in Fredon, 8.5 inches in both Hardyston Township and Newton, 7.0 inches in Ogdensburg, 7.0 inches in Andover, Sparta, and Franklin, 2.5 inches in Vernon Valley, 1.3 inches in Sussex, 1.1 inches in Wantage, and 0.2 inches in Montague.
April 2, 2018	Winter Storm	N/A	N/A	Sussex County	Despite high temperatures in the 50's and 60's across the region on April 1st, a cold front moving though the area during the morning gradually brought in colder air, which moved into the region by April 2nd. Meanwhile, a weak wave of low pressure developed along this front, and tracked south of the area. To the north of this low and where temperatures were cold enough, snow accumulated, especially near the Interstate 195 corridor and points north. The snow began after midnight on April 2nd and continued into the mid-morning hours. Snowfall amounts ranged from 4 to around 8 inches north of the Interstate 78 corridor. South of here, 1 to 4 inch amounts were common to the Interstate 195 corridor. To the south of the Interstate 195 corridor, amounts tapered down from 1 inch in a southerly direction, with Atlantic City New Jersey reporting a Trace of snowfall. A trained spotter reported 7.4 inches of snow in Highland Lakes. An NWS employee reported 5.5 inches of snow 4 miles southwest of Wantage.
November 15-16, 2018	Winter Storm	N/A	N/A	Sussex County	Early season winter storm. Additional trace amounts of snow were reported in Cape May County. Totals ranged from 12.6 in Montague to 6.5 in Sparta Township.

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
February 12-13, 2019	Winter Storm	N/A	N/A	Sussex County	This event was the second part of a multi-day storm that impacted the region with light snow changing to a wintry mix and then to rain. Snow and ice totals were less across Delmarva than other locations farther north and west. A trained spotter reported 3.0 of snow in Lebanon. 0.04 of ice was reported at the Sussex County Airport.
March 3-4, 2019	Winter Storm	N/A	N/A	Sussex County	An offshore low pressure system brought a period of heavy precipitation to the mid-Atlantic. A mix of rain, sleet, and snow was observed, with snow confined mainly to interior areas and sleet and rain more abundant near the coast. Snowfall totals inland approached 10, with snowfall rates exceeding one inch per hour for several hours. A sharp gradient in snowfall with a steep drop in snow totals was observed just west of the Interstate 95 corridor. A trained spotter in Highland Lakes reported 8.2 inches of snow.
December 1-3, 2019	Winter Storm	N/A	N/A	Sussex County	A complex, long duration winter storm impacted parts of the mid-Atlantic over the first three days of December. Impacts from the storm came mainly in two phases. Initially, weakening low pressure moved into the Midwest and Great Lakes region on December 1, bringing a widespread area of overrunning precipitation to the mid-Atlantic. Cold air in place ahead of the precipitation led to heavy mixed precipitation in interior areas, with most though not all areas eventually seeing a gradual change to rain. On December 2nd, developing secondary low pressure brought additional precipitation to the region, which took the form of rain changing to snow. The rapidly strengthening secondary low finally pulled away from the area during the early hours of December 3rd. A heavy mix of snow, sleet, and freezing rain occurred. The highest snowfall report was 14.3 inches in Highland Lakes, with a widespread 8 to 12 inches of snow throughout the county. Up to a third of an inch of glaze ice also fell. The Sussex Airport ASOS (KFWN) measured 0.32 inches of glaze ice. Widespread power outages occurred with a number of downed trees and wires, including the KFWN ASOS which failed late in the storm's duration due to loss of power.
December 16-17, 2019	Winter Storm	N/A	N/A	Sussex County	Low pressure developed along a stationary boundary over the Southeast US on December 16. The low pressure tracked into the Appalachians before beginning to develop near the southern New Jersey coast early on December 17. This brought widespread precipitation to the mid-Atlantic. Surface temperatures were initially cold enough for frozen precipitation in some areas, but a surge of low level warm air caused most of the frozen precipitation to fall as sleet and freezing rain, with most areas eventually seeing a change to all rain. In some places, impacts due to icing were significant. The Sussex, NJ Airport ASOS (KFWN) measured 0.44 inches of ice accretion. Some sleet also occurred. A number of reports of downed trees and power lines were received.

Source: NOAA-NCDC 2020; NJOEM 2019; NWS 2020; FEMA 2020
DR Disaster Declaration
FEMA Federal Emergency Management Agency
N/A Not Applicable

NCDC National Climatic Data Center
NOAA National Oceanic and Atmospheric Administration
NWS National Weather Service

Probability of Future Occurrences

Severe winter weather is a common occurrence each winter season in New Jersey. The majority of the State will receive at least one measurable snow event during the winter months. The months of January, February, March, April, October, November and December are typically when a vast majority of New Jersey has been observed to receive measurable snow. Generally, counties in the northern region experience more snow events than those in the southern region. It is estimated that Sussex County will continue to experience the direct and indirect impacts of severe winter weather events annually that many induce secondary hazards such as: structural damage (snow and ice load), wind damage, impact to life safety, disruption of traffic, loss of productivity, economic impact, loss of ability to evacuate, taxing first-responder capabilities, service disruption (power, water, etc.), and communication disruption.

According to the NOAA NCEI storm events database, Sussex County has been impacted by 135 severe winter storm events between 1950 and 2020 (Table 4.3.12-4). While no events resulted in deaths or crop damage, $3.65M in property damages and four injuries were reported.

Table 4.3.12-4. Probability of Future Occurrence of Severe Winter Weather Events

Hazard Type	Number of Occurrences Between 1950 and 2020	Annual Number of Events (average)	Recurrence Interval* (in years)	Probability of Event Occurring in Any Given Year	Percent Chance of Occurring in Any Given Year
Blizzard	2	0.03	35.5	0.03	2.8%
Heavy Snow	47	0.67	1.51	0.66	66.2%
Ice Storm	10	0.14	7.10	0.14	14.1%
Sleet	4	0.06	17.9	0.06	5.6%
Winter Storm	72	1.03	0.99	1.01	100%
Total	**135**	**1.9**	**0.53**	**1.90**	**100%**

Note: Not all events that have occurred in Sussex County are included due to the extent of documentation and the fact that not all sources have been identified or researched.
Source: NOAA-NCEI 2020

In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for severe winter weather in the county is considered 'frequent' (100 percent annual probability; a hazard event may occur multiple times per year, as presented in Table 4.4-1). The ranking of the severe winter weather hazard for individual municipalities is presented in the jurisdictional annexes.

Climate Change Impacts

Climate change includes major changes in temperature, precipitation, or wind patterns, which occur over several decades or longer. Due to the increase in greenhouse gas concentrations since the end of the 1890s, New Jersey has experienced a 3.5° F (1.9° C) increase in the State's average temperature (Office of the New Jersey State Climatologist 2020), which is faster than the rest of the Northeast region (2° F [1.1° C]) (Melillo et al. 2014) and the world (1.5° F [0.8° C]) (IPCC 2014). This warming trend is expected to continue. By 2050, temperatures in New Jersey are expected to increase by 4.1 to 5.7° F (2.3° C to 3.2° C) (Horton et al. 2015). Thus, New Jersey

can expect to experience an average annual temperature that is warmer than any to date (low emissions scenario) and future temperatures could be as much as 10° F (5.6° C) warmer (high emissions scenario) (Runkle et al. 2017). New Jersey can also expect that by the middle of the 21st century, 70% of summers will be hotter than the warmest summer experienced to date (Runkle et al. 2017). The increase in temperatures is expected to be felt more during the winter months (December, January, and February), resulting in less intense cold waves, fewer sub-freezing days, and less snow accumulation.

As temperatures increase, Earth's atmosphere can hold more water vapor which leads to a greater potential for precipitation. Currently, New Jersey receives an average of 46 inches of precipitation each year (Office of the New Jersey State Climatologist 2020). Since the end of the twentieth century, New Jersey has experienced slight increases in the amount of precipitation it receives each year, and over the last 10 years there has been a 7.9% increase. By 2050, annual precipitation in New Jersey could increase by 4% to 11% (Horton et al. 2015). By the end of this century, heavy precipitation events are projected to occur two to five times more often (Walsh et al. 2014) and with more intensity (Huang et al. 2017) than in the last century. New Jersey will experience more intense rain events, less snow, and more rainfalls (Fan et al. 2014, Demaria et al. 2016, Runkle et al. 2017).

Vulnerability Assessment

All of Sussex County is vulnerable to severe winter storm events. The following subsections discuss Sussex County's vulnerability, in a qualitative nature, to the severe winter weather hazard.

Impact on Life, Health and Safety

According to the NOAA National Severe Storms Laboratory (NSSL); every year, winter weather indirectly and deceptively kills hundreds of people in the U.S., primarily from automobile accidents, overexertion and exposure (NSSL 2020). Winter storms are often accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, drifting snow and extreme cold temperatures and dangerous wind chill. They are considered deceptive killers because most deaths and other impacts or losses are indirectly related to the storm. People can die in traffic accidents on icy roads, heart attacks while shoveling snow, or of hypothermia from prolonged exposure to cold. Heavy accumulations of ice can bring down trees and power lines, disabling electric power and communications for days or weeks. Heavy snow can immobilize a region and paralyze a city, shutting down all air and rail transportation and disrupting medical and emergency services. Storms near the coast can cause coastal flooding and beach erosion as well as sink ships at sea. The economic impact of winter weather each year is huge, with costs for snow removal, damage and loss of business in the millions (NOAA 2017).

The entire population of Sussex County (149,265 people) is exposed to severe winter storm events (U.S. Census, 2010). Snow accumulation and frozen/slippery road surfaces increase the frequency and impact of traffic accidents for the general population, resulting in personal injuries.

The homeless and residents below the poverty level may not have access to housing or their housing could be less able to withstand cold temperatures (e.g., homes with poor insulation and heating supply). Residents with low incomes might not have access to housing or their housing can be less able to withstand cold temperatures (e.g., homes with poor insulation and heating supply). In Sussex County, area with the highest concentration of population below the poverty level are located in Newton (10% of the total population). Refer to Section 3 (County Profile) that displays the densities of low-income populations in Sussex County.

Impact on General Building Stock

The entire general building stock inventory is exposed and vulnerable to the severe winter storm hazard. In general, structural impacts include damage to roofs and building frames, rather than building content. Current modeling tools are not available to estimate specific losses for this hazard. As an alternate approach, this plan

considers percentage damages that could result from severe winter storm conditions. Table 4.3.12-5 summarizes percent damages to buildings that could result from severe winter storm conditions. Given professional knowledge and the currently available information, the potential loss for this hazard is many times considered to be overestimated because of varying factors (building structure type, age, load distribution, building codes in place, etc.). Therefore, the following information should be used as estimates only for planning purposes with the knowledge that the associated losses for severe winter storm events vary greatly.

Table 4.3.12-5 General Building Stock Exposure and Estimated Losses from Severe Winter Storm Events

Municipality	Total (All Occupancies)	1% Damage Loss Estimate	5% Damage Loss Estimate	10% Damage Loss Estimate
Borough of Andover	$110,720,294	$1,107,202.94	$5,536,014.70	$11,072,029.40
Township of Andover	$797,432,934	$7,974,329.34	$39,871,646.70	$79,743,293.40
Borough of Branchville	$105,787,947	$1,057,879.47	$5,289,397.35	$10,578,794.70
Township of Byram	$1,001,139,850	$10,011,398.50	$50,056,992.50	$100,113,985.00
Township of Frankford	$1,028,566,798	$10,285,667.98	$51,428,339.90	$102,856,679.80
Borough of Franklin	$555,083,580	$5,550,835.80	$27,754,179.00	$55,508,358.00
Township of Fredon	$524,017,917	$5,240,179.17	$26,200,895.85	$52,401,791.70
Township of Green	$617,892,936	$6,178,929.36	$30,894,646.80	$61,789,293.60
Borough of Hamburg	$478,777,394	$4,787,773.94	$23,938,869.70	$47,877,739.40
Township of Hampton	$898,127,786	$8,981,277.86	$44,906,389.30	$89,812,778.60
Township of Hardyston	$1,058,804,064	$10,588,040.64	$52,940,203.20	$105,880,406.40
Borough of Hopatcong	$1,459,447,874	$14,594,478.74	$72,972,393.70	$145,944,787.40
Township of Lafayette	$484,326,532	$4,843,265.32	$24,216,326.60	$48,432,653.20
Township of Montague	$550,631,281	$5,506,312.81	$27,531,564.05	$55,063,128.10
Town of Newton	$926,551,970	$9,265,519.70	$46,327,598.50	$92,655,197.00
Borough of Ogdensburg	$250,464,374	$2,504,643.74	$12,523,218.70	$25,046,437.40
Township of Sandyston	$359,643,031	$3,596,430.31	$17,982,151.55	$35,964,303.10
Township of Sparta	$3,083,993,131	$30,839,931.31	$154,199,656.55	$308,399,313.10
Borough of Stanhope	$557,098,000	$5,570,980.00	$27,854,900.00	$55,709,800.00
Township of Stillwater	$581,254,607	$5,812,546.07	$29,062,730.35	$58,125,460.70
Borough of Sussex	$259,651,457	$2,596,514.57	$12,982,572.85	$25,965,145.70
Township of Vernon	$3,063,072,948	$30,630,729.48	$153,153,647.40	$306,307,294.80
Township of Walpack	$8,710,816	$87,108.16	$435,540.80	$871,081.60
Township of Wantage	$1,396,272,081	$13,962,720.81	$69,813,604.05	$139,627,208.10
Sussex County (Total)	**$20,157,469,603**	**$201,574,696.03**	**$1,007,873,480.15**	**$2,015,746,960.30**

Source: Sussex County GIS 2020; RS Means 2020
Values represent estimated replacement cost.

A specific area that is vulnerable to the severe winter storm hazard is the floodplain. Severe winter storms can cause flooding through blockage of streams or through snow melt. At-risk residential infrastructures are presented in the flood hazard profile (Section 4.3.5). Generally, losses resulting from flooding associated with severe winter storms should be less than that associated with a 100-year flood. Please refer to the Severe Weather (Section 4.3.11) profile for losses resulting from high winds which may also accompany severe winter weather.

Impact on Critical Facilities and Lifelines

Full functionality of critical facilities such as police, fire and medical facilities is essential for response during and after a severe winter storm event. These critical facility structures are largely constructed of concrete and masonry; therefore, they should only suffer minimal structural damage from severe winter storm events. Because power interruption can occur, backup power is recommended. Infrastructure at risk for this hazard includes roadways that could be damaged due to the application of salt and intermittent freezing and warming conditions that can damage roads over time. Severe snowfall requires the clearing roadways and alerting citizens to dangerous conditions; following the winter season, resources for road maintenance and repair are required.

Heavy snow can immobilize a region and paralyze a city, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces (NSSL 2020).

Impact on Economy

The cost of snow and ice removal and repair of roads from the freeze/thaw process can drain local financial resources. Another impact on the economy includes impacts on commuting into, or out of, the area for work or school. The loss of power and closure of roads prevents the commuter population traveling to work within and outside of the County. During the 2019-2020 winter season, the State of New Jersey Department of Transportation has budgeted winter maintenance expenditures at $36.9 million, which includes costs for salt (124,911 tons), liquid calcium chloride (247,424 gallons), and brine (270,820 gallons) (NJDOT 2020).

Impact on the Environment

Severe winter weather can have a major impact on the environment. Not only does winter weather create changes in natural processes, the residual impacts of a community's methods to maintain its infrastructure through winter weather maintenance may also have an impact on the environment. For example, an excess amount of snowfall and earlier warming periods may affect natural processes such as flow within water resources. Rain-on-snow events can also exacerbate runoff rates with warming winter weather. Consequentially, these flow rates and excess volumes of water can erode banks, tear apart habitat along the banks and coastline, and disrupt terrestrial plants and animals.

Furthermore, chemically based winter maintenance practices have its own effect on the natural environment. Melting snow and ice that carry deicing chemicals onto vegetation and into soils can contaminate the local waterways. Elevated salt levels may hinder vegetation from absorbing nutrients, slowing plant growth (UMass Extension 2020).

Future Growth and Development

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensure that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that can affect hazard vulnerability:

- Potential or projected development.
- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development

As discussed in Sections 3 and 9, areas targeted for future growth and development have been identified across Sussex County. Any areas of growth could be potentially impacted by the severe winter storm hazard because the entire planning area is exposed and vulnerable. However, due to increased standards and codes, new development may be less vulnerable to the severe winter weather hazard compared with the aging building stock in the County.

Projected Changes in Population

According to the 2018 5-year population estimates from the American Community Survey, the population of Sussex County (i.e., 142,298 persons) has decreased by approximately 4.7-percent since 2010. Even though the population has decreased, any changes in the density of population can create issues for local residents during evacuation of a severe winter storm event. Furthermore, if the density or number of persons over 65 increases in the County, more persons will be vulnerability to severe winter weather events. Refer to Section 3 (County Profile), which includes a discussion on population trends for the County.

Climate Change

Climate is defined not simply as average temperature and precipitation but also by the type, frequency and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the prevalence and severity of extremes such winter storms. While predicting changes of winter storm events under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society and the environment (U.S. Environmental Protection Agency [EPA], 2020).

Both northern and southern New Jersey have become wetter over the past century. In terms of long-term changes in snowfall and ice storms in New Jersey, there is a lack of quantitative data to predict how future climate change will affect this hazard. It is likely that the number of winter weather events may decrease, and the winter weather season may shorten; however, it is also possible that the intensity of winter storms may increase. The exact effect on winter weather is still highly uncertain.

An increase in the frequency and severity of severe winter storms could result in an increase of snow loads on the County's building stock and infrastructure, putting each building at risk to structural damage. More frequent and severe events also will result in increased resources spent to prepare for and clean-up after an event. However, as winter temperatures continue to rise, climate projections indicate the increase in precipitation is likely to occur during the winter months as rain. Increased rain on snowpack or frozen or saturated soils can lead to increased flooding and related impacts on the County's assets.

Change of Vulnerability

Overall, the County's exposure and vulnerability have not changed, and the entire County will continue to be exposed and vulnerable to severe winter storm events.

4.3.13 WILDFIRE

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the wildfire hazard in Sussex County.

2021 HMP Changes

- Previous occurrences were updated with events that occurred between 2015 and 2020.
- The vulnerability assessment was conducted using updated population, building and critical facility/lifeline spatial data to determine exposure to the wildfire hazard.

Profile

Hazard Description

A wildland fire can be defined as any non-structural fire that occurs in the wildland. Three distinct types of wildland fires have been defined and include: naturally occurring wildfire, human-caused wildfire, and prescribed fire. Many of these are highly destructive and can be difficult to control. They occur in forested, semi-forested, or less developed areas. Wildland fires can be caused by lightning, human carelessness, and arson. Most frequently, wildland fires in the State of New Jersey are caused by humans. Wildfires result in the uncontrolled destruction of forests, brush, field crops, grasslands, real estate, and personal property, and have secondary impacts on other hazards such as flooding, by removing vegetation and destroying watersheds.

Wildfires can increase the probability of other natural disasters, specifically floods and mudflows. Wildfires, particular large-scale fires, can dramatically alter the terrain and ground conditions, making land already devastated by fire susceptible to floods. Lands impacted by wildfire increase the risk of flooding and mudflow in those areas impacted by wildfire. Normally, vegetation absorbs rainfall, reducing runoff. However, wildfires leave the ground charred, barren, and unable to absorb water; thus, creating conditions perfect for flash flooding and mudflows. Flood risk in these impacted areas remain significantly higher until vegetation is restored, which can take up to five years after a wildfire (FEMA 2013).

Flooding after a wildfire is often more severe, as debris and ash left from the fire can form mudflows. During and after a rain event, as water moves across charred and denuded ground, it can also pick up soil and sediment and carry it in a stream of floodwaters. These mudflows have the potential to cause significant damage to impacted areas. Areas directly affected by fires and those located below or downstream of burn areas are most at risk for flooding (FEMA 2013). For detailed information regarding flooding, see Section 4.3.6 (Flood).

The height of wildland fire season in New Jersey is typically in spring (March through May) and culminates in early May, corresponding with the driest live fuel moisture periods of the year. Although the spring months are the most severe, the summer and fall months may also experience extensive fires in the state. While the spring season is historically the period in which wildfire danger is the highest, wildland fires can occur every month of the year. Drought, snow pack, and local weather conditions can expand the length of the fire season. The early and late shoulders of the fire season usually are associated with human-caused fires. Lightning generally is the cause of most fires in the peak season.

Location

According to the U.S. Fire Administration (USFA), the fire problem in the U.S. varies from region to region. This often is a result of climate, poverty, education, demographics, and other causal factors (USFA 2012). In Sussex County, wildfires have the potential to occur anywhere in the County.

The New Jersey Forest Fire Service (NJFFS), a division of the New Jersey Department of Environmental Protection (NJDEP), is responsible for protecting the 3.25 million acres of wildland in the State. NJFFS is under the direction of the State fire warden and is headquartered in Trenton. NJFFS has 85 full-time employees that provide an array of services including staffing the State's 21 fire towers, which are operational during the months of March, April, May, October, and November.

NJFFS divides the State into three regions (Northern, Central, Southern) each totaling about 1,250,000 acres. There are 29 125,000 acre sections with a dedicated forest fire warden in each; and 269 districts each consisting of 15,000-20,000 acres In total, 29 section forest fire wardens, 269 district forest fire wardens and 2,000 trained crew members respond to fires on an as-needed basis (NJFFS 2013). Figure 4.3.13-1 illustrates the NJFFS region divisions within the State. Sussex County is located in Division A (Northern NJ).

Wildfire Fuel Hazard Areas

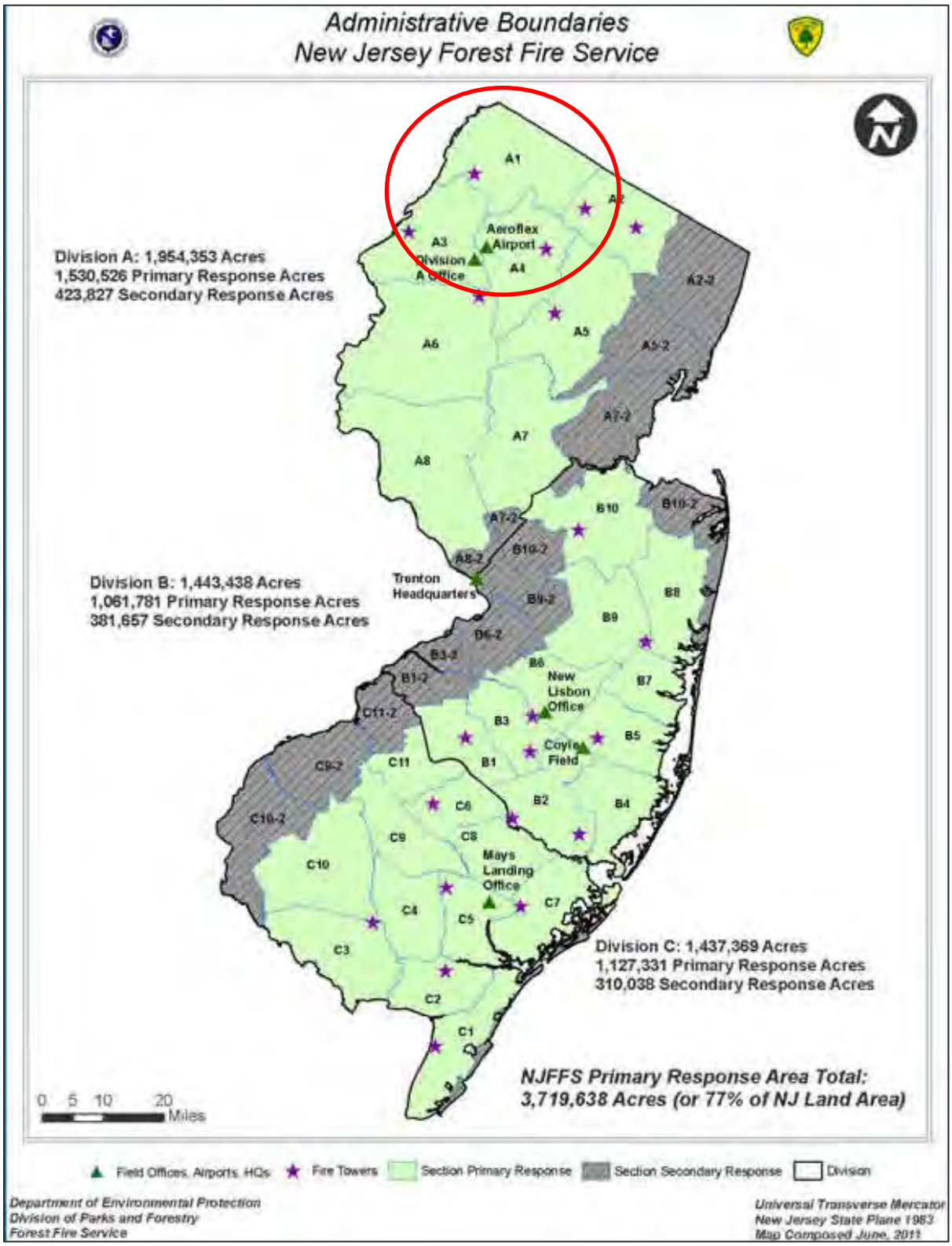
NJFFS developed Wildfire Fuel Hazard data for the entire state based on NJDEP data. For details on the information was developed, refer to: https://www.state.nj.us/dep/gis/njfh.html. Refer to Figure 4.3.13-2 for the fuel hazards located in Sussex County; and Figure 4.3.13-3 for the fire risk in Sussex County. Every municipality in Sussex County has at least a small portion of the community located within the high to extreme risk area, with Township of Walpack having largest percentage of land within the high to extreme risk area (29.8-percent) due to the large areas of parkland. Table 4.3.13-1 summarizes the amount of land in each of the wildfire fuel hazard ranking zones for Sussex County. Table 4.3.13-2 summarizes the approximate area in the NJFFS risk areas in the County.

Table 4.3.13-1. Area in the Wildfire Fuel Hazard Ranking Zones in Sussex County

Hazard Area	Area (Square Miles)
Extreme	32.1
Very High	11.8
High	25.6
Moderate	98.3
Low	248.6

Source: NJDEP 2009

Figure 4.3.13-1. Fire Divisions of New Jersey



Source: *NJDEP 2013*

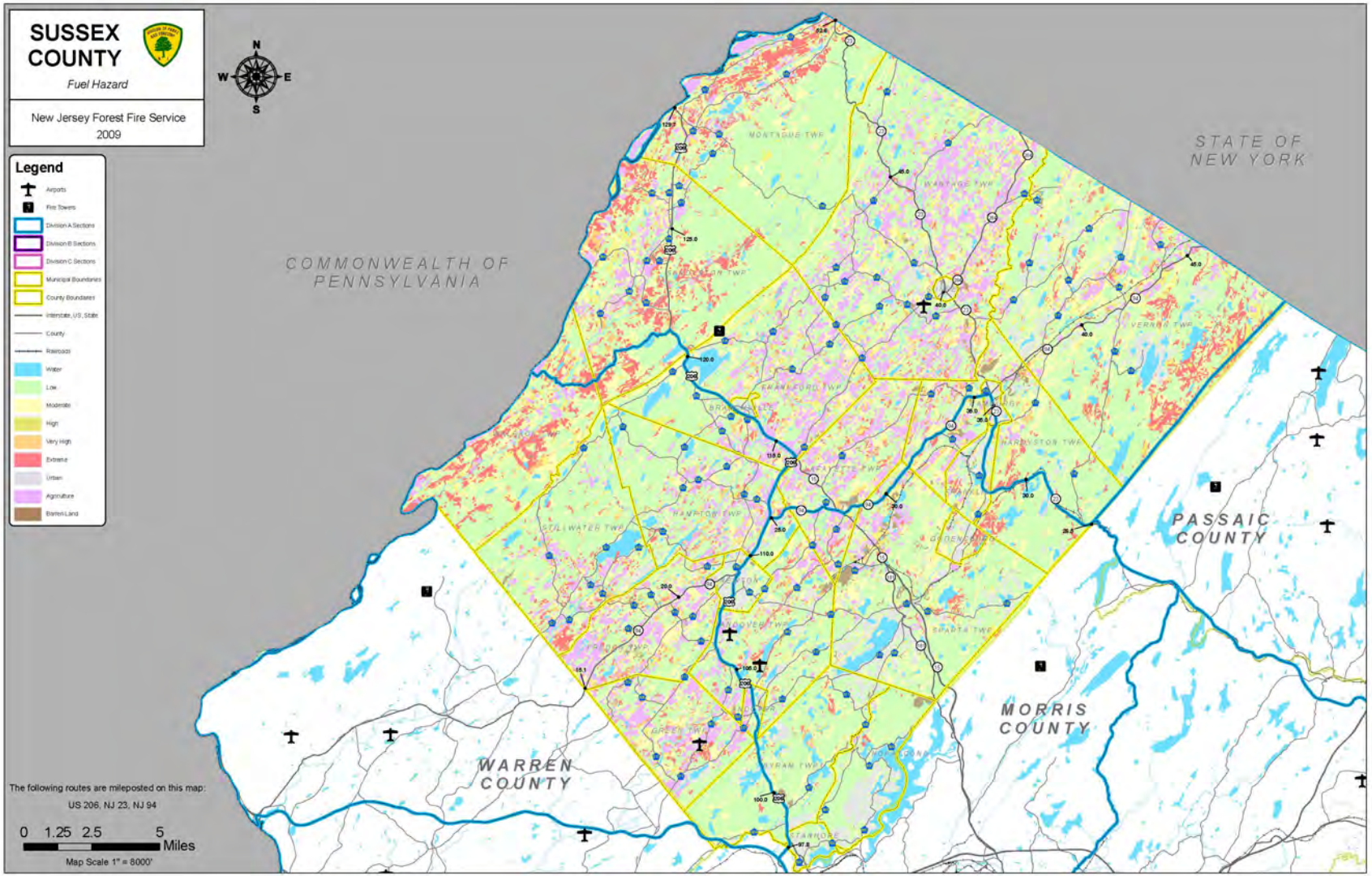
Note: *The red circle indicates the location of Sussex County. The County is located in Fire Division A.*

Table 4.3.13-2. Approximate Area in Wildfire Fuel Hazard Ranking Zones in Sussex County

Municipality	Total Area (Square Miles)	New Jersey Forest Fire Service Risk Areas			
		Low to Moderate	Percent in Hazard Area	High to Extreme	Percent in Hazard Area
Andover (B)	1.4	0.7	48.0%	0.1	8.9%
Andover (Twp)	20.8	13.5	64.9%	2.3	10.9%
Branchville (B)	0.6	0.2	38.3%	0.0	5.3%
Byram (Twp)	22.7	17.7	78.1%	0.8	3.5%
Frankford (Twp)	35.3	21.1	59.7%	3.9	11.0%
Franklin (B)	4.4	2.0	45.9%	0.6	14.1%
Fredon (Twp)	17.9	10.0	55.9%	2.6	14.5%
Green (Twp)	16.3	9.0	55.1%	2.1	12.6%
Hamburg (B)	1.2	0.3	28.8%	0.1	10.5%
Hampton (Twp)	25.5	16.8	66.1%	2.4	9.6%
Hardyston (Twp)	32.6	23.4	71.8%	3.8	11.7%
Hopatcong (B)	12.4	7.2	57.9%	0.2	1.5%
Lafayette (Twp)	18.0	9.5	52.9%	2.5	13.9%
Montague (Twp)	46.6	34.7	74.5%	6.7	14.5%
Newton (T)	3.4	1.5	44.8%	0.1	3.5%
Ogdensburg (B)	2.2	1.0	46.5%	0.5	20.1%
Sandyston (Twp)	42.1	27.7	65.9%	9.9	23.6%
Sparta (Twp)	38.8	25.6	65.9%	2.9	7.6%
Stanhope (B)	2.1	1.0	49.0%	0.0	1.0%
Stillwater (Twp)	28.2	19.9	70.4%	3.0	10.7%
Sussex (B)	0.6	0.1	22.4%	0.0	1.3%
Vernon (Twp)	70.0	46.4	66.3%	10.7	15.2%
Walpack (Twp)	24.9	15.3	61.2%	7.4	29.8%
Wantage (Twp)	67.5	40.8	60.5%	6.2	9.2%
Sussex County (Total)	**535.5**	**345.6**	**64.5%**	**68.9**	**12.9%**

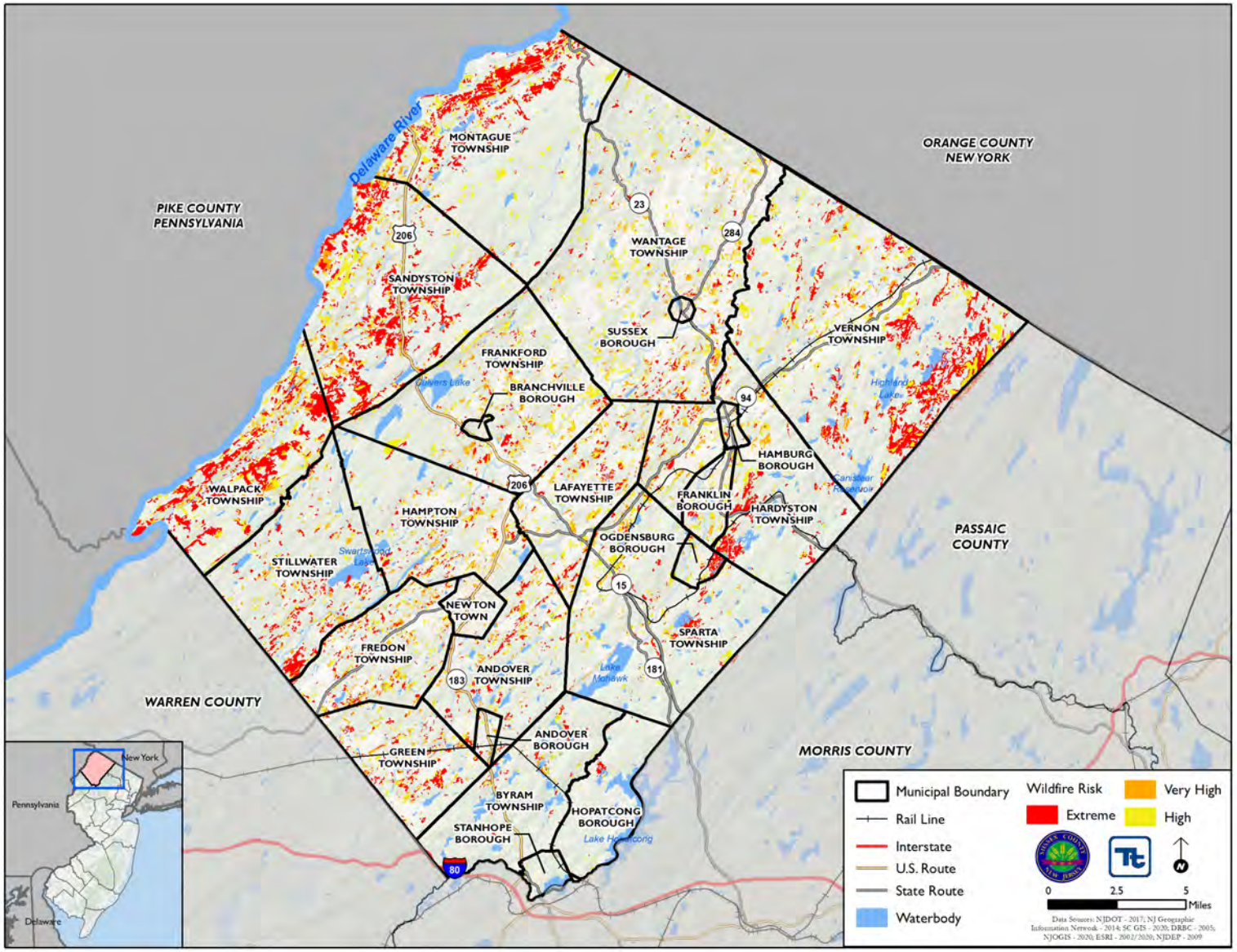
Source: NJDEP 2009
Note: B – Borough; T – Town; Twp – Township; % - Percent

Figure 4.3.13-2. Wildfire Fuel Hazard for Sussex County



Source: New Jersey Forest Fire Service 2009

Figure 4.3.13-3. Wildfire Risk for Sussex County as Defined by NJFFS



Extent

The extent (that is, magnitude or severity) of wildfires depends on weather (dryness/drought) and human activity. To determine the potential for wildfires, the NJFFS uses two indices to measure and monitor the dryness of forest fuels and the possibility of fire ignitions becoming wildfires. This includes the National Fire Danger Rating Systems Buildup Index and the Keetch-Byram Drought Index. Both are used for fire preparedness planning, which includes the following initiatives: campfire and burning restrictions, fire patrol assignments, staffing of fire lookout towers, and readiness status for both observation and firefighting aircraft.

- The ***Buildup Index*** is a number that reflects the combined cumulative effects of daily drying and precipitation fuels with a 10-day time lag constant. It is a rating of the total amount of fuel available for combustion.
- The ***Keetch-Byram Drought Index*** (KBDI) is an index used to determining forest fire potential. The drought index is based on a daily water balance, where a drought factor is balanced with precipitation and soil moisture (assumed to have a maximum storage capacity of 8-inches) and is expressed in hundredths of an inch of soil moisture depletion.

In addition to the two indices, the NJFFS uses the National Fire Danger Rating System (NFDRS) to provide a measure of relative seriousness of burning conditions and threat of fire in the State. It allows the NJFFS to estimate the daily fire danger for a given area. The NFDRS uses a five-color coded system to help the public understand fire potential. The NJFFS slightly adapted the color system for their purposes. The NFDRS, with the NFFS color scheme, is as follows in Table 4.3.13-3:

Table 4.3.13-3. Fire Danger Rating and Color Code

Fire Danger Rating and Color Code	Description
Low (L) (Green)	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but woods fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.
Moderate (M) (Blue)	Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open-cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
High (H) (Yellow)	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Very High (VH) (Orange)	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high-intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
Extreme (E) (Red)	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high-intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash (trunks, branches, and tree tops) or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.

Source: NJFFS 2020

Previous Occurrences and Losses

According to the NJ State Forestry, for 2019, 77 wildfires have occurred in Sussex County with an average size of 7.5 acres. Roughly 50 fires have threatened homes or other buildings. The NJ State Forestry has also responded to roughly 150 other incidents responses (SARs, Open Burns, IMT assignments, Storm Responses).

Between 1954 and 2020, New Jersey was included in two FEMA fire management assistance (FMA) declarations. Generally, these disasters cover a wide range of the State; therefore, the disaster may have impacted many counties. Sussex County was not included in either FEMA FMA declaration.

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2020, Sussex County was not included in any USDA disaster declarations.

Major wildfire events that have impacted Sussex County between 2015 and 2020 are identified in Tables 4.3.13-4. With severe weather documentation for New Jersey and Sussex County being so extensive, not all sources have been identified or researched. Please see Section 9 (Jurisdictional Annexes) for detailed information regarding impacts and losses to each municipality.

Table 4.3.13-4. Flooding Events in Sussex County, 2015 to 2020

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Sussex County Designated?	Location	Description
May 12, 2015	Wildfire	N/A	N/A	Montague Twp	A wildfire destroyed a home on Doremus Lane in Montague Township in Sussex County on the 12th. The wildfire started shortly after 530 p.m. EDT on the 12th. In addition to the home being destroyed, the wildfire consumed more than 6 acres before it was brought under control shortly after 8 p.m. EDT on the 12th. May 12th was an unseasonably warm and windy day which made it easy for wildfires to spread more rapidly. The peak wind gust at Wantage was 40 mph and the minimum relative humidity was 22 percent. No serious injuries were reported.

Source: *FEMA 2020; NOAA-NCEI 2020; NJOEM 2019*
Note: *Not all events that have occurred in Sussex County are included due to the extent of documentation and the fact that not all sources have been identified or researched.*
K: Thousand
DR *Disaster Declaration (FEMA)*
FEMA *Federal Emergency Management Agency*
Mph *miles per hour*
N/A *Not Applicable*

Probability of Future Occurrences

Estimating the approximate number of wildfires to occur in Sussex County is difficult to predict in a probabilistic manner. This is because a number of variable factors impact the potential for a fire to occur and because some conditions (for example, ongoing land use development patterns, location, fuel sources, and construction sites) exert increasing pressure on the wildfire urban interface (WUI). Based on available data, urban fires and wildfires will continue to present a risk to Sussex County. Given the numerous factors that can impact urban

fire and wildfire potential, the likelihood of a fire event starting and sustaining itself should be gauged by professional fire managers on a daily basis.

According to the NOAA NCEI, Sussex County experienced 12 wildfire events between 1950 and 2020. The table below shows these statistics, as well as the annual average number of events and the percent chance of the wildfire occurring in Sussex County in future years (NOAA NCEI 2020).

Table 4.3.13-5. Probability of Future Occurrence of Wildfire Events

Hazard Type	Number of Occurrences Between 1950 and 2020	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	Percent chance of occurrence in any given year
Wildfire	12	0.17	5.9	0.17	16.9%

Source: NOAA-NCEI 2020

In Section 4.4, the identified hazards of concern for Sussex County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Partnership, the probability of occurrence for wildfire in the County is considered 'occasional' (between 10 and 100 percent annual probability of a hazard event occurring., as presented in Table 4.4-1) with major impacts. The ranking of the wildfire hazard for individual municipalities is presented in the jurisdictional annexes.

Climate Change Impacts

A gradual change in temperatures will alter the growing environment of many tree species throughout the United States and New Jersey, reducing the growth of some trees and increasing the growth of others. Tree growth and regeneration may be affected more by extreme weather events and climatic conditions than by gradual changes in temperature or precipitation. Warmer temperatures may lead to longer dry seasons and multi-year droughts, creating triggers for wildfires, insects, and invasive species. Increased temperature and change in precipitation will also affect fuel moisture during wildfire season and the length of time during while wildfires can burn during a given year (U.S. Department of Agriculture [USDA] 2012). Climate change may also increase the frequency of lightning strikes. A warmer atmosphere holds more moisture which is one of the key items for triggering a lightning strike. Lightning strikes cause approximately half the wildfires in the United States. If the frequency of lightning strikes increases, the potential for wildfires from these strikes also increases (Lee 2014). Wildfire incidents are predicted to increase throughout the United States due to climate change, causing at least a doubling of areas burned within the next century (USDA 2012).

According to the temperature projections for Northern New Jersey, including Sussex County, this area can expect warmer and drier conditions which may increase the frequency and intensity of wildfires. Higher temperatures are expected to increase the amount of moisture that evaporates from land and water. These changes have the potential to lead to more frequent and severe droughts, which, in turn, increases the likelihood of wildfires (U.S. EPA 2009).

Vulnerability Assessment

A spatial analysis was conducted using the 2009 NJDEP Wildfire Fuel Hazard spatial layer**.** For the purposes of the assessment, an asset **(**population, structures, critical facilities, and lifelines) is considered exposed and potentially vulnerable to the wildfire hazard if it is located in the 'extreme', 'very high' and 'high' wildfire fuel

hazard areas. Refer to Section 4.2 (Methodology and Tools) for additional details on the methodology used to assess wildfire risk.

Impact on Life, Health, and Safety

Wildfires have the potential to impact human health and life of residents and responders, structures, infrastructure, and natural resources. The most vulnerable populations include emergency responders and those within a short distance of the interface between the built environment and the wildland environment. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke. Table 4.3.13-6 summarizes the estimated population exposed to the wildfire hazard by municipality.

Based on the analysis, an estimated 2,933 residents, or 2.1-percent of the County's population, live in the extreme, high, and very high wildfire fuel hazard areas. Overall, the Township of Hardyston has the greatest number of individuals located in the extreme, very high, and high fuel hazard areas (i.e., 525 persons).

Of the population exposed, the most vulnerable include the economically disadvantaged and the population over age 65. In Sussex County, there are 7,191 persons living below the poverty level and 22,889 persons over 65 years old. Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on net economic impacts on their families. The population over age 65 is also more vulnerable because they are more likely to seek or need medical attention that may not be available due to isolation during a wildfire event, and they may have more difficulty evacuating.

Table 4.3.13-6. Population in Wildfire Fuel Hazard Areas

Jurisdiction	Total Population	Population Exposure to The Wildfire Fuel Hazard Area (Extreme High, Very High, High)	
		Number of People	Percent of Total
Andover (B)	594	0	0.0%
Andover (Twp)	5,996	117	2.0%
Branchville (B)	896	5	0.6%
Byram (Twp)	8,010	29	0.4%
Frankford (Twp)	5,361	121	2.3%
Franklin (B)	4,807	32	0.7%
Fredon (Twp)	3,214	156	4.9%
Green (Twp)	3,495	127	3.6%
Hamburg (B)	3,152	175	5.6%
Hampton (Twp)	4,916	53	1.1%
Hardyston (Twp)	7,886	525	6.7%
Hopatcong (B)	14,362	24	0.2%
Lafayette (Twp)	2,390	47	2.0%
Montague (Twp)	3,716	258	7.0%
Newton (T)	7,895	4	0.0%
Ogdensburg (B)	2,314	28	1.2%
Sandyston (Twp)	1,925	97	5.0%

Jurisdiction	Total Population	Population Exposure to The Wildfire Fuel Hazard Area (Extreme High, Very High, High)	
		Number of People	Percent of Total
Sparta (Twp)	18,841	273	1.4%
Stanhope (B)	3,377	0	0.0%
Stillwater (Twp)	3,936	108	2.7%
Sussex (B)	1,854	7	0.4%
Vernon (Twp)	22,369	326	1.5%
Walpack (Twp)	6	0	0.0%
Wantage (Twp)	10,986	419	3.8%
Sussex County (Total)	**142,298**	**2,933**	**2.1%**

Source: American Community Survey 2018 5-year estimates; NJDEP 2009
Note: B – Borough; T – Town; Twp – Township; % - Percent

Impact on General Building Stock

Buildings located within the NJFFS identified extreme, very high or high fuel hazard areas are exposed and considered vulnerable to the wildfire hazard. Buildings constructed of wood or vinyl siding are generally more likely to be impacted by the fire hazard than buildings constructed of brick or concrete. Table 4.3.13-7 summarizes the estimated building stock inventory located in the defined hazard area by municipality. Approximately 3.7-percent ($2.2 million) of the County's building replacement cost value is located in the extreme/very high/high hazard area. The Township of Hardyston has the greatest number of buildings located in the wildfire hazard area (277 structures – 6.3-percent of its total).

Table 4.3.13-7. Probability of Future Occurrence of Wildfire Events

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposed to The Wildfire Fuel Hazard Area (Extreme High, Very High, High)			
			Number of Buildings	Percent of Total	Replacement Cost Value (RCV)	Percent of Total
Andover (B)	328	$628,463,030	0	0.0%	$0	0.0%
Andover (Twp)	2,584	$3,609,679,724	53	2.1%	$96,760,223	2.7%
Branchville (B)	426	$532,377,368	2	0.5%	$954,087	0.2%
Byram (Twp)	3,676	$2,746,550,446	18	0.5%	$14,547,815	0.5%
Frankford (Twp)	3,537	$3,129,888,305	85	2.4%	$213,384,750	6.8%
Franklin (B)	2,061	$1,921,211,856	12	0.6%	$4,979,832	0.3%
Fredon (Twp)	1,615	$1,372,050,934	66	4.1%	$44,807,505	3.3%
Green (Twp)	1,698	$1,598,635,804	56	3.3%	$89,473,403	5.6%
Hamburg (B)	1,594	$1,588,049,291	83	5.2%	$30,256,179	1.9%
Hampton (Twp)	2,763	$2,196,131,598	38	1.4%	$43,529,892	2.0%
Hardyston (Twp)	4,403	$3,183,033,542	277	6.3%	$150,248,545	4.7%
Hopatcong (B)	8,040	$2,888,571,676	17	0.2%	$5,875,484	0.2%
Lafayette (Twp)	1,462	$1,958,174,065	27	1.8%	$33,525,478	1.7%

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value (RCV)	Estimated Building Stock Exposed to The Wildfire Fuel Hazard Area (Extreme High, Very High, High)			
			Number of Buildings	Percent of Total	Replacement Cost Value (RCV)	Percent of Total
Montague (Twp)	2,175	$1,459,611,020	141	6.5%	$145,007,235	9.9%
Newton (T)	2,679	$5,093,275,807	5	0.2%	$38,880,823	0.8%
Ogdensburg (B)	992	$819,879,629	12	1.2%	$4,826,290	0.6%
Sandyston (Twp)	1,528	$1,212,626,664	67	4.4%	$83,899,043	6.9%
Sparta (Twp)	8,132	$9,070,094,285	143	1.8%	$743,896,647	8.2%
Stanhope (B)	1,557	$1,051,183,581	1	0.1%	$33,458	<0.1%
Stillwater (Twp)	2,493	$1,417,579,398	64	2.6%	$20,291,206	1.4%
Sussex (B)	678	$1,945,578,916	2	0.3%	$1,326,154	0.1%
Vernon (Twp)	12,039	$5,658,971,163	182	1.5%	$248,943,139	4.4%
Walpack (Twp)	51	$63,691,550	8	15.7%	$20,753,211	32.6%
Wantage (Twp)	5,510	$4,877,543,885	198	3.6%	$192,791,167	4.0%
Sussex County (Total)	**72,021**	**$60,022,853,539**	**1,557**	**2.2%**	**$2,228,991,567**	**3.7%**

Source: Sussex County GIS 2020; RS Means 2020; NJDEP 2009
Note: B – Borough; T – Town; Twp – Township; % - Percent

Impact on Critical Facilities and Lifelines

In Sussex County, there are 22 critical facilities and lifelines located in the wildfire hazard area. Township of Sparta has the greatest number of critical facilities exposed to the wildfire fuel hazard areas (74). Refer to Table 4.3.13-8 which summarizes the number of exposed critical facilities and lifelines by jurisdiction.

Additionally, Table 4.3.13-9 summarizes the distribution of critical facilities exposed to the wildfire fuel hazard area. The majority of critical facilities exposed to the wildfire fuel hazard area are dams (i.e. 14). Additionally, most of the critical facilities exposed to the wildfire hazard area are categorized as safety and security lifelines for the County. As mentioned previously, wildfires can have an impact on the water supplies throughout the County because of residual pollutants like char or debris landing in water resources which can clog wastewater pipes, culverts, etc.

Table 4.3.13-8. Estimated Number of Critical Facilities and Lifelines Located in the Wildfire Fuel Hazard Area

Jurisdiction	Total Critical Facilities and Lifelines Located in Jurisdiction	Wildfire Fuel Hazard Area (Extreme High, Very High, High)	
		Critical Facilities and Lifelines	Percent of Total Critical Facilities and Lifelines
Andover (B)	12	1	8.3%
Andover (Twp)	37	1	2.7%
Branchville (B)	4	0	0.0%
Byram (Twp)	37	2	5.4%
Frankford (Twp)	23	0	0.0%
Franklin (B)	10	0	0.0%

Jurisdiction	Total Critical Facilities and Lifelines Located in Jurisdiction	Wildfire Fuel Hazard Area (Extreme High, Very High, High)	
		Critical Facilities and Lifelines	Percent of Total Critical Facilities and Lifelines
Fredon (Twp)	17	2	11.8%
Green (Twp)	21	0	0.0%
Hamburg (B)	19	0	0.0%
Hampton (Twp)	20	1	5.0%
Hardyston (Twp)	27	2	7.4%
Hopatcong (B)	22	0	0.0%
Lafayette (Twp)	14	0	0.0%
Montague (Twp)	32	1	3.1%
Newton (T)	39	0	0.0%
Ogdensburg (B)	7	1	14.3%
Sandyston (Twp)	28	2	7.1%
Sparta (Twp)	74	5	6.8%
Stanhope (B)	7	0	0.0%
Stillwater (Twp)	24	0	0.0%
Sussex (B)	8	0	0.0%
Vernon (Twp)	74	3	4.1%
Walpack (Twp)	11	0	0.0%
Wantage (Twp)	29	1	3.4%
Sussex County (Total)	**596**	**22**	**3.7%**

Source: Sussex County GIS 2020; NJDEP 2009
Note: B – Borough; T – Town; Twp – Township; % - Percent

Table 4.3.13-9. Distribution of Critical Facilities Located in the Wildfire Fuel Hazard Area by Type

Jurisdiction	Facility Types								
	Dam	DPW	Government Building	Hazardous Material Facility	Health/Medical Center	Potable Pump Station	Secondary Education	Wastewater Treatment	Well
Andover (B)	1	0	0	0	0	0	0	0	0
Andover (Twp)	1	0	0	0	0	0	0	0	0
Branchville (B)	0	0	0	0	0	0	0	0	0
Byram (Twp)	2	0	0	0	0	0	0	0	0
Frankford (Twp)	0	0	0	0	0	0	0	0	0
Franklin (B)	0	0	0	0	0	0	0	0	0
Fredon (Twp)	2	0	0	0	0	0	0	0	0
Green (Twp)	0	0	0	0	0	0	0	0	0

Jurisdiction	Facility Types								
	Dam	DPW	Government Building	Hazardous Material Facility	Health/Medical Center	Potable Pump Station	Secondary Education	Wastewater Treatment	Well
Hamburg (B)	0	0	0	0	0	0	0	0	0
Hampton (Twp)	1	0	0	0	0	0	0	0	0
Hardyston (Twp)	0	0	1	0	1	0	0	0	0
Hopatcong (B)	0	0	0	0	0	0	0	0	0
Lafayette (Twp)	0	0	0	0	0	0	0	0	0
Montague (Twp)	0	0	0	0	0	0	0	0	1
Newton (T)	0	0	0	0	0	0	0	0	0
Ogdensburg (B)	1	0	0	0	0	0	0	0	0
Sandyston (Twp)	2	0	0	0	0	0	0	0	0
Sparta (Twp)	1	1	0	0	0	1	1	1	0
Stanhope (B)	0	0	0	0	0	0	0	0	0
Stillwater (Twp)	0	0	0	0	0	0	0	0	0
Sussex (B)	0	0	0	0	0	0	0	0	0
Vernon (Twp)	3	0	0	0	0	0	0	0	0
Walpack (Twp)	0	0	0	0	0	0	0	0	0
Wantage (Twp)	0	0	0	1	0	0	0	0	0
Sussex County (Total)	**14**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

Source: Sussex County GIS 2020; NJDEP 2009
Note: B – Borough; T – Town; Twp – Township

Table 4.3.13-10. Estimated Number of Lifelines Located in the Wildfire Fuel Hazard Area

FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Exposed to The Wildfire Fuel Hazard Area (Extreme High, Very High, High)
Communications	9	0
Energy	12	0
Food, Water, Shelter	75	3
Hazardous Materials	20	1
Health and Medical	15	1
Safety and Security	463	17
Transportation	2	0
Sussex County (Total)	**596**	**22**

Source: Sussex County GIS 2020; NJDEP 2009; FEMA 2020

As mentioned previously, wildfires can have an impact on the water supplies throughout the County because of residual pollutants like char or debris landing in water resources which can clog wastewater pipes, culverts, etc.

Wildfires may also impact transportation routes, blocking residents and commuters from getting in and out of the County during a wildfire event because of char and debris polluting the air making it difficult to drive, or the flames having close proximity to the roadways making the route an unsafe passageway. Table 4.3.13-11 summarizes the number of miles roadways are built in the wildfire fuel hazard areas. Overall, 8.4-percent of the major roadways in the County are built within the wildfire fuel hazard area. Roads and bridges surrounding the areas of fire risk are important because they provide ingress and egress to large areas and, in some cases, to isolated neighborhoods. Fires can create conditions that block or prevent access and can isolate residents and emergency service providers

Table. 4.3.13-11. Major Transportation Routes Exposed to the Wildfire Fuel Hazard Areas

Road Type	Total Miles for County	Roadway Miles Exposed to the Wildfire Hazard Areas	
		Miles	Percent of Total
Local and Private Roads	1,337	103	7.7%
County Roads	313	33	10.6%
State Routes	86	8	9.2%
US Highways	34	4	11.9%
Interstate	1	0	0.0%
Sussex County (Total)	**1,771**	**148**	**8.4%**

Source: Sussex County GIS 2020; NJDEP 2009, NJDOT 2019

Impact on the Economy

Wildfire events can have major economic impacts on a community from the initial loss of structures and the subsequent loss of revenue from destroyed business. These events may cost thousands of taxpayer dollars to suppress and control and may involve hundreds of operating hours on fire apparatus and thousands of volunteer man hours from the volunteer firefighters. There are also many direct and indirect costs to local businesses that excuse volunteers from working to fight these fires.

Due to a lack of data regarding past structural and economic losses specific to Sussex County or its municipalities, it is not possible to estimate future losses due to wildfire events currently.

Impact on the Environment

According to the USGS, post-fire runoff polluted with debris and contaminates can be extremely harmful to ecosystem and aquatic life (USGS 2018). Studies show that urban fires in particular are more harmful to the environment compared to forest fires (USGS 2018). The age and density of infrastructure within Sussex County can exacerbate consequences of fires on the environment because of the increased amount of chemicals and contaminates that would be released from burning infrastructure. These chemicals, such as iron lead, and zinc, may leach into the storm water, contaminate nearby streams, and impair aquatic life.

Future Changes That May Impact Vulnerability

Understanding future changes that effect vulnerability in the County can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. Changes in the natural environment and built environment and how they interact can also provide insight about ways to plan for the future.

Projected Development

As discussed and illustrated in Section 3 (County Profile), areas targeted for future growth and development have been identified across the County. Any changes in development can impact the County's risk to the wildfire hazard of concern. Therefore, the County should implement wildfire management strategies in existing building code to protect structures against the residual impacts from wildfire such as heat, debris, and char. Furthermore, development should be built with access to transit routes that will enable easier evacuation during a wildfire event.

A spatial analysis was conducted to determine the intersection of potential new development identified by municipalities and the wildfire hazard area. The exposure analysis shows that nine of these new development locations will be built in wildfire hazard areas; refer to Figure 4.3.13-4.

Projected Changes in Population

According to the 2018 5-year population estimates from the American Community Survey, the population of Sussex County (i.e., 142,298 persons) has decreased by approximately 4.7-percent since 2010. Even though the population has decreased, any changes in the density of population can impact the number of persons exposed to the wildfire hazard. Fire suppression capabilities are high at the State and local levels. However, new development and changes in population with a mix of additional structures, ornamental vegetation, and wildland fuels will require continued assessment of the hazard and mitigation risk.

Climate Change

According to the USDA Forest Service, climate change will likely alter the atmospheric patterns that affect fire weather. Changes in fire patterns will, in turn, impact carbon cycling, forest structure, and species composition (EPA 2020). Climate change associated with warmer temperatures, changes in rainfall, and increased periods of drought may create an atmospheric and fuel environment that is more conductive to large, severe fires (USDA 2013). Under a changing climate, wildfires exceeding 50,000 acres has increased over the past 30 years (USDA 2013). However, a study from the National Interagency Fire Center of the USGS shows that the number of acres burned by wildfires in New Jersey has decreased by 0.25 acres per square mile from events that took place in 2000 to 2014 compared to events that took place in 1984 and 1999 (EPA 2020).

Understanding the climate/fire/vegetation interactions is essential for addressing issues associated with climate change that include:

- Effects on regional circulation and other atmospheric patterns that affect fire weather
- Effects of changing fire regimes on the carbon cycle, forest structure, and species composition, and
- Complications from land use change, invasive species and an increasing WUI.

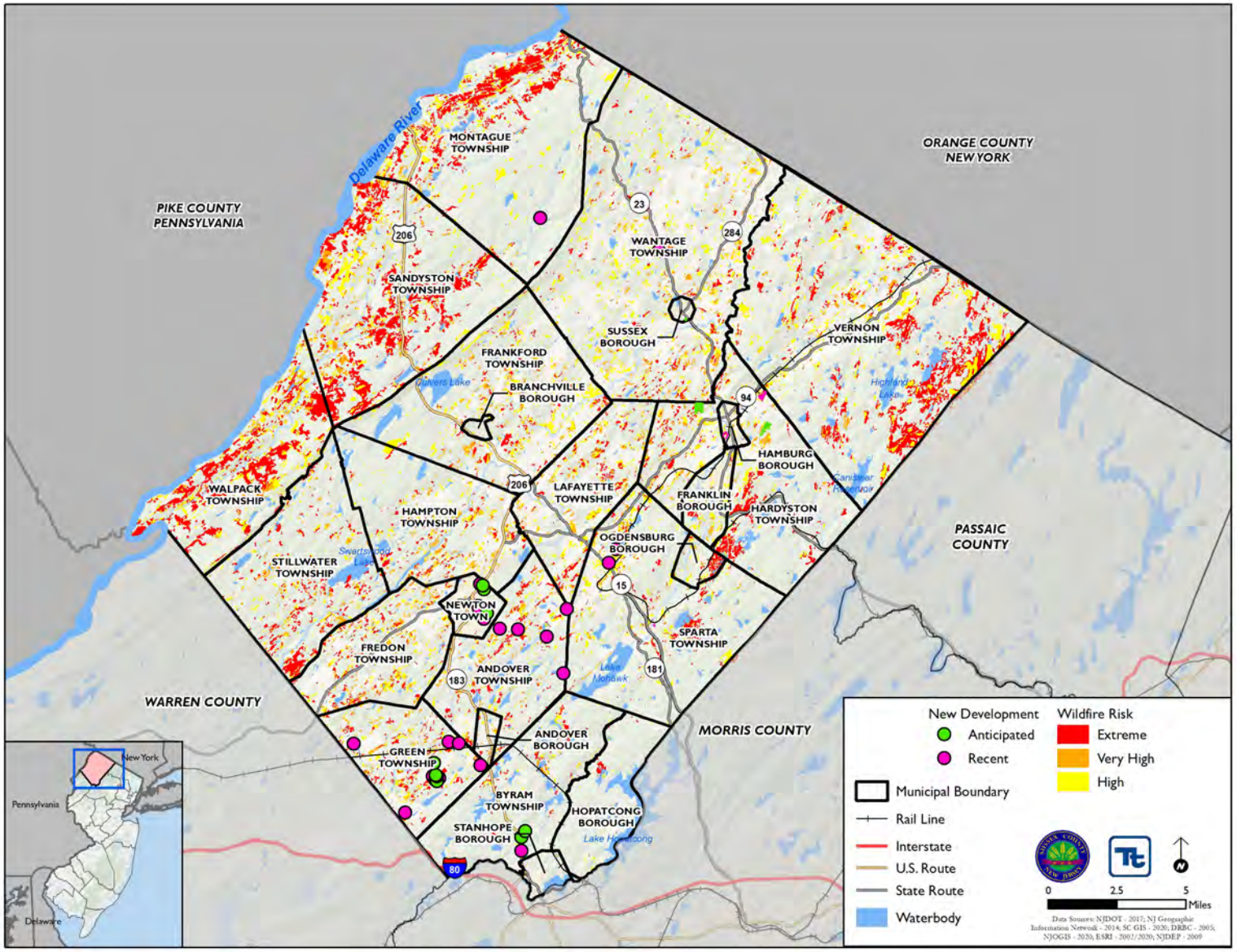
As discussed earlier, average temperatures are anticipated to increase in New Jersey, therefore, suitability of habitats for specific types of trees potentially changes, altering the fire regime and resulting in more frequent fire events and changes in intensity. Prolonged and more frequent heat waves have the potential to increase the likelihood of a wildfire. The increased potential combined with stronger winds may make it harder to contain fires and thus increase the County's vulnerability to this hazard.

Vulnerability Change Since the 2016 HMP

The 2021 HMP has been updated to reflect 2014-2018 American Community Survey 5-year estimates for population changes. The building stock inventory was updated using data from Sussex County. Further, the building stock inventory replacement cost values were updated using RS Means 2020 values providing an overall update to the assets assessed in this risk assessment. The NJDEP Wildfire Fuel Hazard spatial layer has not been

updated since the last HMP; therefore, changes and any increases in overall wildfire hazard exposure are attributed to changes in population density and new development.

Figure 4.3.13-4. Wildfire Risk and New Development for Sussex County



SECTION 5. CAPABILITY ASSESSMENT

2021 HMP Changes

- In the 2016 HMP, the capability assessment section was presented in Section 6 as part of the mitigation strategy. For the 2021 HMP update, the capability assessment was expanded and presented in Section 5 as a stand-alone section with capabilities expanded in each jurisdictional annex as well (Section 9 [Jurisdictional Annexes]).

According to FEMA's *Mitigation Planning How-To Guide #3*, a capability assessment is an inventory of a community's missions, programs, and policies and an analysis of its capacity to carry them out. Each jurisdiction has a unique set of capabilities available to accomplish mitigation and reduce long-term vulnerable to future hazard events. Capabilities include authorities, policies, programs, staff, and funding. Reviewing existing capabilities helps identify capabilities that currently implement mitigation and leads to loss reductions or that have the potential to be implemented in the future.

This assessment is an integral part of the planning process. The assessment process enables identification, review, and analysis of current federal, state, and local programs, policies, regulations, funding, and practices that could either facilitate or hinder mitigation.

During the original planning process, Sussex County and participating jurisdictions identified and assessed their capabilities in the areas of existing programs, policies, and technical documents. By completing this assessment, each jurisdiction learned how or whether they would be able to implement certain mitigation actions by determining the following:

- Limitations that could exist on undertaking actions.
- The range of local and state administrative, programmatic, regulatory, financial, and technical resources available to assist in implementing their mitigation actions.
- Actions deemed infeasible, as they are currently outside the scope of capabilities.
- Types of mitigation actions that could be technically, legally (regulatory), administratively, politically, or fiscally challenging or infeasible.
- Opportunities to enhance local capabilities to support long term mitigation and risk reduction.

During the plan update process, all participating jurisdictions were tasked with developing or updating their capability assessment, paying particular attention to evaluating the effectiveness of these capabilities in supporting hazard mitigation and identifying opportunities to enhance local capabilities to integrate hazard mitigation into their plans, programs, and day-to-day operations.

County and municipal capabilities in the Planning and Regulatory, Administrative and Technical, and Fiscal subjects can be found in the Capability Assessment section of each jurisdictional annex in Section 9 (Jurisdictional Annexes).

5.1 UPDATE PROCESS SUMMARY

The purpose of the capability assessment is to understand the planning, regulatory, administrative, technical, and financial capabilities present in Sussex County. This assessment helps the County and its jurisdictions identify strengths and opportunities that can be used to reduce losses from hazard events and reduce risks throughout Sussex County.

To complete the capability assessment, the contracted consultant met with Sussex County and each municipality virtually to review the capability assessment from the 2016 HMP and update accordingly. In addition to in-person meetings, the consultant reviewed plans and codes/ordinances to enhance the information provided by the jurisdictions.

A summary of the various federal and state capabilities available to promote and support mitigation and reduce risk in Sussex County are presented below. Information provided by the County and municipalities are presented in Volume II, Section 9 (Jurisdictional Annexes) of this plan update.

5.2 PLANNING AND REGULATORY CAPABILITY

Planning and regulatory capabilities are based on the implementation of ordinances, policies, local laws and state statutes, and plans and programs that relate to guiding and management growth and development. Planning and regulatory capabilities refer not only to the current plans and regulations, but also to the jurisdiction's ability to change and improve those plans and regulations as needed. The following provides the planning and regulatory capabilities for Sussex County.

5.2.1 PLANNING AND REGULATORY CAPABILITIES – FEDERAL AND STATE

Table 5-1. Planning and Regulatory Capabilities – Federal and State

Capability	Details	
Disaster Mitigation Act (DMA)	**Description:**	The DMA is the current federal legislation addressing hazard mitigation planning. It emphasizes planning for disasters before they occur. It specifically addresses planning at the local level, requiring plans to be in place before Hazard Mitigation Assistance grant funds are available to communities. This plan is designed to meet the requirements of DMA, improving eligibility for future hazard mitigation funds.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	HMPs designed to meet the requirements of DMA will remain eligible for future FEMA Hazard Mitigation Assistance funds
	Hazard:	All-natural hazards
National Flood Insurance Program (NFIP)	**Description:**	The NFIP is a federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages. The Flood Hazard Profile in Section 4.3.5 (Flood) provides information on recent legislation related to reforms to the NFIP. All municipalities in Sussex County participate in the NFIP.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Full compliance and good standing under the NFIP are application prerequisites for all FEMA grant programs for which participating jurisdictions are eligible under this plan.
	Hazard:	Flood
NFIP Community Rating System (CRS)	**Description:**	As an additional component of the NFIP, 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 the community actions meeting the three goals of the CRS: (1) reduce flood losses, (2) facilitate accurate insurance rating, and (3) promote the awareness of flood insurance. Municipalities, and the county as a whole, could expect significant cost savings on premiums if enrolled in the CRS program. At this time, no communities in Sussex County participate in the CRS program.
	Responsible Agency:	FEMA

Capability	Details	
	Provides Funding for Mitigation:	CRS premium discounts on flood insurance range from 5 percent for Class 9 communities up to 45 percent for Class 1 communities.
	Hazard:	Flood
Municipal Land Use Law	**Description:**	The State of New Jersey Municipal Land Use Law (L.1975, c. 291, s. 1, effective August 1, 1976) is the legislative foundation for the land use process in the State of New Jersey, including decisions by Planning Boards and Zoning Boards of Adjustment. It defines the powers and responsibilities of boards and is essential to their functions and decisions. It also provides the required components of a municipal master plan. Every municipal agency must adopt and can amend reasonable rules and regulations, consistent with this act or with any applicable ordinance, for the administration of its functions, powers, and duties. These plans help jurisdictions review their land use plans and policies with public participation. The Municipal Land Use Law requires that each municipality prepare a comprehensive plan and update that plan every 10 years.
	Responsible Agency:	State of New Jersey
	Provides Funding for Mitigation:	No
	Hazard:	All
State of New Jersey Hazard Mitigation Plan (2019 Update)	**Description:**	The State of New Jersey HMP includes an evaluation of the state's overall pre- and post-hazard mitigation policies, programs, and capabilities; the policies related to development in hazard-prone areas; and the state's funding capabilities. The State of New Jersey HMP thoroughly describes the federal and state programs available to Sussex County to promote mitigation. The State of New Jersey HMP was used as a resource in developing Sussex County's HMP update.
	Responsible Agency:	NJOEM
	Provides Funding for Mitigation:	No
	Hazard:	All
Critical Area Protection Policy	**Description:**	The following NJDEP programs both protect critical natural resources, and provide funding for the State, municipalities, and counties to purchase land for open-space preservation and recreation, which may directly or indirectly support hazard mitigation efforts: • Green Acres Program • Blue Acres Program • Historical Preservation Program • Farmland Preservation • Wetlands Act of 1970 (N.J.S.A. 13:9A) • Soil and Erosion and Sediment Control Act (N.J.S.A. 4:24) The Wetlands Act of 1970 (N.J.S.A. 13:9A) provide rules and regulations governing development in wetland areas of New Jersey. New Jersey has 15 soil conservation districts, following county boundaries that implement the New Jersey Soil Erosion and Sediment Control Act (N.J.S.A. 4:24), which governs certain aspects of new development. According to the Sussex County Comprehensive Farmland Preservation Plan of 2008, the State Development and Redevelopment Plan designates most of Sussex County as Rural and Environmentally-sensitive lands, and encourages the clustering of development within defined centers in order to preserve the county's rural environment. In line with the 2003 Comprehensive Farmland Preservation Plan, the county's mission continues to include farmland preservation. The county has undertaken initiatives to promote the economic well-being of local farmers and has identified additional initiatives to promote the local agricultural industry.

Capability	Details	
	Responsible Agency:	NJDEP, Sussex County Agriculture Development Board, Morris Land Conservancy
	Provides Funding for Mitigation:	Yes – the various programs (Green Acres, Blue Acres) provide funding to jurisdictions to acquire land and properties and turn into open space. The Sussex County Preservation Trust can be used to acquire floodprone residential properties.
	Hazard:	Flood, Severe Weather
Uniform Construction Code (UCC)	**Description:**	Building codes mandate best practices and technology, much of which is designed to reduce or prevent damage from occurring when structures are under stress. The UCC adopts up-to-date building codes as its Building Subcode and One- and Two-Family Subcode. These Subcodes contain requirements that address construction in both A and V flood zones. Also, all new construction is required to comply with the UCC for flood zone construction. New Jersey has enacted legislation directing the Department of Community Affairs (NJ DCA) to adopt a radon hazard code or revise the state building code to establish "adequate and appropriate standards to ensure that schools and residential buildings within tier one areas [as defined by the state] ... are constructed in a manner that minimizes radon gas and radon progeny entry and facilitates any subsequent remediation that might prove necessary." See N.J. Stat. Ann. 52:27D-123a. The Department then adopted a radon hazard sub-code which does not reference existing model standards or guidance, but which sets forth the basic requirements for a passive sub-slab or sub-membrane depressurization system. See N.J. Admin. Code 5:23-10.4. The radon control standards and procedures apply to new residential construction (and school construction) in "tier one" areas, as defined by the state, and Appendix 10-A of the sub-code lists the specific municipalities that are designated as tier one areas.
	Responsible Agency:	NJ DCA
	Provides Funding for Mitigation:	No
	Hazard:	All
Floodplain Management Policy	**Description:**	New Jersey State Law Flood Hazard Area Control Act (NJSA 58:16A-52): The Act and regulations attempts to minimize damage to life and property from flooding caused by development within fluvial and tidal flood hazard areas, to preserve the quality of surface waters, and to protect the wildlife and vegetation that exist within and depend upon such areas for sustenance and habitat. While it does not require local adoption, as it is enforced by the NJDEP, the floodplain ordinances of each municipality need to be reviewed to be in compliance with this new regulation.
	Responsible Agency:	New Jersey Department of Environmental Protection (NJDEP)
	Provides Funding for Mitigation:	No
	Hazard:	Flood
Growth Management Policy	**Description:**	Land preservation and recreation comprise one of the cornerstones of New Jersey's smart growth policy. The New Jersey Statewide Comprehensive Outdoor Recreation Plan provides Statewide policy direction to the State, local governments, and conservation organizations in the preservation of open space and the provision of public recreation opportunities. The State Plan was prepared and adopted by the State Planning Commission according to the requirements of the State Planning Act of 1985 as amended (NJSA 52:18A-196 et seq.) to serve as an instrument of State policy to guide State agencies and local government in the exercise of governmental powers regarding planning, infrastructure investment and

Capability	Details	
		other public actions and initiatives that affect and support economic growth and development in the State. Green Acres Program, Open Space Tax Program, and Development and Redevelopment Plan. The State Planning Act has enhanced the traditionally limited role of county land-use planning and control. Also provides tools for municipalities when preparing their master land use plans and better opportunity for a comprehensive approach to planning so not to harm or be in conflict with neighboring Municipalities' plans.
	Responsible Agency:	
	Provides Funding for Mitigation:	No
	Hazard:	All

5.2.2 PLANNING AND REGULATORY CAPABILITIES – COUNTY AND LOCAL

Detailed information regarding these capabilities can be found in each jurisdictional annex found in Volume II, Section 9 (Jurisdictional Annexes).

5.3 ADMINISTRATIVE AND TECHNICAL CAPABILITY

Administrative and technical capabilities refer to the jurisdiction's staff and their skills and tools that can be used for mitigation planning and implementation. It also refers to the ability to access and coordinate the resources effectively. The following provides the administrative and technical capabilities for Sussex County.

5.3.1 ADMINISTRATIVE AND TECHNICAL CAPABILITY – FEDERAL AND STATE

Table 5-2. Administrative and Technical Capability – Federal and State

Capability		
Recovery Bureau	**Description:**	The Chief of the Recovery Bureau supervises the Mitigation, Public Assistance, and Finance Units. The Mitigation Unit undertakes hazard mitigation planning and the review of mitigation projects in advance of potential disasters and is also activated during and immediately after disasters to evaluate existing and proposed mitigation measures in the affected areas.
	Responsible Agency:	NJOEM
	Provides Funding for Mitigation:	No
	Hazard:	All
Mitigation Unit	**Description:**	The Mitigation Unit, within the Emergency Management Section, has the mission of enhancing state, county, and municipal risk reduction through the development and implementation of mitigation strategies. Hazard mitigation, by definition, is any sustained action that prevents or reduces the loss of property or human life from recurring hazards. The Mitigation Unit accomplishes this task by implementing and administering several grant-based programs in conjunction with FEMA.
	Responsible Agency:	NJOEM
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Preparedness Bureau	**Description:**	The Preparedness Unit in the Preparedness Bureau is responsible for disseminating preparedness information in advance of a disaster or potential disaster. The Preparedness Unit maintains an extensive library of natural disaster preparedness and recovery information on its Plan and Prepare website (http://ready.nj.gov/plan-prepare/index.shtml). The disaster preparedness and recovery information featured prominently on the New Jersey State Police and NJOEM website home pages

Capability		
		(http://njsp.org/ and http://ready.nj.gov/index.shtml)is a critical part of New Jersey's efforts to protect public health and safety and to minimize loss of life and property in the event of a disaster.
	Responsible Agency:	NJOEM
	Provides Funding for Mitigation:	No
	Hazard:	All
Hazard Mitigation Grant Program Administrative Plan	**Description:**	In the event that an active disaster declaration has necessitated a FEMA-approved Hazard Mitigation Grant Program (HMGP) Administrative Plan, the plan is reviewed to ensure compliance with the prevailing guidance and to set forth the administrative procedures, organization, and requirements for administering the HMGP in New Jersey. The HMGP Administrative Plan is developed by the state and details the process for prioritizing post-disaster mitigation funding of local mitigation projects.
	Responsible Agency:	NJOEM
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Bureau of Dam Safety & Flood Control	**Description:**	The Bureau of Dam Safety & Flood Control leads the state's efforts filling the State NFIP Coordinator position and providing Community Rating System (CRS) support. In addition, the section's responsibilities include the funding of construction and operation of federal, state, and local flood control mitigation projects throughout the state. The section has also taken a lead role on the development and adoption of NJ Flood Hazard Area mapping, as well as an active partnership with FEMA on their Map Modernization Program efforts. The bureau assists communities participating in the NFIP and interested in joining CRS through the NJDEP Community Assistance Program Unit.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	Flood, Severe Weather
Dam Safety Section	**Description:**	The NJDEP Dam Safety Section under the Bureau of Dam Safety & Flood Control has responsibility for overseeing dam safety in the state. The primary goal of the program is to ensure the safety and integrity of dams in New Jersey, and thereby protect people and property from the consequences of dam failures. The section also coordinates with the Division of State Police, local and county emergency management officials in the preparations and approval of emergency action plans. The Dam Safety Section reviews plans and specifications for the construction of new dams or for the alteration, repair, or removal of existing dams. The section must grant approval before the owner can proceed with construction. Engineers from the Dam Safety Section evaluate each project, investigate site conditions, and check recommended construction materials. During construction, engineers identify conditions that may require design changes, check for compliance with approved plans and specifications, and approve foundations before material is placed. Existing dams are periodically inspected to assure that they are adequately maintained, and owners are directed to correct any deficiencies found. The regulations require the owner to obtain a professional engineer to inspect their dams on a regular basis. These investigations include a comprehensive review of all pertinent material contained in the Section's files, a visual inspection, technical studies when necessary, and preparation of a comprehensive report.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes

Capability		
	Hazard:	Flood, Severe Weather
Division of Water Supply and Geoscience	**Description:**	This Division works to ensure adequate, reliable, and safe water supply is available for the future. This goal is accomplished through the regulation of ground and surface water diversions, permitting of wells, permitting of drinking water infrastructure, monitoring of drinking water quality, and technical support for water systems to achieve compliance with all federal and state standards. Water Supply staff provides technical assistance to assist water systems during water supply emergencies, as needed to re-establish safe and adequate public water supplies, and to address routine non-compliance from significant deficiencies or poor water quality test results. The Drinking Water State Revolving Fund (DWSRF) program assists water systems in financing the cost of infrastructure through the use of federal and New Jersey Environmental Infrastructure Trust (NJEIT) funds. Additionally, Water Supply provides operator licensing and training support as well as financial assistance through the DWSRF program.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	All
New Jersey Geological and Water Survey	**Description:**	The New Jersey Geological and Water Survey evaluates geologic, hydrogeologic and water quality data to manage and protect water resources, to identify natural hazards and contaminants, and to provide mineral resources including offshore sands for beach nourishment. Information provided by the survey includes GIS data and maps of geology, topography, groundwater, and aquifer recharge. In addition, the data tracks wellhead protection areas, aquifer thicknesses, properties and depths, groundwater quality, drought, geologic resources, and hazards such as earthquakes, abandoned mines, karst-influenced sinkholes, and landslides.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	No
	Hazard:	Drought, Earthquake, Geological
Office of Planning Advocacy	**Description:**	The New Jersey Office of Planning Advocacy (OPA) supports and coordinates planning throughout the state to protect the environment, mitigate development hazards and guide future growth into compact, mixed use development and redevelopment while fostering a robust long-term economy. The OPA implements the goals of the State Development and Redevelopment Plan to achieve comprehensive, long-term planning; and integrates that planning with programmatic and regulatory land use decisions at all levels of government and the private sector.
	Responsible Agency:	New Jersey Department of the State
	Provides Funding for Mitigation:	No
	Hazard:	Natural Hazards
Office of the State Climatologist	**Description:**	The Office of the New Jersey's State Climatologist (ONJSC) generates and archives climate data. Generated data are from the New Jersey Weather and Climate Network (NJWxNet), which is an assemblage of 55 automated weather stations situated throughout the state. A decade or more of hourly observations are available from some of the stations, while others have shorter records. Since fall 2012 observations are available on a five-minute basis. Along with these records, ONJSC archives or has ready access to National Weather Service Cooperative Weather Station data. These are daily observations from several dozen stations at any given time over the past century. Individual stations have as many as 120 years of data while other stations have started or ceased operating since the late 1800s. Another

Capability		
		source of generated data is the Community Collaborative Rain, Hail and Snow Network (CoCoRaHS), which includes daily observations of rain and snow from as many as several hundred volunteers throughout the state.
	Responsible Agency:	Rutgers University
	Provides Funding for Mitigation:	No
	Hazard:	Natural Hazards
New Jersey Climate Adaptation Alliance (NJADAPT)	**Description:**	NJADAPT focuses on climate change preparedness for New Jersey in key impact sectors (public health; watersheds, rivers and coastal communities; built infrastructure; agriculture; and natural resources). NJADAPT is a collaborative effort of scientists and data managers in academia, government, the private sector and non-governmental organization community who have developed a strategic plan for a New Jersey platform to host and apply climate science impacts and data. The NJADAPT website (http://www.njadapt.org/) includes a flood exposure profile for community discussions about hazard impacts; NJ Flood Mapper (which is a tool for flooding hazards and sea level rise); and Getting to Resilience (a tool used to help communities reduce vulnerability and increase preparedness).
	Responsible Agency:	Rutgers University
	Provides Funding for Mitigation:	No
	Hazard:	Natural Hazards
New Jersey Highlands Council	**Description:**	The Highlands Water Protection and Planning Council (Highlands Council) is a regional planning agency that works in partnership with municipalities and counties in the Highlands Region to encourage a comprehensive regional approach to implementing the 2004 Highlands Water Protection and Planning Act (the Highlands Act). The Highlands Act established the Highlands Council and charged it with the creation and adoption of a regional master plan to protect and enhance the natural resources within the New Jersey Highlands. The Highlands Regional Master Plan (RMP) was adopted by the Highlands Council on July 17, 2008 and became effective on September 8, 2008. Conformance with the Highlands RMP is a two-phase process: petition and implementation. During the petition process, municipalities and counties work in collaboration with Highlands Council staff to prepare draft documents that will integrate the land use and resource management requirements of the Highlands Act into local regulatory and planning documents. Once a petition is approved by the Highlands Council, work begins on implementation, which involves finalizing those documents for local adoption and ongoing management of resources. Southeastern areas of Sussex County are located in the Highlands Region. The Highlands Council may provide grant funding to municipalities and counties to support local hazard mitigation planning. Such plans would identify local level risks associated with extreme storm events and develop local actions that would potentially prevent or mitigate hazardous situations. For example, grants fund stormwater management plans which support green infrastructure for stormwater management, as well as stormwater mitigation plans. These plans should be in place prior to disaster events. Highlands Council grants may be used for planning, design, and/or engineering activities, but do not fund capital expenses. The Highlands Council is participating in the Governor's Climate Resiliency initiative and is preparing to develop a Highlands Climate Change chapter of the Regional Master Plan.

Capability		
		The Highlands Council has initiated a stormwater management program for counties and municipalities to assist in advance planning. The Council also requires extensive green stormwater infrastructure for all projects reviewed. The Highlands was a member of the Advisory Committee when Sussex County developed their Green Stormwater Infrastructure Element.
	Responsible Agency:	New Jersey Highlands Council
	Provides Funding for Mitigation:	Yes
	Hazard:	All
North Jersey Transportation Planning Authority (NJTPA)	**Description:**	The NJTPA is the federally authorized Metropolitan Planning Organization for the 13-county northern New Jersey region. Each year, they oversee over $2 billion in transportation improvement projects and provide a forum for interagency cooperation and public input. The Passaic River Basin Climate Resilience Planning Study was completed in 2019. The study focuses on the potential impacts that climate change will have on transportation infrastructure located within the Passaic River Basin, of which extreme southeastern Sussex County is a part of. The results of their analysis are included in the Sussex County HMP's risk assessment and their recommendations were shared with the Planning Partnership to reduce transportation asset vulnerability to climate change and increase resilience to existing and future heat or flooding events.
	Responsible Agency:	NJTPA
	Provides Funding for Mitigation:	Yes - planning
	Hazard:	All
U.S. Army Corps of Engineers (USACE)	**Description:**	The USACE works with NJDEP to mitigate flooding in Sussex County as needs arise.
	Responsible Agency:	USACE
	Provides Funding for Mitigation:	Yes
	Hazard:	Flood

5.3.2 ADMINISTRATIVE AND TECHNICAL CAPABILITY – COUNTY AND LOCAL

Table 5-3 summarizes the administrative and technical capabilities in Sussex County. Detailed information regarding administrative and technical capabilities in the County and the municipalities can be found in each jurisdictional annex found in Volume II, Section 9 (Jurisdictional Annexes).

Table 5-3. Administrative and Technical Capability – County and Local

Capability		
Sussex County Sheriff's Office, Division of Emergency Management (DEM)	**Description:**	The Sussex County Sheriff's Office has the responsibility for a wide range of law enforcement services: Bureau of Corrections; Bureau of Law Enforcement; and Security of the County Court Complex. The Sussex County DEM is a division of the Sheriff's Office. The Sussex County DEM is a county-level emergency service required by statute that coordinates resources to serve the needs of Sussex County during times of emergency events and disasters. In carrying out its responsibilities, the DEM oversees the emergency management activities of all county agencies and Sussex County's 24 municipalities. Each municipality has an emergency management coordinator with whom this division interacts and the coordinators, in turn, interact at the local level with police, fire, EMS, public works, public health, schools, etc. In addition to the foregoing, the DEM presents training and educational programs including personal emergency preparedness, access and functional needs and incident command for responders. The division also oversees two community alert programs, Swift911™ and Register Ready, that are of tremendous service to the public. The Sussex County DEM is leading the HMP update and hosting information about the HMP on their website (https://www.sussex.nj.us/cn/webpage.cfm?TID=7&TPID=11091) including a link to the citizen survey. As mitigation grant funding becomes available, the Sussex County DEM distributes information to the municipal coordinators at quarterly meetings.
	Responsible Agency:	Sussex County Sheriff's Office, Division of Emergency Management (DEM)
	Provides Funding for Mitigation:	No
	Hazard:	All
Sussex County Division of Planning and Economic Development	**Description:**	The Sussex County Division of Planning and Economic Development is responsible for providing staff and technical assistance to the County Planning Board, Agricultural Development Board, Solid Waste Advisory Committee, 208 Water Quality Policy Advisory Committee, Strategic Growth Advisory Committee and Board of Chosen Commissioners on all matters related to land use, development and conservation. The Division manages the following programs: • Census data for the county • Housing Market • Cross Acceptance • Development Review • Economic Development • Farmland Preservation • Open Space Preservation • Regional Planning • Solid Waste Planning • Transportation Planning • Water Quality Management Planning • Conferences and Presentations

Capability		
	Responsible Agency:	Sussex County Division of Planning
	Provides Funding for Mitigation:	No
	Hazard:	All
Sussex County Planning Board	**Description:**	The Sussex County Planning Board is responsible for approving site plan and subdivision applications within their jurisdiction in accordance with the New Jersey County Planning Enabling Act. A Development Review Committee reviews all applications and acts on behalf of the full Board. Applications for waiver from County development standards are heard by the full Board with input from county engineering and planning staff.
	Responsible Agency:	Board of Chosen Commissioners
	Provides Funding for Mitigation:	No
	Hazard:	All
Sussex County Division of Engineering	**Description:**	The Sussex County Division of Engineering is charged with overseeing the numerous facets associated with maintaining, improving, and monitoring the county's transportation network. The Division works closely with the Division of Facilities Management providing project support and civil/survey design services for a variety of facility related capital improvement projects. Additionally, the Division of Engineering provides technical support to the Division of Planning. Included within the department's responsibilities are tasks such as in-house design of road and bridge improvement projects, management of multimillion dollar design projects, monitoring the condition of bridges; signals; signs; traffic markings and other similar infrastructure items, developing long term capital budgets, construction stakeout, ROW surveys, management of county road and bridge construction projects, track traffic trends, and monitor work within the county right of way through road opening and driveway permits. The Division supported the update of the 2021 Sussex County HMP, is a member of the Steering Committee, and reviewed and contributed to the plan and County annex.
	Responsible Agency:	Sussex County Department of Engineering
	Provides Funding for Mitigation:	No
	Hazard:	All
Sussex County Open Space Committee	**Description:**	The Sussex County Open Space Committee consists of seven voting members who are appointed by the Board of Chosen Commissioners. The members are drawn from the agricultural, nonagricultural and business communities. The Committee oversees the use of Open Space Trust Fund dollars to acquire lands and wetlands for the protection of environmentally sensitive areas; for the preservation of scenic, cultural or historically valuable areas; and for public outdoor recreation areas.
	Responsible Agency:	Board of Chosen Commissioners

Capability		
	Provides Funding for Mitigation:	Yes
	Hazard:	Flood
Sussex County Division of Public Works	**Description:**	The Sussex County Division of Public Works is responsible for the proper maintenance, surfacing, resurfacing, drainage and repair of all County roads, bridges, and drains. The Office of Roads maintains all County roads, bridges, and drains and keeps them in a clear and safe condition. The Division is also in charge of removing all snow, ice, leaves, debris, or other matter that may impede or restrict travel within the County. The Division investigates complaints involving County roads and bridges and then takes proper action to see that the needed repairs are made with a minimum of delay. The Division supported the update of the 2021 Sussex County HMP, is a member of the Steering Committee, and reviewed and contributed to the plan and County annex.
	Responsible Agency:	Division of Public Works
	Provides Funding for Mitigation:	No
	Hazard:	Hurricane, Nor'Easter, Flood, Severe Weather, Severe Winter Weather
Sussex County Department of Health and Environmental Services	**Description:**	The Sussex County Department of Health and Environmental Services' mission is to protect, promote, maintain and improve the health and quality of life for Sussex County citizens and visitors through a responsive, well managed and organized community effort. The Department has information on who to contact in times of emergency on their website (local radio stations, state and federal resources). The following are under the Department; some of which are described more fully below: • Environmental Health • Public Health Nursing • Emergency Preparedness • HAZ-MAT • Special Child Health Services • Weights and Measures • Mosquito Control • Health Education Topics • Sussex-Warren Chronic Disease Coalition
	Responsible Agency:	Department of Health and Environmental Services
	Provides Funding for Mitigation:	No
	Hazard:	All

Capability		
Sussex County GIS Management	**Description:**	Geographic Information Systems (GIS) provides mapping and GIS services to meet the business needs of county divisions, constitutional offices, local government and not-for-profit organizations within Sussex County. This includes providing support and maintenance in the areas of data conversion, cartography, computer graphics and visualization, Global Positioning Systems (GPS), database design and software development. GIS Management supported the update of the 2021 Sussex County HMP, is a member of the Steering Committee, and reviewed and contributed to the plan and County annex.
	Responsible Agency:	Sussex County GIS Management
	Provides Funding for Mitigation:	No
	Hazard:	All Hazards
Sustainable Jersey	**Description:**	Sustainable Jersey is a nonprofit organization that provides tools, training and financial incentives to support communities as they pursue sustainability programs. By supporting community efforts to reduce waste, cut greenhouse gas emissions, and improve environmental equity, Sustainable Jersey aims to empower communities to build a better world for future generations. The organization also offers a certification program. Sustainable Jersey certification is a designation for municipal governments in New Jersey. All actions taken by municipalities to score points toward certification must be accompanied by documentary evidence and is reviewed. The certification is free and completely voluntary.
	Responsible Agency:	-
	Provides Funding for Mitigation:	No
	Hazard:	All
Sussex County HAZ-MAT Team	**Description:**	The Sussex County HAZ-MAT team, consists of 20+/- full time county employees trained to the technician level, available to respond to environmental and public health emergencies 24 hours a day, seven days a week. A collaborative effort between the Sussex County Sheriff's Office, the Sussex County Office of the Prosecutor, the Sussex County Division of Public Works, and the Sussex County Sussex County Department of Environmental and Public Health Services, the team was recognized by the State of New Jersey, Department of Environmental Protection as a Model Program for Hazardous Material Response. With the assistance of the County Office of Emergency Management and the Sussex County Public Safety Training Academy, the program has matured into a valuable asset and tool for the municipalities of Sussex County. State of the art haz-mat equipment including response vehicles, air monitoring instruments, personal protective equipment, and decon units were all paid for through Homeland Security Grants received from the State and Federal Government with very little impact from county tax dollars.
	Responsible Agency:	Sussex County Sheriff's Office, the Sussex County Office of the Prosecutor, the Sussex County Division of Public Works, and the Sussex County Sussex County Department of Environmental and Public Health Services
	Provides Funding for Mitigation:	No
	Hazard:	Hazardous Materials

Capability		
Sussex County Economic Development Partnership (SCEDP)	**Description:**	The Sussex County Economic Development Partnership, Inc. (SCEDP) is dedicated to the creation of sustainable economic opportunity and prosperity to improve the quality of life in Sussex County, NJ. The SCEDP will proactively facilitate the recruitment, retention and expansion of business that will complement, and be consistent with, the character and environment of Sussex County.
	Responsible Agency:	Sussex County Economic Development Partnership
	Provides Funding for Mitigation:	No
	Hazard:	-
Rutgers Cooperative Extension of Sussex County	**Description:**	Rutgers Cooperative Extension is part of the Federal Land Grant University system serving as the educational outreach arm of the United States Department of Agriculture. Rutgers Cooperative Extension of Sussex County was established in 1912 and was the first Cooperative Extension program in New Jersey. The office provides research-based information to help Sussex County residents acquire knowledge to make informed decisions to maintain or improve their quality of life. Educational programs are provided without regard to race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, or marital or family status. Program delivery methods include: classes and conferences, telephone and in-person consultations, replies to emailed questions, newspaper columns, radio and television programs, bus trips, fairs and clubs, field meetings and demonstrations, computerized diet and financial analyses, videos, newsletters, fact sheets, speaking engagements for organizations and work sites, exhibits and displays, and web sites.
	Responsible Agency:	Rutgers Cooperative Extension of Sussex County
	Provides Funding for Mitigation:	No
	Hazard:	All hazards

5.4 FISCAL CAPABILITIES

Fiscal capabilities are the resources that a jurisdiction has access to or is eligible to use to fund mitigation actions. The table below provides a list of programs, descriptions, and links for those jurisdictions seeking funding sources. This table is not intended to be a comprehensive list, but rather a tool to help begin identifying potential sources of funding.

Table 5-4. Fiscal Capabilities

Capability		
Federal		
Hazard Mitigation Grant Program	**Description:**	The HMGP is a post-disaster mitigation program. FEMA makes these grants available to states by after each federal disaster declaration. The HMGP can provide up to 75 percent funding for hazard mitigation measures and can be used to fund cost-effective projects that will protect public or private property or that will reduce the likely damage from future disasters in an area covered by a federal disaster declaration. Examples of projects include acquisition and demolition of structures in hazard prone areas, flood-proofing or elevation to reduce future damage, minor structural improvements, and development of state or local standards. Projects must fit into an overall mitigation strategy for the area identified as part of a local planning effort. All applicants must have a FEMA-approved HMP (this plan). Additional information regarding the HMGP is available on the FEMA website: https://www.fema.gov/grants/mitigation Sussex County has received HMGP funding, including funding to purchase generators to provide continuity of operations during utility failures.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Flood Mitigation Assistance Program	**Description:**	The FMA program combines the previous Repetitive Flood Claims and Severe Repetitive Loss Grants into one grant program. The FMA provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP. The FMA is funded annually; no federal disaster declaration is required. Only NFIP insured homes and businesses are eligible for mitigation in this program. Funding for FMA is very limited and, as with the HMGP, individuals cannot apply directly for the program. Applications must come from local governments or other eligible organizations. The federal cost share for an FMA project is at least 75 percent. For the nom-federal share, at most 25 percent of the total eligible costs must be provided by a non-federal source; of this 25 percent, no more than half can be provided as in-kind contributions from third parties. At minimum, a FEMA-approved local flood mitigation plan is required before a project can be approved. The FMA funds are distributed from FEMA to the state. NJOEM serves as the grantee and program administrator for the FMA program. The FMA program is detailed on the FEMA website: https://www.fema.gov/grants/mitigation/floods
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	Flood, Severe Weather
Building Resilient Infrastructure	**Description:**	Building Resilient Infrastructure and Communities (BRIC) will support states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. BRIC is a new FEMA

Capability		
and Communities (BRIC) Program		pre-disaster hazard mitigation program that replaces the existing Pre-Disaster Mitigation (PDM) program. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency. For additional information regarding the BRIC program, please refer to: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Individual Assistance	**Description:**	Individual Assistance (IA) provides help for homeowners, renters, businesses, and some non-profit entities after disasters occur. This program is largely funded by the U.S. Small Business Administration. For homeowners and renters, those who suffered uninsured or underinsured losses could be eligible for a Home Disaster Loan to repair or replace damaged real estate or personal property. Renters are eligible for loans to cover personal property losses. Individuals are allowed to borrow up to $200,000 to repair or replace real estate, $40,000 to cover losses to personal property, and an additional 20 percent for mitigation. For businesses, loans could be made to repair or replace disaster damages to property owned by the business, including real estate, machinery and equipment, inventory, and supplies. Businesses of any size are eligible. Non-profit organizations, such as charities, churches, and private universities are eligible. An Economic Injury Disaster Loan provides necessary working capital until normal operations resume after a physical disaster but are restricted by law to small businesses only. IA is detailed on the FEMA website: https://www.fema.gov/individual-disaster-assistance.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Public Assistance	**Description:**	Public Assistance (PA) provides cost reimbursement aid to local governments (state, county, local, municipal authorities, and school districts) and certain non-profit agencies that were involved in disaster response and recovery programs or that suffered loss or damage to facilities or property used to deliver government-like services. This program is largely funded by FEMA with both local and state matching contributions required. PA is detailed on the FEMA website: https://www.fema.gov/public-assistance-local-state-tribal-and-non-profit.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Department of Homeland Security Grant Program	**Description:**	The Homeland Security Grant Program (HSGP) plays an important role in the implementation of the National Preparedness System by supporting the building, sustainment, and delivery of core capabilities essential to achieving the National Preparedness Goal of a secure and resilient nation. In FY 2020, the total amount of funds available under HSGP was $1.12 billion. HSGP is comprised of three interconnected grant programs including the State Homeland Security Program, Urban Areas Security Initiative (UASI), and the

Capability		
		Operation Stonegarden. Together, these grant programs fund a range of preparedness activities, including planning, organization, equipment purchase, training, exercises, and management and administration. Additional information regarding HSGP is available on the website: https://www.fema.gov/grants/preparedness/homeland-security.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Fire Management Assistance Grant Program	**Description:**	Assistance for the mitigation, management, and control of fires on publicly or privately-owned forests or grasslands that threaten such destruction as would constitute a major disaster. Provides a 75% federal cost share and the state pays the remaining 25% for actual cost. Information on this program is available on the website: https://www.fema.gov/assistance/public/fire-management-assistance.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	Wildfire
Assistance to Firefighters Grant Program	**Description:**	The primary goal of the Assistance to Firefighters Grants is to enhance the safety of the public and firefighters with respect to fire-related hazards by providing direct financial assistance to eligible fire departments, nonaffiliated Emergency Medical Services organizations, and State Fire Training Academies. This funding is for critically needed resources to equip and train emergency personnel to recognized standards, enhance operations efficiencies, foster interoperability, and support community resilience. Information regarding this grant program is available on the website: https://www.fema.gov/grants/preparedness/firefighters.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	Wildfire, Hazardous Materials
High Hazard Potential Dams Grant Program	**Description:**	The Rehabilitation of High Hazard Potential Dams Grant Program provides technical, planning, design, and construction assistance in the form of grants to non-Federal governmental organizations or nonprofit organizations for rehabilitation of eligible high hazard potential dams. Information regarding this program is available on the website: https://www.fema.gov/emergency-managers-management/dam-safety/grants/high-hazard-potential-dam-awards#:~:text=The%20High%20Hazard%20Potential%20Dam%20(HHPD)%20Grant%20Awards,equivalent%20state%20agency%20is%20eligible%20for%20the%20grant.
	Responsible Agency:	FEMA
	Provides Funding for Mitigation:	Yes
	Hazard:	Dam Failure
	Description:	The Small Business Administration (SBA) provides low-interest disaster loans to homeowners, renters, business of all sizes, and most private nonprofit organizations.

Capability		
Small Business Administration Loan		SBA disaster loans can be used to repair or replace the following items damaged or destroyed in a declared disaster: real estate, personal property, machinery and equipment, and inventory and business assets. Homeowners could apply for up to $200,000 to replace or repair their primary residence. Renters and homeowners could borrow up to $40,000 to replace or repair personal property-such as clothing, furniture, cars, and appliances that were damaged or destroyed in a disaster. Physical disaster loans of up to $2 million are available to qualified businesses or most private nonprofit organizations. Additional information regarding SBA loans is available on the SBA website: https://www.sba.gov/managing-business/running-business/emergency-preparedness/disaster-assistance.
	Responsible Agency:	SBA
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Community Development Block Grant Program	**Description:**	CDBG are federal funds intended to provide low and moderate-income households with viable communities, including decent housing, a suitable living environment, and expanded economic opportunities. Eligible activities include community facilities and improvements, roads and infrastructure, housing rehabilitation and preservation, development activities, public services, economic development, and planning and administration. Public improvements could include flood and drainage improvements. In limited instances and during the times of "urgent need" (e.g., post disaster) as defined by the CDBG National Objectives, CDBG funding could be used to acquire a property located in a floodplain that was severely damaged by a recent flood, demolish a structure severely damaged by an earthquake, or repair a public facility severely damaged by a hazard event. Additional information regarding CDBG is available on the website: https://www.hudexchange.info/programs/cdbg-entitlement/. In Sussex County, the following municipalities are eligible for CDBG funding: • Borough of Andover • Township of Andover • Borough of Branchville • Township of Byram • Township of Frankford • Borough of Franklin • Township of Fredon • Township of Green • Borough of Hamburg • Township of Hampton • Township of Hardyston • Borough of Hopatcong • Township of Lafayette • Township of Montague • Town of Newton • Borough of Ogdensburg • Township of Sparta • Township of Sandyston • Borough of Stanhope

Capability		
		• Township of Stillwater • Borough of Sussex • Township of Vernon • Township of Walpack • Township of Wantage
	Responsible Agency:	HUD
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Federal Highway Administration-Emergency Relief for Federally Owned Roads	**Description:**	The Federal Highway Administration (FHWA) Emergency Relief is a grant program through the U.S. Department of Transportation (DOT) that can be used for repair or reconstruction of federal-aid highways and roads on federal lands that have suffered serious damage as a result of a disaster. New Jersey Department of Transportation serves as the liaison between local municipalities and FHWA. Additional information regarding the FHWA Emergency Relief Program is available on the website: https://highways.dot.gov/federal-lands/programs/erfo
	Responsible Agency:	U.S. DOT
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Federal Transit Administration - Emergency Relief	**Description:**	The Federal Transit Authority (FTA) Emergency Relief is a grant program that funds capital projects to protect, repair, reconstruct, or replace equipment and facilities of public transportation systems. Administered by the Federal Transit Authority at the U.S. DOT and directly allocated to Metropolitan Transit Authority (MTA) and Port Authority, this transportation-specific fund was created as an alternative to FEMA PA. Additional information regarding the FTA Emergency Relief Program is available on the website: https://www.transit.dot.gov/funding/grant-programs/emergency-relief-program/emergency-relief-program.
	Responsible Agency:	U.S. DOT
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Disaster Housing Program	**Description:**	Emergency assistance for housing, including minor repair of home to establish livable conditions, mortgage and rental assistance available through the U.S. Department of Housing and Urban Development (HUD). Information on this program is available on the website: https://www.hud.gov/program_offices/public_indian_housing/publications/dhap.
	Responsible Agency:	HUD
	Provides Funding for Mitigation:	Yes
	Hazard:	All
HOME Investment Partnerships Program	**Description:**	Grants to local and state government and consortia for permanent and transitional housing, (including financial support for property acquisition and rehabilitation for low income persons). Information on this program is available on the website: https://www.hud.gov/hudprograms/home-program.

Capability		
	Responsible Agency:	HUD
	Provides Funding for Mitigation:	Yes
	Hazard:	-
HUD Disaster Recovery Assistance	**Description:**	Grants to fund gaps in available recovery assistance after disasters (including mitigation). Information on this program is available on the website: https://www.hud.gov/info/disasterresources.
	Responsible Agency:	HUD
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Section 108 Loan Guarantee	**Description:**	Enables states and local governments participating in the CDBG program to obtain federally guaranteed loans for disaster-distressed areas. Information on this program is available on the website: https://www.hudexchange.info/programs/section-108/.
	Responsible Agency:	HUD
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Smart Growth Implementation Assistance program	**Description:**	The Smart Growth Implementation Assistance (SGIA) program through the U.S. Environmental Protection Agency (EPA) focuses on complex or cutting-edge issues, such as stormwater management, code revision, transit-oriented development, affordable housing, infill development, corridor planning, green building, and climate change. Applicants can submit proposals under 4 categories: community resilience to disasters, job creation, the role of manufactured homes in sustainable neighborhood design, or medical and social service facilities siting. Information on this program is available on the website: https://www.epa.gov/smartgrowth.
	Responsible Agency:	EPA
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Partners for Fish and Wildlife	**Description:**	Financial and technical assistance to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats. Information on this program is available on the website: https://www.fws.gov/partners/.
	Responsible Agency:	U.S. Fish and Wildlife Service
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Transportation Investment Generating Economic	**Description:**	Investing in critical road, rail, transit and port projects across the nation. Information on this program is available on the website: https://www.transportation.gov/tags/tiger-grants.

Capability		
Recovery (TIGER)	**Responsible Agency:**	U.S. DOT
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Community Facilities Direct Loan & Grant Program	**Description:**	This program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area, and does not include private, commercial or business undertakings. Information on this program is available on the website: https://www.rd.usda.gov/programs-services/community-facilities-direct-loan-grant-program.
	Responsible Agency:	USDA
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Emergency Loan Program	**Description:**	USDA's Farm Service Agency provides emergency loans to help producers recover from production and physical losses due to drought, flooding, other natural disasters or quarantine. Information on this program is available on the website: https://www.fsa.usda.gov/programs-and-services/farm-loan-programs/emergency-farm-loans/index.
	Responsible Agency:	USDA
	Provides Funding for Mitigation:	Yes
	Hazard:	All natural hazards
Emergency Watershed Protection program	**Description:**	The Emergency Watershed Protection (EWP) program provides assistance to relieve imminent hazards to life and property caused by floods, fires, drought, windstorms, and other natural occurrences through the Natural Resources Conservation Service. Information on this program is available on the website: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/.
	Responsible Agency:	USDA
	Provides Funding for Mitigation:	Yes
	Hazard:	All-natural hazards
Financial Assistance	**Description:**	Financial assistance to help plan and implement conservation practices that address natural resource concerns or opportunities to help save energy, improve soil, water, plant, air, animal and related resources on agricultural lands and non-industrial private forest land. Information on this program is available on the website: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/.
	Responsible Agency:	NRCS
	Provides Funding for Mitigation:	Yes
	Hazard:	-

Capability		
Emergency Management Performance Grants (EMPG) Program	**Description:**	Assist local, tribal, territorial, and state governments in enhancing and sustaining all-hazards emergency management capabilities. Information on this program is available on the website: https://www.fema.gov/grants/preparedness/emergency-management-performance.
	Responsible Agency:	U.S. DHS
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Reimbursement for Firefighting on Federal Property	**Description:**	Provides reimbursement only for direct costs and losses over and above normal operating costs. Information on this program is available on the website: https://www.usfa.fema.gov/grants/firefighting_federal_property.html.
	Responsible Agency:	U.S. DHS
	Provides Funding for Mitigation:	Yes
	Hazard:	Fire
Land & Water Conservation Fund	**Description:**	Matching grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities (as well as funding for shared federal land acquisition and conservation strategies). Information on this program is available on the website: https://www.nps.gov/subjects/lwcf/index.htm.
	Responsible Agency:	National Park Service
	Provides Funding for Mitigation:	Yes
	Hazard:	-
State		
New Jersey Clean Energy Program	**Description:**	New Jersey's Clean Energy Program (NJCEP) promotes increased energy efficiency and the use of clean, renewable sources of energy including solar, wind, geothermal, and sustainable biomass. The results for New Jersey are a stronger economy, less pollution, lower costs, and reduced demand for electricity. NJCEP offers financial incentives, programs, and services for residential, commercial, and municipal customers. Refer to https://www.njcleanenergy.com/main/about-njcep/about-njcep for additional details on NJCEP. The program also offers a Community Energy Plan Grant for government entities (e.g. municipality, county, Green Team or environmental commission, or other Sustainable Jersey organization within a community or county). The grant will provide funding for an entity to create a Community Energy Master Plan to align local communities with the State Energy Master Plan
	Responsible Agency:	New Jersey Board of Public Utilities
	Provides Funding for Mitigation:	Yes
	Hazard:	Hazards impacted by climate change
Grant and Loan Programs	**Description:**	NJDEP offers a wide variety of funding opportunities for local governments and other types of organizations to fund numerous environmentally based projects. This includes funding for: air quality, energy, and sustainability; compliance and enforcement; engineering and construction; land use management; local government assistance; natural and historic resources; site remediation and waste management programs; and water resource management.

Capability		
		Information on each of the programs can be found on the NJDEP website: https://www.nj.gov/dep/grantandloanprograms/.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Green Acres Program	**Description:**	Green Acres was created to meet New Jersey's growing recreation and conservation needs. This program has helped preserve over 1.2 million acres of land in New Jersey.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Blue Acres Program	**Description:**	Blue Acres provides funding for acquisition of land in floodways of the Delaware River, Sussex River, and Raritan River and their respective tributaries, for recreation and conservation purposes. Properties (including structures) that have been damaged by, or may be prone to incurring damage caused by, storms or storm-related flooding, or that may buffer or protect other lands from such damage, are eligible for acquisition.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	Flood, Severe Weather
New Jersey Water Bank	**Description:**	The New Jersey Water Bank (NJWB) is a partnership between the NJDEP and the NJEIT to provide low cost financing for the design, construction, and implementation of projects that help protect and improve water quality and help ensure safe and adequate drinking water. The NJWB finances projects by utilizing two funding sources. The Trust issues revenue bonds which are used in combination with zero percent interest funds to provide very low interest loans for water infrastructure improvements. The NJDEP administers a combination of Federal State Revolving Fund capitalization grants, as well as the State's matching funds, loan repayments, State appropriations and interest earned on such funds.
	Responsible Agency:	NJDEP and New Jersey Environmental Infrastructure Trust
	Provides Funding for Mitigation:	Yes
	Hazard:	Flood, Severe Weather
New Jersey Redevelopment Authority	**Description:**	The New Jersey Redevelopment Authority (NJRA) is an independent state financing authority committed exclusively to the redevelopment of New Jersey's urban areas. NJRA offers several financing resources including site acquisition funding, predevelopment assistance, several development assistance resources, and technical assistance.
	Responsible Agency:	-
	Provides Funding for Mitigation:	Yes
	Hazard:	-
New Jersey Department of	**Description:**	The New Jersey Department of Community Affairs (NJDCA) is a state agency created to provide administrative guidance, financial support, and technical assistance to local governments, community development organizations, businesses, and individuals to

Capability		
Community Affairs		improve the quality of life in New Jersey. NJDCA offers a wide range of programs, funding, and services that respond to issues of public concern including fire and building safety, housing production, community planning and development, and local government management and finance. Among other funding sources, NJDCA administers CDBG funding and is typically the CDBG-Disaster Relief funding recipient for the State of New Jersey.
	Responsible Agency:	-
	Provides Funding for Mitigation:	Yes
	Hazard:	-
New Jersey Board of Public Utilities	**Description:**	The New Jersey Board of Public Utilities (BPU) works with private utility companies to provide analysis of natural hazard information affecting the provision of electric power, telecommunications, public water, sewage collection and treatment, and other regulated public utilities. The data are used during response and recovery efforts in the event of emergency or disaster and is also used to analyze impact of mitigation plans and projects. BPU also provides technical assistance for the Energy Resiliency Program
	Responsible Agency:	BPU
	Provides Funding for Mitigation:	Yes
	Hazard:	All
Environmental Infrastructure Financing Program	**Description:**	Qualified borrowers receive loans in two equal parts: Approximately one half to three quarters comes from a 0-interest State Revolving Fund maintained by the NJDEP. The other portion comes from proceeds of highly rated tax-exempt revenue bonds sold by the Trust. Combining these two funds results in a loan that is 50 to 75% lower than traditional loan rates.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	-
New Jersey Small Cities Communities Development Block Grants	**Description:**	The New Jersey Small Cities Communities Development Block Grants provide funds for economic development, housing rehabilitation, community revitalization, and public facilities designated to benefit people with low and moderate incomes, or to address recent local needs for which no other source of funding is available to non-entitlement counties and municipalities. Information on the program is available on the website: https://www.nj.gov/dca/divisions/dhcr/offices/neighborhood.html.
	Responsible Agency:	NJDCA
	Provides Funding for Mitigation:	Yes
	Hazard:	-
New Jersey Conservation Foundation	**Description:**	The New Jersey Conservation Foundation (NJCF) is a private, not-for-profit organization. Through acquisition and stewardship, NJCF protects strategic lands, promotes strong land use policies, and forges partnerships to achieve conservation goals. Grants to help fund preservation activities. Information on the program is available on the website: https://www.njconservation.org/what-we-do/.
	Responsible Agency:	NJCF

Capability		
	Provides Funding for Mitigation:	Yes
	Hazard:	-
The New Jersey Infrastructure Bank	**Description:**	Two programs provide and administer low interest rate loans to qualified municipalities, counties, regional authorities, and water purveyors in New Jersey. Approximately $350 million is awarded annually. 1. NJEIT for the purpose of financing water quality infrastructure projects that enhance ground and surface water resources, ensure the safety of drinking water supplies, protect the public health and make possible responsible and sustainable economic development. 2. The New Jersey Transportation Infrastructure Bank (NJTIB) is an independent State Financing Authority responsible for providing and administering low interest rate loans to qualified municipalities, counties, and regional authorities in New Jersey for the purpose of financing transportation quality infrastructure projects. Information on the program is available on the website: https://www.njib.gov/.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	-
Drinking Water State Revolving Fund	**Description:**	The DWSRF program assists water systems in financing the cost of infrastructure through the use of federal and New Jersey Infrastructure Trust funds. Additionally, the Water Supply program provides operator licensing and training support as well as financial assistance through the DWSRF program. Information on the program is available on the website: https://www.state.nj.us/dep/watersupply/dws_loans.html.
	Responsible Agency:	NJDEP
	Provides Funding for Mitigation:	Yes
	Hazard:	-
New Jersey Department of Transportation (NJDOT)	**Description:**	Funding of the Program is typically federal through the Federal Highway Administration or State through the Transportation Trust Fund. Information on the program is available on the website: https://www.state.nj.us/transportation/business/localaid/funding.shtm.
	Responsible Agency:	NJDOT
	Provides Funding for Mitigation:	Yes
	Hazard:	-
NJ Highlands Council – Open Space Partnership	**Description:**	The Highlands Open Space Partnership Funding program is a matching grant program designed to support the acquisition of property for the protection of resources within the Highlands Region, and to further the goals of landowner equity as specified in the Highlands Water Protection and Planning Act of 2004 and the Highlands Regional Master Plan. The Highlands Council shall provide a maximum grant award of 50% of the total purchase price of the property. Applications will be considered for acquisition of property in fee simple or through conservation easements for any passive recreation or conservation purposes. See program details below for complete information.
	Responsible Agency:	NJ Highlands Council. State agencies, Highlands county or municipal governments, and charitable conservancies are eligible to apply.

Capability		
	Provides Funding for Mitigation:	Yes – open space
	Hazard:	-
NJ Highlands Council – Plan Conformance Grants	**Description:**	Plan Conformance Grants provide funding to support costs associated with Plan Conformance activities (i.e. engagement of professionals and staff in the development of required Plan Conformance components).
	Responsible Agency:	Municipalities in the Highlands Region, as defined by the Highlands Act (Planning or Preservation Area), that have submitted a duly-adopted Notice of Intent to petition Highlands Council in accordance with the Council's Plan Conformance Guidelines.
	Provides Funding for Mitigation:	Yes
	Hazard:	Harmful Algal Bloom
NJ Highlands – Transfer of Development Rights	**Description:**	Transfer of Development Rights (TDR) is a land-use tool that encourages transfer of development potential from areas a community wants to preserve (Sending Zones) to areas where growth is desired (Receiving Zones). The Highlands Act mandated the creation of a TDR program as an effective means of addressing landowner equity while advancing planning goals of the Act.
	Responsible Agency:	Any municipality in New Jersey can apply for funding.
	Provides Funding for Mitigation:	Yes
	Hazard:	-
County and Local		
Sussex County Farmland Preservation, Recreation, and Open Space Trust Fund	**Description:**	The Farmland Preservation, Recreation, and Open Space Trust Fund is divided into two separate categories, each having its own distinct goals and objectives. The Farmland Preservation Program uses Trust Fund dollars to purchase development easements on farm land, forever protecting the agriculture use. The Open Space program uses Trust Fund dollars to acquire land and/or water areas for the protection of ecologically sensitive areas; preservation of areas of scenic, cultural or historic value; public outdoor recreational facilities (active or passive); preservation of lands of exceptional flora or fauna; and for the protection of critical water supplies. The Trust Fund cannot be used for construction and development of mitigation projects and is strictly used to acquire open space. Projects are selected through an open and competitive process, governed by state and local statutes. Funds can only be used to purchase land in Sussex County from willing sellers on a voluntary basis. The county does not condemn property if the owner is unwilling to sell. The Trust Fund is funded through a property tax assessment determined annually by the Board of Chosen Commissioners.
	Responsible Agency:	Board of Chosen Commissioners, Open Space Advisory Committee
	Provides Funding for Mitigation:	Yes
	Hazard:	All

5.5 PLAN INTEGRATION

Described earlier in this section and within each annex, participating jurisdictions identified integration of hazard risk management into their existing planning, regulatory, and operational/administrative framework ("integration capabilities") and intended integration promotion (integration actions). Volume II, Section 9

(Jurisdictional Annexes) provides details on how each jurisdiction integrates hazard mitigation into their existing capabilities.

5.5.1 INTEGRATION PROCESS

Hazard mitigation is a sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. Integrating hazard mitigation into a community's existing plans, policies, codes, and programs leads to development patterns that do not increase risk from known hazards or leads to redevelopment that reduces risk from known hazards. The Sussex County Planning Partnership was tasked with identifying how hazard mitigation is integrated into existing planning mechanisms. Section 9 (Jurisdictional Annexes) details how this is done for each participating municipality and the County. During this process, many municipalities recognized the importance and benefits of incorporating hazard mitigation into future municipal planning and regulatory processes and have added new mitigation actions to support this effort.

The Planning Partnership representatives will continue to incorporate mitigation planning as an integral component of daily government operations. Planning Partnership representatives will continue to work with local government officials to integrate the newly adopted hazard mitigation goals and actions into the general operations of government and partner organizations. Further, the sample adoption resolution presented in Appendix A (Plan Adoption) includes a resolution item stating the intent of the local governing body to incorporate mitigation planning as an integral component of government and partner operations. By doing so, the Planning Partnership anticipates that:

1. Hazard mitigation planning will be formally recognized as an integral part of overall planning and emergency management efforts.
2. The Hazard Mitigation Plan, Master Plans, Emergency Management Plans, and other relevant planning mechanisms will become mutually supportive documents that work in concert to meet the goals and needs of County residents.

Section 7 (Plan Maintenance) provides for additional information on the implementation of the mitigation plan through existing programs.

SECTION 6. MITIGATION STRATEGY

This section presents the process by which Sussex County will reduce or eliminate potential losses from the hazards identified in Section 4.1 (Identification of Hazards) of this HMP. The mitigation strategy focuses on existing and potential future mitigation actions to alleviate the effects of hazards on Sussex County's population, economy, environment and general building stock.

The Planning Partnership reviewed the results of the risk assessment and capability assessment to identify and develop mitigation actions. This section includes the following. Individual actions are listed within Section 9 (Jurisdictional Annexes).

1. Background and Past Mitigation Accomplishments
2. General Planning Approach
3. Review and Update of Mission Statement, Mitigation Goals and Objectives
4. Mitigation Strategy Development

Hazard mitigation reduces the potential impacts of, and costs associated with, emergency and disaster-related events. Mitigation actions address a range of impacts, including impacts on the population, property, the economy, and the environment.

Mitigation actions can include activities such as: revisions to land-use planning, training and education, and structural and nonstructural safety measures.

2021 HMP Changes

- The goals and objectives were updated to align with County and local priorities.
- The capability assessment was moved to Section 5.
- A Strengths, Weaknesses, Obstacles and Opportunities exercise was conducted for the high-ranked hazards to inform the updated mitigation strategy.
- A mitigation toolbox was compiled and distributed to assist with the mitigation strategy update.

6.1 BACKGROUND AND PAST MITIGATION ACCOMPLISHMENTS

In accordance with the requirements of the DMA 2000, a discussion regarding past mitigation activities and an overview of past efforts is provided as a foundation for understanding the mitigation goals, objectives, and activities outlined in this plan update. Sussex County, through previous and ongoing hazard mitigation activities, has demonstrated that it is proactive in protecting its physical assets and citizens against losses from natural hazards. Examples of previous and ongoing Sussex actions and projects include the following. Refer to Section 9.2 through 9.25 for mitigation accomplishments by each municipality.

- The County continues to incorporate hazard mitigation considerations and priorities into various plan updates and integrate the County Master Plan with the County HMP during the Master Plan Update.
- The County works to design and implement a mitigation awareness campaign through County Planning or Rutgers Extension to Farms/Tree Farms regarding the ingestion pathway response for the radiological hazard.
- The County coordinates with the Sussex County College FM Radio Station to disseminate preparedness information.
- County staff participate in the Emergency Preparedness Conference and workshops.

6.2 GENERAL MITIGATION PLANNING APPROACH

The overall approach used to update the County and local hazard mitigation strategies are based on FEMA and State of New Jersey regulations and guidance regarding local mitigation plan development, including the following:

- DMA 2000 regulations, specifically 44 CFR 201.6 (local mitigation planning).
- FEMA *Local Mitigation Planning Handbook*, March 2013.
- FEMA *Local Mitigation Plan Review Guide*, October 1, 2011.
- FEMA *Integrating Hazard Mitigation into Local Planning*, March 1, 2013.
- FEMA *Plan Integration: Linking Local Planning Efforts*, July 2015.
- FEMA *Mitigation Planning How-To Guide #3, Identifying Mitigation Actions and Implementing Strategies* (FEMA 386-3), February 2013.
- FEMA *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*, January 2013.

The mitigation strategy update approach includes the following steps that are further detailed in later subsections of this section:

- Section 6.3 – Strengths, Weaknesses, Obstacles and Opportunities (SWOO) exercise
- Section 6.4 – Stakeholder Surveys
- Section 6.5 – Review and update the mitigation goals and objectives
- Section 6.6 – Prepare an implementation strategy, including:
    - Identification of progress on previous County and local mitigation strategies
    - Development of updated County and local mitigation strategies, and
    - Prioritization projects and initiatives in the updated mitigation strategy

6.3 STRENGTHS, WEAKNESSES, OBSTACLES AND OPPORTUNITIES EXERCISE

The Steering Committee participated in a Strengths, Weaknesses, Obstacles and Opportunities (SWOO) exercise focusing on the high-ranked countywide hazards to update the strengths, weaknesses, obstacles and opportunities last conducted in 2016. The discussion of each hazard began with identifying County, local jurisdiction and stakeholder strengths to mitigate the risk and potential future impacts of these hazards. Next, the weaknesses, challenges and obstacles the planning area faces to reduce each hazard's risk were identified. To conclude the discussion of each high-ranked hazard, the Steering Committee members were asked to identify potential opportunities for enhanced mitigation.

SWOO results were recorded to assist with the problem statement development to update to the mitigation strategy. Refer to Appendix B (Participation Documentation) which provides the information captured for each hazard during the SWOO exercise.

6.4 STAKEHOLDER SURVEYS

As discussed in Section 2 (Planning Process), stakeholder surveys were developed and distributed to solicit input regarding vulnerabilities, capabilities and mitigation projects. The County distributed directly via email to identified points of contact in the following sectors. In addition, all Planning Partners were asked to distribute broadly within their jurisdictions.

- Academia
- Emergency services

- Transportation/Department of Public Works
- Utilities
- Hospital and health care
- Business/commerce
- Social services
- General - for planning agencies and other stakeholders that do not fit within one of the above categories

Information gathered from these surveys was shared with all plan participants and used to inform the updated mitigation strategy development and finalization of the annexes (Section 9). Refer to Appendix D (Public and Stakeholder Outreach) for a copy of the survey results.

6.5 REVIEW AND UPDATE OF MITIGATION GOALS AND OBJECTIVES

This section documents the County's efforts to develop hazard mitigation goals and objectives that are established to reduce or avoid long-term vulnerabilities to the identified hazards.

6.5.1 GOALS AND OBJECTIVES

According to CFR 201.6(c)(3)(i): "The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards." The mitigation goals were developed based on the risk assessment results, discussions, research, and input from the Steering and Planning Committees, existing authorities, polices, programs, resources, stakeholders, and the public.

The Steering Committee reviewed the 2016 HMP goals and objectives at the August 2020 Steering Committee kickoff meeting. The updated goals and objectives were then presented to the Planning Partnership at the September 2020 municipal kickoff meeting. The goals and objectives were updated in consideration of the hazard events and losses since the 2016 plan, the goals and objectives established in the updated State HMP, county and local risk management plans/priorities, as well as direct input from the Steering Committee (representing the County and participating jurisdictions) recognizing the need to move forward to best manage their hazard risk.

FEMA defines ***Goals*** as general guidelines that explain what should be achieved. Goals are usually broad, long-term, policy statements, and represent a global vision.

FEMA defines ***Objectives*** as strategies or implementation steps to attain mitigation goals. Unlike goals, objectives are specific and measurable, where feasible.

FEMA defines ***Mitigation Actions*** as specific actions that help to achieve the mitigation goals and objectives.

For the purposes of this plan, goals and objectives are defined as follows:

Goals are general guidelines that explain what is to be achieved. They are broad, long-term, policy-type statements that represent global visions. Goals help define the benefits that the plan is trying to achieve. The success of the plan, once implemented, should be measured by the degree to which its goals have been met (that is, by the actual benefits in terms of hazard mitigation).

Objectives are short-term aims, which when combined form a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

The goals and objectives update provides clear guidelines for how the County and all jurisdictions can move forward to best manage their hazard risk. Amendments include additions and edits to goals and objectives to express the plan participants' interests in integrating this plan with other planning mechanisms/programs and to support mitigation through the protection and preservation of natural systems, incorporate resilience of lifelines, and integrate green infrastructure.

As a result of this review process, the goals and objectives for the 2021 update were amended as presented in Table 6-1. *Italicized* text indicates the updates made to the goals and objectives. A new goal was added and move to Goal #1, and the goals and objectives that follow were renumbered. Although an objective is listed with each goal, the objectives were developed to meet multiple goals as demonstrated in Table 6-2.

Table 6-1. Sussex County Mitigation Goals and Objectives

Goal	Objective Statement
Goal 1: **Protect life**	1.1: Identify the need for, and acquire, any special health and emergency services, training, and equipment to enhance response and recovery capabilities for specific hazards to vulnerable populations
	1.2: Maintain and enhance local regulatory standards including full and effective building code enforcement, floodplain management and other vulnerability-reducing regulations
	1.3: Develop, enhance and protect early warning and emergency communications systems
	1.4: Identify and train non-traditional first responders to increase response capabilities
Goal 2: **Protect property**	2.1: Pursue cost-effective mitigation actions to reduce the impacts of hazards on people, property and the economy
	2.2: Preserve, restore and enhance natural environmental resources including open space and agricultural resources that serve a natural hazard mitigation function
	2.3: Facilitate the development and timely submittal of project applications meeting state and federal guidelines for funding to reduce the number of repetitive and severe repetitive loss properties and hardening/retrofitting infrastructure, critical facilities *and lifelines* with identified needs
	2.4: *Encourage the use of green stormwater infrastructure to mitigate flooding and improve water quality*
Goal 3: **Increase preparedness and awareness**	3.1: Increase awareness of hazard risks and understanding of the advantages of mitigation to the general public, business and community members, and by local government officials
	3.2: Increase local government official awareness regarding funding opportunities for mitigation
	3.3: Provide government officials and local practitioners with educational opportunities and information regarding best practices for hazard mitigation planning, project identification, and implementation
	3.4: *Increase awareness of dam ownership and available mitigation funding for dams*
Goal 4: **Develop and maintain an understanding of risks from hazards**	4.1: Improve data collection and sharing; and increase data availability to the county and municipalities to reduce the impacts of hazards and for use in future planning efforts
	4.2: Acquire and maintain detailed data regarding critical facilities, *lifelines* and infrastructure such that these sites can be prioritized and risk-assessed for possible mitigation actions
	4.3: Continue support of hazard mitigation planning, project identification, and implementation at the municipal and county level
	4.4: *Strengthen understanding of, and adaptation to, a changing climate*
Goal 5: **Enhance mitigation capabilities to reduce hazard vulnerabilities**	5.1: Support increased participation in the National Flood Insurance Program Community Rating System
	5.2: Support increased integration of municipal/county hazard mitigation planning and floodplain management with effective municipal zoning regulation, and effective municipal/county subdivision regulation, and comprehensive planning
	5.3: Provide user-friendly hazard-data accessibility for mitigation planning, other planning efforts and for private citizens

Goal	Objective Statement
	5.4: Provide direct support, where possible, to municipal mitigation programs
Goal 6: Support continuity of operations pre-, during, and post-hazard events	6.1: Ensure continuity of operations of government, non-government, commerce, private sector, and infrastructure
	6.2: Support and encourage the implementation of back-up and alternative energy sources
	6.3: Develop, enhance and identify systems and procedures to help facilitate and prioritize an expedient response during disaster recovery efforts
Goal 7: *Address Long-Term Vulnerabilities from High Hazard Dams*	7.1: *Ensure dam infrastructure is maintained*
	7.2: *Ensure EAPs are maintained and updated*
	7.3: *Support the identification and access to funding to repair/replace dams*

6.6 MITIGATION STRATEGY DEVELOPMENT AND UPDATE

6.6.1 REVIEW OF 2016 HMP MITIGATION ACTION PLAN

To evaluate progress on local mitigation actions, the planning consultant met with each participant to discuss the status of the mitigation actions identified in the 2016 plan. For each action, jurisdictions were asked to provide the status of each action (*No Progress, In Progress, Ongoing Capability, Discontinue, or Completed*) and provide review comments on each. Jurisdictions were requested to quantify the extent of progress and provide reasons for the level of progress or why actions were being discontinued. Each jurisdictional annex in Section 9 (Jurisdictional Annexes) provides a table identifying the jurisdiction's prior mitigation strategy, the status of those actions and initiatives, and their disposition within their updated strategy.

Local mitigation actions identified as *Complete*, and those actions identified as *Discontinued*, were removed from the updated strategies. Local mitigation actions identified as an *Ongoing Capability* were incorporated into the capability assessment of each jurisdictional annex. Those actions identified as *No Progress* or *In Progress* that remain a priority for the jurisdiction, have been carried forward into the updated mitigation strategy.

At the September 2020 kickoff meeting and during subsequent local-level planning meetings (phone, email, in-person local support meetings), all participating jurisdictions were requested to identify mitigation activities completed, ongoing, and potential/proposed. As new potential mitigation actions, projects, or initiatives became evident during the plan update process, including as part of the risk assessment update and as identified through the public and stakeholder outreach process detailed in Section 2 (Planning Process), jurisdictions were made aware of these either through direct communication (local meetings, email, phone), at Steering and Planning Committee meetings, or via their draft jurisdictional annexes.

Throughout the planning process, jurisdictions worked with the planning consultant to assist with the development and update of their annex and include mitigation strategies, focusing on identifying well-defined, implementable projects with a careful consideration of benefits (risk reduction, losses avoided), costs, and possible funding sources (including mitigation grant programs).

6.6.2 IDENTIFICATION AND ANALYSIS OF MITIGATION TECHNIQUES

Concerted efforts were made to assure that the jurisdictions develop updated mitigation strategies that included activities and initiatives covering the range of mitigation action types described in recent FEMA planning guidance (FEMA *Local Mitigation Planning Handbook* March 2013), specifically:

- Local Plans and Regulations—These actions include government authorities, policies, or codes that influence the way land and buildings are being developed and built.
- Structure and Infrastructure Projects—These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures, as well as critical facilities and infrastructure. This type of action involves projects to construct manmade structures to reduce the impact of hazards.
- Natural Systems Protection—These are actions that minimize damage and losses and preserve or restore the functions of natural systems.
- Education and Awareness Programs—These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions could include participation in national programs, such as the National Flood Insurance Program and Community Rating System, StormReady (NOAA), and Firewise (NFPA) Communities.

6.6.3 2021 HMP MITIGATION ACTION PLAN

To help support the selection of an appropriate, risk-based mitigation strategy, each annex was updated to provide a summary of hazard vulnerabilities identified during the plan update process, either directly by local representatives or through review of available County and local plans and reports, and through the hazard profiling and vulnerability assessment process.

A mitigation strategy workshop was co-led by NJOEM-Mitigation Unit and the contracted planning consultant on November 12, 2020, for all participating jurisdictions to support the development of the updated mitigation strategy. To assist with the identification of implementable and action-oriented mitigation actions, a three-step process was followed for the 2021 HMP update: 1) Assemble a 'mitigation toolbox'; 2) Identify problem statements through 'mitigation brainstorming' and 3) Update the mitigation action plan. This section describes the process followed by the County and the jurisdictions to develop the 2021 updated mitigation action plan.

The concept of a 'mitigation toolbox' was introduced to the Planning Partnership at the October 2020 risk assessment meeting. A mitigation toolbox contains numerous resources available to the County and participating jurisdictions to assist with the development of an updated mitigation action plan. This toolbox was referred to throughout the 2021 HMP mitigation strategy update. All materials were made available to all participants to access and will continue to serve as a resource over the plan performance period. The toolbox contains, but is not limited, to the following and will be continuously added to over time:

- 2021 HMP goals and objectives
- 2016 HMP Mitigation Strategy
- Risk assessment results
- Capability assessment results
- Outcomes of the SWOO
- Mitigation Catalog
- Subject-matter expertise
- Stakeholder and public input (e.g., citizen survey and stakeholder survey results)
- Existing plans/policies/programs
- FEMA resources (e.g., Mitigation Ideas).

As discussed in Section 2 (Planning Process) and earlier in this section, the October 2020 risk assessment meeting and individual jurisdiction meetings were focused on understanding risk and capabilities and identify gaps in capabilities, challenges and opportunities. This provided context for the next steps in the update of the mitigation strategy and inform the Planning Partnership of the available resources in their 'toolbox.'

At the November 2020 Mitigation Strategy Workshop, the Planning Partnership developed problem statements based on the impacts of hazards in the County. The results of the updated risk assessment, challenges and opportunities identified during the capability assessment update and SWOO sessions, and information gathered from the citizen survey were used to inform problem statement development. This workshop was held remotely due to the coronavirus pandemic. Jurisdictions then had follow-up phone calls with the planning consultant to brainstorm and develop mitigation actions. Information gathered from the citizen and stakeholder surveys were shared with the Planning Partnership to further inform the updated mitigation strategy development.

As a result, problem statements were developed to detail the problems/challenges/gaps/identified vulnerabilities the jurisdiction faces. Mitigation alternatives were then evaluated to best reduce future risk and address the identified problem. These problem statements were intended to provide a detailed description of the problem area, including impacts to the jurisdiction, past damages, and loss of service. These problem statements helped form a bridge between the hazard risk assessment, which quantifies impacts to each community, with the development of achievable mitigation strategies.

A strong effort has been made to better focus local mitigation strategies to clearly defined, readily implementable projects and initiatives that meet the definition or characteristics of mitigation. Broadly defined mitigation actions were eliminated from the updated strategy unless accompanied by discrete actions, projects, or initiatives.

Certain continuous or ongoing strategies that represent programs that are fully integrated into the normal operational and administrative framework of the community have been identified within the capabilities section of each annex and removed from the updated mitigation strategy.

Throughout the course of the plan update process, additional regional and county-level mitigation actions were identified by the following processes:

- Review of the results and findings of the updated risk assessment.
- Review of available regional and county plans reports and studies;
- Direct input from county departments and other county and regional agencies
- Input received through the public and stakeholder outreach process.

6.7 MITIGATION BEST PRACTICES

Catalogs of hazard mitigation best practices were developed that present a broad range of alternatives to be considered for use in Sussex County, in compliance with 44 CFR Section 201.6(c)(3)(ii). One catalog was developed for each natural hazard of concern evaluated in this plan; referred to as the Mitigation Catalog (Appendix F). The catalogs present alternatives that are categorized in two ways:

- By whom would have responsibility for implementation:
  - Individuals – personal scale
  - Businesses – corporate scale
  - Government – government scale
- By what each of the alternatives would do:
  - Manipulate the hazard
  - Reduce exposure to the hazard
  - Reduce vulnerability to the hazard
  - Build local capacity to respond to or be prepared for the hazard

The alternatives presented include actions that will mitigate current risk from hazards and actions that will help reduce risk from changes in the impacts of these hazards resulting from climate change. Hazard mitigation actions recommended in this plan were selected from among the alternatives presented in the catalog, as well as

other resources made available to all jurisdictions (i.e., FEMA's Mitigation Ideas). The catalog provides a baseline of mitigation alternatives that are backed by a planning process, are consistent with the established goals and objectives, and are within the capabilities of the planning partners to implement. Some of these actions may not be feasible based on the selection criteria identified for this plan. The purpose of the catalog was to provide a list of what could be considered to reduce risk from natural hazards within the planning area. Actions in the catalog that are not included for the partnership's action plan were not selected for one or more of the following reasons:

- The action is not feasible
- The action is already being implemented
- There is an apparently more cost-effective alternative
- The action does not have public or political support.

6.8 MITIGATION STRATEGY EVALUATION AND PRIORITIZATION

Section 201.c.3.iii of 44 CFR requires an action plan describing how mitigation actions identified will be prioritized. The County and participating jurisdictions utilized a modified STAPLEE (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) mitigation action evaluation methodology based on a set of evaluation criteria suited to the purposes of hazard mitigation strategy evaluation. This method provides a systematic approach that considers the opportunities and constraints of implementing a specific mitigation action.

The Steering Committee applied an action evaluation methodology, which includes an expanded set of 14 criteria to include the consideration of cost-effectiveness, availability of funding, anticipated timeline, and if the action addresses multiple hazards. The 14 evaluation criteria used in the 2021 update process is the same used in the 2016 plan:

1. Life Safety—How effective will the action be at protecting lives and preventing injuries?
2. Property Protection—How significant will the action be at eliminating or reducing damage to structures and infrastructure?
3. Cost-Effectiveness—Are the costs to implement the project or initiative commensurate with the benefits achieved?
4. Technical—Is the mitigation action technically feasible? Is it a long-term solution? Eliminate actions that, from a technical standpoint, will not meet the goals.
5. Political—Is there overall public support for the mitigation action? Is there the political will to support it?
6. Legal—Does the jurisdiction have the authority to implement the action?
7. Fiscal—Can the project be funded under existing program budgets (i.e., is this initiative currently budgeted for)? Would it require a new budget authorization or funding from another source such as grants?
8. Environmental–What are the potential environmental impacts of the action? Will it comply with environmental regulations?
9. Social—Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?
10. Administrative—Does the jurisdiction have the personnel and administrative capabilities to implement the action and maintain it? Will outside help be necessary?
11. Multi-hazard—Does the action reduce the risk to multiple hazards?
12. Timeline—Can the action be completed in less than 5 years (within our planning horizon)?
13. Local Champion—Is there a strong advocate for the action or project among the jurisdiction's staff, governing body, or committees that will support the action's implementation?

14. Other Local Objectives—Does the action advance other local objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of other plans and programs?

Specifically, for each mitigation action, the jurisdictions were asked to assign a numeric rank (-1, 0, or 1) for each of the 14 evaluation criteria, defined as follows:

- 1 = Highly effective or feasible
- 0 = Neutral
- -1 = Ineffective or not feasible

Further, jurisdictions were asked to provide a summary of the rationale behind the numeric rankings assigned, as applicable. The numerical results were totaled to assist each jurisdiction in selecting mitigation actions for the updated plan.

As step one in the prioritization process, actions that had a numerical value between 0 and 4 were initially prioritized as *low*; actions with numerical values between 5 and 9 were initially categorized as *medium*; and actions with numerical values between 10 and 14 were initially categorized as *high*. As step two, jurisdictions were then asked to consider the benefits and costs, as well as the desired timeline for implementation and project completion timeline when finalizing each action's priority as *high/medium/low*. These attributes are included in the mitigation strategy table and for FEMA-eligible projects in the mitigation worksheets (Section 9 – Jurisdictional Annexes).

In addition, municipalities were asked to identify the most important project(s) that they would like to begin implementation on as quickly as possible once resources are available. These actions are listed at the beginning of the list of proposed mitigation actions for each annex.

For the plan update there has been an effort to develop more clearly defined and action-oriented mitigation strategies. These local strategies include projects and initiatives that are seen by the community as the most effective approaches to advance their local mitigation goals and objectives within their capabilities. In addition, each jurisdiction was asked to develop problem statements. With this process, participating jurisdictions were able to develop action-oriented and achievable mitigation strategies.

6.9 BENEFIT/COST REVIEW

Section 201.6.c.3iii of 44 CFR requires the prioritization of the action plan to emphasize the extent to which benefits are maximized according to a cost/benefit review of the proposed projects and their associated costs. Stated otherwise, cost-effectiveness is one of the criteria that must be applied during the evaluation and prioritization of all actions comprising the overall mitigation strategy.

The benefit/cost review applied in for the evaluation and prioritization of projects and initiatives in this plan update process was qualitative; that is, it does not include the level of detail required by FEMA for project grant eligibility under the Hazard Mitigation Assistance (HMA) grant programs. For all actions identified in the local strategies, jurisdictions have identified both the costs and benefits associated with project, action or initiative.

Costs are the total cost for the action or project, and could include administrative costs, construction costs (including engineering, design and permitting), and maintenance costs.

Benefits are the savings from losses avoided attributed to the implementation of the project, and could include life-safety, structure and infrastructure damages, loss of service or function, and economic and environmental damage and losses.

When possible, jurisdictions were asked to identify the actual or estimated dollar costs and associated benefits. Often numerical costs and/or benefits were not identified and may be impossible to quantify. In this case, jurisdictions were asked to evaluate project cost-effectiveness using *high*, *medium*, and *low* ratings. Where estimates of costs and benefits were available, the ratings were defined as the following:

Low <= $10,000 Medium = $10,000 to $100,000 High >=$100,000

Where quantitative estimates of costs and/or benefits were not available, qualitative ratings using the following definitions were used:

Table 6-2. Qualitative Cost and Benefit Ratings

Costs	
High	Existing funding levels are not adequate to cover the costs of the proposed project, and implementation would require an increase in revenue through an alternative source (e.g., bonds, grants, and fee increases).
Medium	The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
Low	The project could be funded under the existing budget. The project is part of or can be part of an existing, ongoing program.
Benefits	
High	Project will have an immediate impact on the reduction of risk exposure to life and property.
Medium	Project will have a long-term impact on the reduction of risk exposure to life and property or will provide an immediate reduction in the risk exposure to property.
Low	Long-term benefits of the project are difficult to quantify in the short term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low) are considered cost-effective. For some of the Sussex County initiatives identified, the planning partnership might seek financial assistance under FEMA's HMA programs. These programs require detailed benefit/cost analysis as part of the application process. These analyses will be performed when funding applications are prepared, using the FEMA benefit/cost analysis model process. The planning partnership is committed to implementing mitigation strategies with benefits that exceed costs. For projects not seeking financial assistance from grant programs that require this sort of analysis, the planning partnership reserves the right to define "benefits" according to parameters that meet its needs and the goals and objectives of this plan.

SECTION 7. PLAN MAINTENANCE PROCEDURES

This section details the formal process that will ensure that the HMP remains an active and relevant document and that the Planning Partnership maintains their eligibility for applicable funding sources. The plan maintenance process includes a schedule for monitoring and evaluating the plan annually and producing an updated plan every five years. In addition, this section describes how public participation will be integrated throughout the plan maintenance and implementation process. It explains how the mitigation strategies outlined in this plan update will be incorporated into existing planning mechanisms and programs, such as comprehensive land use planning processes, capital improvement planning, and building code enforcement and implementation. The plan's format allows sections to be reviewed and updated when new data become available, resulting in a plan that will remain current and relevant.

The plan maintenance matrix shown in Table 7-1 provides a synopsis of responsibilities for plan monitoring, evaluation, and update, which are discussed in further detail in the sections below.

Table 7-1. Plan Maintenance Matrix

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
Monitoring	Preparation of status updates and action implementation tracking as part of submission for Annual Progress Report.	September or upon major update to Comprehensive Plan or major disaster	Jurisdictional points of contact identified in Section 8 (Planning Partnership) and Section 9 (Jurisdictional Annexes)	Jurisdictional implementation lead identified in Section 8 (Planning Partnership) and Section 9 (Jurisdictional Annexes)
Integration	In order for integration of mitigation principles to become an organic part of the ongoing county, municipal, and local authority activities, the county will incorporate the distribution of the Safe Growth Worksheet (see subsection 7.1.2 and Table 7-2 below) for annual review and update by all participating jurisdictions.	September each year with interim email reminders to address integration in county, municipal, and local authority activities.	Sussex County HMP Coordinator and jurisdictional points of contact identified in Section 8 (Planning Partnership) and Section 9 (Jurisdictional Annexes)	HMP Coordinator
Evaluation	Review the status of previous actions as submitted by the monitoring task lead and support to assess the effectiveness of the plan (BATool[SM] or manual); compile and finalize the Annual Progress Report	Finalized progress report completed by September of each year	Sussex County Steering Committee	Jurisdictional points of contacts identified in Section 9 (Jurisdictional Annexes)
Linkage	Non-participating jurisdictions requesting to 'link' into the plan need to complete procedures outlined in Appendix H	Notify the County HMP Coordinator by April and complete linkage package by September the same year	HMP Coordinator and non-participating jurisdiction	Steering Committee
Update	Reconvene the planning partners, at a minimum, every	Every 5 years or upon major update to	Sussex County HMP Coordinator	Jurisdictional points of contacts identified

Task	Approach	Timeline	Lead Responsibility	Support Responsibility
	5 years to guide a comprehensive update to review and revise the plan.	Comprehensive Plan or major disaster		in Section 9 (Jurisdictional Annexes)

7.1 MONITORING EVALUATING AND UPDATING THE PLAN

The procedures for monitoring, evaluating, and updating the plan are provided below.

The HMP Coordinator is assigned to manage the maintenance and update of the plan during its performance period. The HMP Coordinator will chair the Planning Partnership (Steering Committee and municipal points of contact) and be the primary point of contact for questions regarding the plan and its implementation as well as to coordinate incorporation of additional information into the plan.

The Planning Partnership shall fulfill the monitoring, evaluation and updating responsibilities identified in this section which is comprised of a representative from each participating jurisdiction. Each jurisdiction is expected to maintain a representative on the Planning Partnership throughout the plan performance period (five years from the date of plan adoption). As of the date of this plan, primary and secondary mitigation planning representatives (points-of-contact) are identified in each jurisdictional annex in Section 9 (Jurisdictional Annexes).

Regarding the composition of the committee, it is recognized that individual commitments change over time, and it shall be the responsibility of each jurisdiction and its representatives to inform the HMP Coordinator of any changes in representation. The HMP Coordinator will strive to keep the committee makeup as a uniform representation of planning partners and stakeholders within the planning area.

Currently, the Sussex County HMP Coordinator is designated as:

Robert Haffner, Director
Sussex County Division of Emergency Management
135 Morris Turnpike, Newton, NJ 07860
973-579-0380

7.1.1 MONITORING

The Planning Partnership shall be responsible for monitoring progress on, and evaluating the effectiveness of, the plan, and documenting annual progress. Each year, beginning one year after plan development, Sussex County and local Planning Partnership representatives will collect and process information from the departments, agencies and organizations involved in implementing mitigation projects or activities identified in their jurisdictional annexes (Section 9) of this plan, by contacting persons responsible for initiating and/or overseeing the mitigation projects.

In the first year of the performance period, this will be accomplished by utilizing an online performance progress reporting system, the BATool^{SM} which will enable local and county representatives direct access to mitigation initiatives to easily update the status of each project, document successes or obstacles to implementation, add or delete projects to maintain mitigation project implementation. It is anticipated that all participating partners will be prompted by the tool to update progress on a quarterly basis, providing an incentive for participants to refresh their mitigation strategies and to continue implementation of projects. It is expected that this reporting system will support the submittal of an increased number of project grant fund applications due to the functionality of the system which facilitates the sorting and prioritization of projects.

In addition to progress on the implementation of mitigation actions, including efforts to obtain outside funding; and obstacles or impediments to implementation of actions, the information that Planning Partnership representatives shall be expected to document, as needed and appropriate include:

- Any grant applications filed on behalf of any of the participating jurisdictions (which may be documented in the BATool[SM]),
- Hazard events and losses occurring in their jurisdiction,
- Additional mitigation actions believed to be appropriate and feasible (which may be documented in the BATool[SM]),
- Public and stakeholder input.
- Plan monitoring for years 2 through 4 of the plan performance periods will be similarly addressed via the BATool[SM] or manually.

7.1.2 INTEGRATION PROCESS OF THE HMP INTO PLANNING MECHANISMS

Hazard mitigation is sustained action taken to reduce or eliminate the long-term risk to human life and property from natural hazards. Integrating hazard mitigation into a jurisdiction's existing plans, policies, codes, and programs leads to development patterns that do no increase risk from known hazards or leads to redevelopment that reduces risk from known hazards. The Sussex County Planning Partnership was tasked with identifying how hazard mitigation is integrated into existing planning mechanisms. Refer to the Capability Assessments in Section 9 (Jurisdictional Annexes) for how this is done for each participating jurisdiction. During this process, many jurisdictions recognized the importance and benefits of incorporating hazard mitigation into future local planning and regulatory processes.

The Planning Partnership representatives will incorporate mitigation planning as an integral component of daily government operations. Planning Partnership representatives will work with their government officials to integrate the newly adopted hazard mitigation goals and actions into the general operations of government and partner organizations. Further, the sample adoption resolution (Appendix A) includes a resolution item stating the intent of the jurisdiction governing body to incorporate mitigation planning as an integral component of government and partner operations. By doing so, the Planning Partnership anticipates that:

- Hazard mitigation planning will be formally recognized as an integral part of overall planning and emergency management efforts;
- The Hazard Mitigation Plan, Comprehensive Plans, Emergency Management Plans and other relevant planning mechanisms will become mutually supportive documents that work in concert to meet the goals and needs of residents.

During the HMP annual review process, each participating jurisdiction will be asked to document how they are utilizing and incorporating the Sussex County HMP into their day-to-day operations and planning and regulatory processes. Additionally, each jurisdiction will identify additional policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions and include these findings and recommendations in the Annual HMP Progress Report. The following checklist was adapted from FEMA's Local Mitigation Handbook (2013), Appendix A, Worksheet 4.2. This checklist will help a jurisdiction analyze how hazard mitigation is integrated into plans, ordinances, regulations, ordinances, and policies. By completing the checklist, it will help jurisdictions identify areas that integrate hazard mitigation currently and where to make improvements and reduce vulnerability to future development. In this manner, the integration of mitigation into activities will evolve into an ongoing culture within the county and all jurisdictions.

Table 7-2. Safe Growth Checklist

Planning Mechanisms	Do you do this? Yes	Do you do this? No	How is it being done or how will this be utilized in the future?
Operating, Local and Capital Improvement Program Budgets			
• When constructing upcoming budgets, hazard mitigation actions will be funded as budget allows. Construction projects will be evaluated to see if they meet the hazard mitigation goals.			
• Annually, the jurisdiction will review mitigation actions when allocating funding.			
• Do budgets limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?			
• Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?			
• Do budgets provide funding for hazard mitigation projects identified in the County HMP?			
Human Resource Manual			
• Do any job descriptions specifically include identifying and/or implementing mitigation projects/actions or other efforts to reduce natural hazard risk?			
Building and Zoning Ordinances			
• Prior to, zoning changes, or development permitting, the jurisdiction will review the hazard mitigation plan and other hazard analyses to ensure consistent and compatible land use.			
• Does the zoning ordinance discourage development or redevelopment within natural areas including wetlands, floodways, and floodplains?			
• Does it contain natural overlay zones that set conditions?			
• Does the ordinance require developers to take additional actions to mitigate natural hazard risk?			
• Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?			
• Do the ordinances prohibit development within, of filling of, wetlands, floodways, and floodplains?			
Subdivision Regulations			

Planning Mechanisms	Do you do this? Yes	Do you do this? No	How is it being done or how will this be utilized in the future?
• Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?			
• Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?			
• Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?			
• Do the regulations allow density transfers where hazard areas exist?			
Comprehensive Plan			
• Are the goals and policies of the plan related to those of the County HMP?			
• Does the future land use map clearly identify natural hazard areas?			
• Do the land use policies discourage development or redevelopment with natural hazard areas?			
• Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?			
Land Use			
• Does the future land use map clearly identify natural hazard areas?			
• Do the land use policies discourage development or redevelopment with natural hazard areas?			
• Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?			
Transportation Plan			
• Does the transportation plan limit access to hazard areas?			
• Is transportation policy used to guide growth to safe locations?			
• Are transportation systems designed to function under disaster conditions (e.g. evacuation)?			
Environmental Management			
• Are environmental systems that protect development from hazards identified and mapped?			
• Do environmental policies maintain and restore protective ecosystems?			
• Do environmental policies provide incentives to development that is located outside protective ecosystems?			
Grant Applications			

Planning Mechanisms	Do you do this? Yes	No	How is it being done or how will this be utilized in the future?
• Data and maps will be used as supporting documentation in grant applications.			
Ordinances			
• When updating ordinances, hazard mitigation will be a priority			
Economic Development			
• Local economic development group will take into account information regarding identified hazard areas when assisting new businesses in finding a location.			
Public Education and Outreach			
• Does the jurisdiction have any public outreach mechanisms / programs in place to inform citizens on natural hazards, risk, and ways to protect themselves during such events?			

7.1.3 EVALUATING

The evaluation of the mitigation plan is an assessment of whether the planning process and actions have been effective, if the HMP goals are being achieved, and whether changes are needed. The HMP will be evaluated on an annual basis to determine the effectiveness of the programs, and to reflect changes that could affect mitigation priorities or available funding.

The status of the HMP will be discussed and documented at an annual plan review meeting of the Planning Partnership, to be held either in person or via teleconference approximately one year from the date of local adoption of this update, and successively thereafter. At least two weeks before the annual plan review meeting, the Sussex County HMP Coordinator will advise Planning Partnership members of the meeting date, agenda and expectations of the members.

The Sussex County HMP Coordinator will be responsible for calling and coordinating the annual plan review meeting and soliciting input regarding progress toward meeting plan goals and objectives. These evaluations will assess whether:

- Goals and objectives address current and expected conditions.
- The nature or magnitude of the risks has changed.
- Current resources are appropriate for implementing the HMP and if different or additional resources are now available.
- Actions were cost effective.
- Schedules and budgets are feasible.
- Implementation problems, such as technical, political, legal or coordination issues with other agencies are presents.
- Outcomes have occurred as expected.
- Changes in county or community resources impacted plan implementation (e.g., funding, personnel, and equipment)

- New agencies/departments/staff should be included, including other local governments as defined under 44 CFR 201.6. New agencies/departments/staff should be included, including other local governments as defined under 44 CFR 201.6.

Specifically, the Planning Partnership will review the mitigation goals, objectives, and activities using performance-based indicators, including:

- New agencies/departments
- Project completion
- Under/over spending
- Achievement of the goals and objectives
- Resource allocation
- Timeframes
- Budgets
- Lead/support agency commitment
- Resources
- Feasibility

Finally, the Planning Partnership will evaluate how other programs and policies have conflicted or augmented planned or implemented measures, and shall identify policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions ("Implementation of Mitigation Plan through Existing Programs" subsection later in this section discusses this process). Other programs and policies can include those that address:

- Economic development
- Environmental preservation
- Historic preservation
- Redevelopment
- Health and/or safety
- Recreation
- Land use/zoning
- Public education and outreach
- Transportation

The Planning Partnership should refer to the evaluation forms, Worksheets #2 and #4 in the FEMA 386-4 guidance document, to assist in the evaluation process (see Appendix G – Plan Review Tools). Further, the Planning Partnership should refer to any process and plan review deliverables developed by the county or participating jurisdictions as a part of the plan review processes established for prior or existing local HMPs within the county.

The Sussex County HMP Coordinator shall be responsible for preparing an Annual HMP Progress Report for each year of the performance period, based on the information provided by the local Planning Partnership members, information presented at the annual Planning Partnership meeting, and other information as appropriate and relevant. These annual reports will provide data for the five-year update of this HMP and will assist in pinpointing any implementation challenges. By monitoring the implementation of the HMP on an annual basis, the Planning Partnership will be able to assess which projects are completed, which are no longer feasible, and what projects should require additional funding.

The Annual HMP Progress Report shall be posted on the Sussex County HMP website to keep the public apprised of the plan's implementation. Additionally, the website provides details on the HMP update planning process. For communities who might choose to join the NFIP CRS program, this report will also be provided to each CRS participating community in order to meet annual CRS recertification requirements. To meet this recertification timeline, the Planning Partnership will strive to complete the review process and prepare an Annual HMP Progress Report by September 30 of each year. (https://www.sussex.nj.us/cn/webpage.cfm?TPID=11091)

The HMP will also be evaluated and revised following any major disasters, to determine if the recommended actions remain relevant and appropriate. The risk assessment will also be revisited to see if any changes are necessary based on the pattern of disaster damages or if data listed in the Section 4.3 (Hazard Profiles) of this plan has been collected to facilitate the risk assessment. This is an opportunity to increase the jurisdictions disaster resistance and build a better and stronger community.

7.1.4 UPDATING

44 CFR 201.6.d.3 requires that local hazard mitigation plans be reviewed, revised as appropriate, and resubmitted for approval in order to remain eligible for benefits awarded under DMA 2000. It is the intent of the Sussex County HMP Planning Partnership to update this plan on a five-year cycle from the date of initial plan adoption.

To facilitate the update process, the Sussex County HMP Coordinator, with support of the Planning Partnership, shall use the second annual Planning Partnership meeting to develop and commence the implementation of a detailed plan update program. The Sussex County HMP Coordinator shall invite representatives from NYS DHSES to this meeting to provide guidance on plan update procedures. This program shall, at a minimum, establish who shall be responsible for managing and completing the plan update effort, what needs to be included in the updated plan, and a detailed timeline with milestones to assure that the update is completed according to regulatory requirements.

At this meeting, the Planning Partnership shall determine what resources will be needed to complete the update. The Sussex County HMP Coordinator shall be responsible for assuring that needed resources are secured.

Following each five-year update of the mitigation plan, the updated plan will be distributed for public comment. After all comments are addressed, the HMP will be revised and distributed to all planning group members and the New York State Hazard Mitigation Officer.

7.1.5 GRANT MONITORING AND COORDINATION

Sussex County recognizes the importance of having an annual coordination period that helps each planning partner become aware of upcoming mitigation grant opportunities identifies multi-jurisdiction projects to pursue. Grant monitoring will be the responsibility of each planning partner as part of their annual progress reporting. The Sussex County HMP Coordinator will keep the planning partners apprised of Hazard Mitigation Assistance grant openings and assist in developing letters of intent for grant opportunities when practicable.

Sussex County intends to be a resource in the support of project grant writing and development. The degree of this support will depend on the level of assistance requested by the partnership during open windows for grant applications. As part of grant monitoring and coordination, Sussex County intends to provide the following:

- Notification to planning partners about impending grant opportunities.
- A current list of eligible, jurisdiction-specific projects for funding pursuit consideration.

- Notification about mitigation priorities for the fiscal year to assist the planning partners in the selection of appropriate projects.

Grant monitoring and coordination will be integrated into the annual progress report or as needed based on the availability of non-HMA or post-disaster funding opportunities.

7.2 IMPLEMENTATION OF MITIGATION PLAN THROUGH EXISTING PROGRAMS

Effective mitigation is achieved when hazard awareness and risk management approaches and strategies become an integral part of public activities and decision-making. Within the county there are many existing plans and programs that support hazard risk management, and thus it is critical that this hazard mitigation plan integrate and coordinate with, and complement, those existing plans and programs.

The "Capability Assessment" section of Section 6 (Mitigation Strategy) provides a summary and description of the existing plans, programs and regulatory mechanisms at all levels of government (federal, state, county and local) that support hazard mitigation within the county. Within each jurisdictional annex in Section 9 (Jurisdictional Annexes), the County and each participating jurisdiction identified how they have integrated hazard risk management into their existing planning, regulatory and operational/administrative framework ("existing integration"), and how they intend to promote this integration ("opportunities for future integration").

It is the intention of Planning Partnership representatives to incorporate mitigation planning as an integral component of daily government operations. Planning Partnership representatives will work with local government officials to integrate the newly adopted hazard mitigation goals and actions into the general operations of government and partner organizations. Further, the sample adoption resolution (Appendix A) includes a resolution item stating the intent of the local governing body to incorporate mitigation planning as an integral component of government and partner operations. By doing so, the Planning Partnership anticipates that:

1. Hazard mitigation planning will be formally recognized as an integral part of overall emergency management efforts;
2. The Hazard Mitigation Plan, Comprehensive Plans, Emergency Management Plans and other relevant planning mechanisms will become mutually supportive documents that work in concert to meet the goals and needs of county residents.

Other planning processes and programs to be coordinated with the recommendations of the hazard mitigation plan include the following:

- Emergency response plans
- Training and exercise of emergency response plans
- Debris management plans
- Recovery plans
- Capital improvement programs
- Municipal codes
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Community Wildfire Protection Plans
- Comprehensive Flood Hazard Management Plans

- Resiliency plans
- Community Development Block Grant-Disaster Recovery action plans
- Public information/education plans

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation.

During the annual plan evaluation process, the Planning Partnership representatives will identify additional policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions and include these findings and recommendations in the Annual HMP Progress Report.

7.3 CONTINUED PUBLIC INVOLVEMENT

Sussex County and participating jurisdictions are committed to the continued involvement of the public in the hazard mitigation process. This HMP update will continue to be posted on-line (https://www.sussex.nj.us/cn/webpage.cfm?TPID=11091). In addition, public outreach and dissemination of the HMP will include:

- Links to the plan on jurisdiction websites of each jurisdiction with capability.
- Continued utilization of existing social media outlets (Facebook, Twitter) to inform the public of natural hazard events, such as floods and severe storms. Educate the public via the jurisdictional websites on how these applications can be used in an emergency situation.
- Development of annual articles or workshops on flood hazards to educate the public and keep them aware of the dangers of flooding.
- A new interactive website that features the plan, a complete hazard profile, stakeholder surveys, citizen surveys, public commentary and mitigation project submission

Planning Partnership representatives and the Sussex County HMP Coordinator will be responsible for receiving, tracking, and filing public comments regarding this HMP. The public will have an opportunity to comment on the plan via the hazard mitigation website at any time. The HMP Coordinator will maintain this website, posting new information and maintaining an active link to collect public comments. The HMP Coordinator also intends to post the annual plan review report on the website and StoryMap.

The public can also provide input at the annual review meeting for the HMP and during the next five-year plan update. The Sussex County HMP Coordinator is responsible for coordinating the plan evaluation portion of the meeting, soliciting feedback, collecting and reviewing the comments, and ensuring their incorporation in the five-year plan update as appropriate. Additional meetings might also be held as deemed necessary by the planning group. The purpose of these meeting would be to provide the public an opportunity to express concerns, opinions, and ideas about the mitigation plan.

The Planning Partnership representatives shall be responsible to assure that:

- Public comment and input on the plan, and hazard mitigation in general, are recorded and addressed, as appropriate.
- Copies of the latest approved plan (or draft in the case that the five-year update effort is underway) are available for review, along with instructions to facilitate public input and comment on the plan.
- Appropriate links to the Sussex County HMP website are included on jurisdiction websites.

- Public notices are made as appropriate to inform the public of the availability of the plan, particularly during plan update cycles.
- The Sussex County HMP Coordinator shall be responsible to assure that:
- Public and stakeholder comment and input on the plan, and hazard mitigation in general, are recorded and addressed, as appropriate.
- The Sussex County HMP website and StoryMap is maintained and updated as appropriate, including the posting of the annual plan review reports.
- Copies of the latest approved plan are available for review at appropriate county facilities along with instructions to facilitate public input and comment on the plan.

Public notices, including media releases, are made as appropriate to inform the public of the availability of the plan, particularly during plan update cycles.

SECTION 8. PLANNING PARTNERSHIP

2021 HMP Changes

- The 2021 HMP update maintained the two-volume approach with each jurisdiction having an individual annex (Section 9). Enhancements to the annex subsections is described below and in further detail in this section.
  - Reorganization of information
  - Expanded capability assessment to include integration in the tables and a subsection on adaptive capacity
  - A streamlined presentation of the hazard ranking
  - The mitigation of repetitive and severe repetitive flood loss properties is listed
  - Problem statements are summarized in the updated mitigation strategy table
  - A subsection dedicated to staff and local stakeholder involvement in annex development

This section provides a description of the Sussex County's HMP update planning partnership, their responsibilities throughout the planning process, and the jurisdictional annexes developed as a result of their plan update efforts.

8.1 BACKGROUND

The Federal Emergency Management Agency (FEMA) encourages multi-jurisdictional planning for hazard mitigation. All participating jurisdictions must meet the requirements of Chapter 44 of the Code of Federal Regulations (44 CFR):

"Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan" [Section 201.6a(4)]

Members of the Planning Partnership have the expertise to develop the plan and have their jurisdiction's authority to implement the mitigation strategy developed during the planning process. The Planning Partnership is responsible for developing and reviewing draft sections of the plan, updating their respective annex, creating the mitigation strategy for their jurisdiction, and adopting the final plan.

For the Sussex County HMP update, a Planning Partnership was formed to leverage resources and to meet requirements for the federal Disaster Mitigation Action of 2000 (DMA) for as many eligible governments as possible. Members of the Planning Partnership consisted of representatives from each jurisdiction. The DMA defines a local government as follows:

Any county, municipality, city, town, township , public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Each participating planning partner has prepared a jurisdictional annex to this plan. These annexes, as well as information on the process by which they were created, are contained in this volume.

8.2 INITIAL SOLICITATION AND LETTERS OF INTENT

Sussex County solicited the participation of all municipalities in the County at the commencement of this project. All municipalities interested signed a "Letter of Intent to Participate" committing their participation and

resources to the development of the Sussex County HMP update (Appendix B). Sussex County and all municipalities in the County participated in the update process and have met the minimum requirements of participation as established by the County and Steering Committee.

8.3 PLANNING PARTNER EXPECTATIONS

The Steering Committee developed the following list of planning partner expectations, which were outlined in the letter sent by Sussex County DEM to all jurisdictions and confirmed at the kick-off meeting held on August 18, 2020 (see Appendix C [Meeting Documentation] for details):

- Complete administrative tasks:
  - Complete a letter of intent to participate and return to the Sussex County DEM
  - Designate points of contact
- Provide representation at planning partnership meetings;
- Provide information about jurisdictional assets (critical facilities, plans/ordinances, hazard events/damages, new development, etc.) as requested;
- Support public outreach efforts within the jurisdictions, including posting of notices and plan links on websites and local media sources, advertising and supporting public meetings, and supporting outreach to NFIP repetitive loss and severe repetitive loss property owners, where applicable;
- Solicit and encourage the participation of regional agencies, a range of stakeholders, and citizens in the HMP development process;
- Assist with the identification of stakeholders within the jurisdiction that should be informed and potentially involved with the planning process;
- Prepare and submit a jurisdictional annex.
  - Attend mitigation workshop
  - Perform a capability assessment
  - Review the risk assessment
  - Involve local NFIP Floodplain Administrator in the planning process and have them complete the NFIP portion of the annex
  - Review the 2016 mitigation strategies and provide a status of each
  - Identify jurisdiction-specific mitigation strategies to address each of the natural hazards posing a risk to the jurisdiction;
- Review draft plan sections when requested and provide comment and input as appropriate;
- Ensure the HMP update meets the requirements of the DMA 2000, and FEMA and NJOEM guidance;
- Adopt the plan by resolution of local governing body after FEMA conditional approval;
- Provide information regarding progress on identified initiatives as requested by the County Hazard Mitigation Planning Coordinator; and
- Participate, as able, in additional opportunities:
  - Attend municipal support meetings
  - Participate in and advertise the public review and comment period prior to adoption.

By adopting this plan, each planning partner also agrees to the plan implementation and maintenance protocol established in Volume I. As described in Volume I, Section 7 (Plan Maintenance) it is intended that the planning partnership remain active beyond the regulatory update to support plan maintenance. Regarding the composition of the Steering Committee and Planning Partnership, it is recognized that individual commitments change over time, and it shall be the responsibility of each jurisdiction and its representatives to inform the HMP Coordinator of any changes in representation.

8.4 JURISDICTIONAL ANNEX PREPARATION PROCESS

As in the 2016 HMP, the jurisdictional annexes were maintained and updated for the 2021 HMP. The jurisdictional annexes continue to provide a unique, stand-alone guide to mitigation planning for each jurisdiction. Section 9 (Jurisdictional Annexes) includes an annex for every jurisdiction in Sussex County.

Data Collection

Each jurisdiction was paired with a contract consultant mitigation planner to work with the primary POC, alternate POC, NFIP Floodplain Administrator and the mitigation team to update their annexes. Each jurisdiction was asked to participate in a municipal kick-off meeting, held on September 10, 2020 to review participant expectations and the updated information needed to support the annex update. It was made clear that the annexes are sections of the plan that can be enhanced if more information is available to further customize any and all aspects of mitigation planning.

A concerted effort was made to have all plan participants document areas of flooding outside of the floodplain, and other 'problem areas' in the County where hazard impacts have occurred in the past and present chronic issues and challenges. This information was captured using an online form (Survey123) to capture the location on a map and description of the problem area.

Hazard Ranking Exercise

The presentation of the risk assessment and hazard ranking for each jurisdiction was conducted on October 28, 2020. At this meeting, the consultant presented the overall risk assessment for the hazards of concern and distributed jurisdiction-specific handouts with risk assessment results relevant to each plan participant. In addition, each planning partner was asked to review the ranked hazards specific for its jurisdiction. Refer to Section 4.4 (Hazard Ranking) for the methodology of the hazard ranking process. The calculated ranking was presented to each jurisdiction and they were asked to review the ranking and revise based on history of events, probability of occurrence, and the potential impact on people, property, and the economy. In addition, each jurisdiction was asked to rank their adaptive capacity for each hazard. Refer to Appendix B (Participation Documentation) for the input submitted by each municipality. The objectives of this exercise were to familiarize the partnership with how to use the risk assessment as a tool to support other planning and hazard mitigation processes and to help prioritize types of mitigation actions that should be considered. Hazards that were ranked as "high" for each jurisdiction as a result of this exercise were considered to be priorities for identifying appropriate mitigation actions, although jurisdictions also identified actions to mitigate "medium" or "low" ranked hazards as appropriate.

Strengths Weaknesses Obstacles and Opportunities (SWOO) Exercise

The Steering Committee and Planning Partnership were asked to participate in a facilitated SWOO session to identify strengths, weakness or challenges, obstacles and opportunities in hazard mitigation for the County's high-ranked hazards. Then, each jurisdiction was asked to complete a SWOO online form to document strengths, weaknesses, obstacles and opportunities relevant to their jurisdiction for their high-ranked hazards. All SWOO results were compiled and provided as a resource to plan participants at the Mitigation Strategy Workshop in November 2020. Refer to Appendix B (Participation Documentation) which provides the information captured by meeting participants during the SWOO session.

Mitigation Strategy Workshop

A mitigation strategy workshop was conducted by the contracted planning consultant on November 12, 2020, for all participating jurisdictions to support the development of the updated mitigation strategy. To assist with the identification of implementable and action-oriented mitigation actions, a three-step process was followed for

the 2021 HMP update: 1) Assemble a 'mitigation toolbox'; 2) Identify problem statements through 'mitigation brainstorming' and 3) Update the mitigation action plan. The purpose of this workshop was to guide the planning partnership in completing this portion of the planning process and discuss how projects that are well developed and documented are more quickly identifiable for selection when grants become available.

Electronic problem statement worksheets were developed and distributed to all jurisdictions which detailed detail the problems/challenges/gaps/identified to date, and mitigation alternatives to reduce future risk and address the identified problem. At the workshop the problem statements were reviewed, and the Planning Partnership focused on developing additional statements based on the impacts of hazards in the County and their communities. The results of the updated risk assessment, challenges and opportunities identified during the capability assessment update and SWOO sessions, and information gathered from the citizen survey were used to inform problem statement development. At the workshop, the Planning Partnership heard from the County, NJOEM, and the consultant on how to develop a diverse and detailed mitigation strategy and action worksheets.

These problem statements were intended to provide a detailed description of the problem area, including impacts to the jurisdiction, past damages, and loss of service. These problem statements helped form a bridge between the hazard risk assessment, which quantifies impacts to each community, with the development of achievable mitigation strategies. Each jurisdiction was requested to identify their highest priority mitigation strategy for implementation, of funding was available.

Municipal Support Meetings

In addition to the municipal kick-off meeting and Planning Partnership meetings, municipal support meetings were held throughout the planning process. At these support meetings, the consultant worked one-on-one with the planning partners to complete their jurisdictional annexes. Each section of the annex was discussed to ensure accuracy and completeness. This included, but not limited to, the following:

- Reviewing the calculated hazard ranking for the jurisdiction and provide input to adjust the ranking as necessary.
- Inspecting the list of critical facilities located in the jurisdiction and their exposure to the 1% flood hazard area. For those critical facilities located in the Special Flood Hazard Area, each jurisdiction was requested to document whether the asset is already mitigated or identify an action to mitigate future flood impacts. By reviewing the list, jurisdictions were able to identify additional mitigation actions related to the critical facilities.
- Identify mitigation initiatives that have reasonable potential to be accomplished within the lifespan of the County HMP (five years), including both FEMA-eligible projects and those projects using funds from non-FEMA sources.

Jurisdictional Annexes

While the jurisdictional annex format is designed to document and assure local compliance with the DMA 2000 regulations, its greater purpose and function includes:

- Providing a locally relevant synthesis of the overall mitigation plan that can be readily presented, distributed, and maintained;
- Facilitating local understanding of the community's risk to natural hazards;
- Facilitating local understanding of the community's capabilities to manage natural hazard risk, including opportunities to improve those capabilities;
- Facilitating local understanding of the efforts the community has taken, and plans to take, to reduce their natural hazard risk;
- Facilitating the implementation of mitigation strategies, including the development of grant applications;

- Providing a framework by which the community can continue to capture relevant data and information for future plan updates.

It is recognized that each jurisdiction's annex is a "living" document and will continue to be improved as resources permit. As such, its design is intended to promote and accommodate continued efforts to maintain the annex to be current and to improve the effectiveness of the annex as the key tool, reference and guiding document by which the jurisdiction will implement hazard mitigation locally.

The following provides a description of the various elements of the jurisdictional annex.

Section 9.X.1: Hazard Mitigation Planning Team: Identifies the hazard mitigation planning primary and alternate(s) contacts and Floodplain Administrators as identified by the jurisdiction, and additional representatives that contributed to the annex update. Further detail is provided in Section 2 (Planning Process), Section 9 (jurisdictional annexes) and Appendix B (Participation Matrix).

Section 9.X.2: Jurisdiction Profile: Provides an overview and profile of the jurisdiction.

Section 9.X.3: Growth/Development Trends: Identifies of areas of known and anticipated future development and the vulnerability of those areas to the hazards of concern.

Section 9.X.4: Capability Assessment: This subsection provides an inventory and evaluation of the jurisdiction's tools, mechanisms and resources available to support hazard mitigation and natural hazard risk reduction. Within the municipal annexes, tables provide an inventory of the municipality's planning and regulatory, administrative and technical, and fiscal, capabilities, respectively. Further, another table identifies the municipality's level of participation in state and federal programs designed to promote and incentivize local risk reduction efforts. Further information regarding Federal, State and local capabilities may be found in the Capability Assessment portion of Section 5.

- ***Adaptive Capacity:*** *A new addition to the capability assessment is a summary of the jurisdiction's adaptive capacity to each hazard.*

- ***National Flood Insurance Program (NFIP):*** This subsection documents the NFIP as implemented within the jurisdiction. This summary was based on questions prepared by, and/or interviews conducted with, the NFIP Floodplain Administrators for each NFIP-participating community in the County. This subsection also identifies actions to enhance implementation and enforcement of the NFIP within the community.

- ***National Flood Insurance Program (NFIP) Summary:*** Provides NFIP summary statistics for the jurisdiction.

- ***Integration of Hazard Mitigation into Existing and Future Planning Mechanisms:*** This subsection identifies how the jurisdiction has integrated hazard risk management into their existing planning, regulatory and operational/administrative framework ("integration capabilities"), and/or how they intend to promote this integration ("integration actions"). This is included as a new column in the planning/regulatory table and described in narrative at the end of this subsection.

Section 9.X.5: Hazard Event History Specific to the Jurisdiction: Identifies hazard events that have caused significant impacts within the jurisdiction, including a summary characterization of those impacts as identified by the jurisdiction. The documentation of events and losses is critical to supporting the identification and justification of appropriate mitigation actions, including providing critical data for benefit-cost analysis. It is recognized that this "inventory" of events and losses is a work-in-progress, and may continue to be improved as

resources permit. As such, the lack of data or information for a specific event does not necessarily mean that the jurisdiction did not suffer significant losses during that event.

Section 9.X.6: Jurisdiction-Specific Vulnerabilities and Hazard Ranking: This subsection provides information regarding each plan participant's vulnerability to the identified hazards. New to the 2020 HMP is a table summarizing the risk assessment results for the jurisdiction. Full data and information on the hazards of concern, the methodology used to develop the vulnerability assessments, and the results of those assessments that serve as the basis of these local risk rankings may be found in Section 4.

- ***Repetitive Flood Losses:*** A summary of the repetitive and severe repetitive loos properties in the jurisdiction is documented. In addition, the number of properties mitigated has also been documented as recorded by NJOEM.
- ***Critical Facility and Lifeline Flood Risk:*** Identifies potential flood losses to critical facilities in the jurisdiction, based on the flood vulnerability assessment process presented in Section 4 (Risk Assessment). If a mitigation action is identified, this is specified in the table.
- ***Identified Issues:*** Presents other specific hazard vulnerabilities as identified by the jurisdiction.
- ***Hazard Extent and Location:*** Each annex includes a map (or series of maps) illustrating identified hazard zones, critical facilities, and areas of NFIP Repetitive Loss/Severe Repetitive Loss (RL/SRL). Further, these maps show areas of known or anticipated future development, as available and provided by the jurisdiction. These maps may be found at the end of the annex.
- ***Hazard Risk Ranking***: The Sussex County HMP update identifies and characterizes the broad range of hazards that pose risk to the entire planning area; however, each jurisdiction has differing degrees of risk exposure and vulnerability aside from the whole. The local risk ranking serves to identify each jurisdiction's degree of risk to each hazard as it pertains to them, supporting the appropriate selection and prioritization of initiatives that will reduce the highest levels of risk for each community.

Section 9.X.7: Mitigation Strategy and Prioritization: This section discusses and provides the status of past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

- ***Past Mitigation Initiative Status:*** Where applicable, a review of progress on the jurisdiction's prior mitigation strategy is presented, identifying the disposition of each prior action, project or initiative in the jurisdiction's updated mitigation strategy. Other completed or on-going mitigation activities that were not specifically part of a prior local mitigation strategy may be included in this sub-section as well.
- ***Completed Mitigation Initiatives Not Identified in the Previous Mitigation Strategy:*** Other completed or on-going mitigation activities that were not specifically part of a prior local mitigation strategy may be included in this subsection as well.
- ***Proposed Hazard Mitigation Initiatives for the Plan Update:*** Table 9.X-16 presents the jurisdiction's updated mitigation strategy. Table 9.X-17 provides a summary of the local mitigation strategy prioritization process discussed in Section 6 (Mitigation Strategy). Table 9.X-18 summarizes the mitigation action types identified by hazard in the jurisdiction.

Hazard Area Extent and Location Maps: Each annex includes a series of maps illustrating identified hazard zones and critical facilities. Further, these maps show areas of known or anticipated future development, as available and provided by the jurisdiction.

Action Worksheets: FEMA-eligible mitigation actions, projects and initiatives are further documented on an Action Worksheet which provides details on the project identification, evaluation, prioritization and implementation process.

Annex Review

Additional meetings to complete the jurisdictional annexes were held with the Steering and Planning Committees throughout the planning process. In preparation for the draft plan public review, each jurisdiction was asked to have their 'mitigation team' review their annex to ensure it was complete and accurate for posting to the Sussex County DEM's mitigation website.

In summary, all participating communities and the County completed the planning partner expectations and annex-preparation process. Details regarding these meetings are described further in Sections 2 (Planning Process) and 6 (Mitigation Strategy). Completed jurisdictional annexes are presented in Section 9.

8.5 COVERAGE UNDER THE PLAN

All jurisdictions (County and municipalities) met the participation requirements specified by the Steering Committee. Any non-participating local jurisdiction within the Sussex County planning area can "link" to this plan in the future following the linkage procedures defined in Appendix H (Linkage Procedures).

Table 8-1 lists the status of each jurisdiction, whether or not they submitted letters of intent to participate, and their ultimate status in this plan update. Refer to Appendix B (Participation Documentation) and Appendix C (Meeting Documentation) for details on participation and meeting attendance.

Table 8-1. Jurisdictional Status

Jurisdiction	Letter of Intent to Participate	Attended Workshops and/or Meetings and Project Calls	Provided Update on Past Projects	Submitted Mitigation Actions for Current Plan	Seeking Approval for Adoption (meets all previous requirements)
Sussex County	NA	X	X	X	Yes
Andover (B)	X	X	X	X	Yes
Andover (Twp)	X	X	X	X	Yes
Branchville (B)	X	X	X	X	Yes
Byram (Twp)	X	X	X	X	Yes
Frankford (Twp)	X	X	X	X	Yes
Franklin (B)	X	X	X	X	Yes
Fredon (Twp)	X	X	X	X	Yes
Green (Twp)	X	X	X	X	Yes
Hamburg (B)	X	X	X	X	Yes
Hampton (Twp)	X	X	X	X	Yes
Hardyston (Twp)	X	X	X	X	Yes
Hopatcong (B)	X	X	X	X	Yes
Lafayette (Twp)	X	X	X	X	Yes
Montague (Twp)	X	X	X	X	Yes
Newton (T)	X	X	X	X	Yes
Ogdensburg (B)	X	X	X	X	Yes
Sandyston (Twp)	X	X	X	X	Yes
Sparta (Twp)	X	X	X	X	Yes
Stanhope (B)	X	X	X	X	Yes

Jurisdiction	Letter of Intent to Participate	Attended Workshops and/or Meetings and Project Calls	Provided Update on Past Projects	Submitted Mitigation Actions for Current Plan	Seeking Approval for Adoption (meets all previous requirements)
Stillwater (Twp)	X	X	X	X	Yes
Sussex (B)	X	X	X	X	Yes
Vernon (Twp)	X	X	X	X	Yes
Walpack (Twp)	X	X	X	X	Yes
Wantage (Twp)	X	X	X	X	Yes

NA = Not applicable. The Sussex County's DEM is the HMP Coordinator and managed the project and grant and served as Steering Committee chair. A letter of intent to participate was not required for Sussex County.

Workshops and additional meetings (via in person, email and/or teleconference) to complete the jurisdictional annexes were held with the Steering and Planning Committees throughout the planning process. In summary, all participating communities and the County completed the planning partner expectations and annex-preparation process. Details regarding these meetings are described further in Section 2 (Planning Process) and Section 6 (Mitigation Strategy). Completed jurisdictional annexes are presented in Section 9.

SECTION 9. JURISDICTIONAL ANNEXES

Section 201.6.a(4) of Chapter 44 of the Code of Federal Regulations (44CFR) states: "Multi-jurisdictional plans (e.g. watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan." One component of each participating jurisdiction's involvement in the planning process of this HMP was to prepare an annex that focuses specifically on the natural hazards facing their community and the mitigation actions they propose to reduce their exposure and losses to these hazards.

Sussex County and each participating jurisdiction completed an annex that outlines the following information: natural hazard event history, hazard ranking and vulnerability, capabilities, progress on past mitigation actions and an updated mitigation strategy specific to the County or that jurisdiction. Once complete, the County and each participating jurisdiction reviewed and approved their final annex prior to submission to the NJOEM and the FEMA Region 2. Each jurisdiction's annex itself may be found in Sections 9.1 through 9.25.

9.1 SUSSEX COUNTY

This section presents the jurisdictional annex for the Sussex County. The annex includes a general overview of the Sussex County; an assessment of the Sussex County's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.1.1 Hazard Mitigation Planning Team

Sussex County followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.1-1. Hazard Mitigation Planning Team

Primary Point of Contact		Alternate Point of Contact
Name / Title: Bob Haffner, Director/Division of Emergency Management Address: 135 Morris Turnpike, Newton, New Jersey 07860 Phone Number: (973) 579-0380 x2208 Email: rhaffner@sussexcountysheriff.com		Name / Title: Jennifer Van Der Wende, Corporal/Division of Emergency Management Address: 135 Morris Turnpike, Newton, New Jersey 07860 Phone Number: (973) 579-0380 x2366 Email: jenvanderwende@sussexcountysheriff.com
Name	**Title**	**Method of Participation**
Bob Haffner	Division of Emergency Management	Primary point of contact, provided information and data, contributed to mitigation strategy, attended Steering Committee and Planning Partnership meetings
Jennifer Van Der Wende, Division of Emergency Management	Division of Emergency Management	Alternate point of contact, provided information and data, contributed to mitigation strategy, attended Steering Committee and Planning Partnership meetings
Scott House	County DPW	Provided data and information, contributed to mitigation strategy
Autumn Sylvester	Sussex County Division of Planning and Economic Development	Provided data and information, contributed to mitigation strategy, attended Steering Committee and Planning Partnership meetings
William J. Koppenaal	Sussex County Engineering Department	Provided data and information, contributed to mitigation strategy, attended Steering Committee and Planning Partnership meetings
Tom Drabic	Sussex County Division of Planning	Provided data and information, contributed to mitigation strategy, attended Steering Committee and Planning Partnership meetings
Keith Nelson	Sussex County Facilities	Provided data and information, contributed to mitigation strategy, attended Steering Committee and Planning Partnership meetings

9.1.2 Jurisdiction Profile

Please refer to Section 4, Volume I of this HMP for details on Sussex County's population, location, climate, history, growth and development.

9.1.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.1-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development.

Table 9.1-2. Recent and Expected Future Development

Type of Development	2015	2016	2017	2018	2019
Number of Building Permits for New Construction Issued Since the Previous HMP					
Building permits are addressed at the local municipal level.					
Property or Development Name	**Type of Development**	**# of Units / Structures**	**Location** (address and/or block and lot)	**Known Hazard Zone(s)***	**Description / Status of Development**
Recent Major Development and Infrastructure from 2015 to Present					
None identified					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Dennis Library	Renovation and addition	1	101 Main St, Newton, NJ 07860	None identified	Planned. Renovation and addition of existing structure

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.1.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Sussex County performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Sussex County identified specific integration

activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Sussex County and where hazard mitigation has been integrated.

Table 9.1-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *Addressed at the local level.*					
Zoning Code	Yes	State & Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *Addressed at the local level.*					
Subdivisions	Yes	County & Local	Yes – if municipality has a Planning Board	Yes	2021-Sussex County-009
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *Land Development Standards, 2008. Administered by the Planning Board. The Land Development Standards are anticipated to be updated. The update could include information on green technologies and BMPs for addressing stormwater.*					
Stormwater Management	Yes	State & Local	Yes	Yes	2021-Sussex County-009
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *Land Development Standards, 2008. Administered by the Planning Board. The Land Development Standards are anticipated to be updated. The update could include information on green technologies and BMPs for addressing stormwater.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
Comment: • *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	County & Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *Site Plan Review is the responsibility of the Division of Planning & Municipal ordinances*					
Environmental Protection	No	-	No	-	-
Comment:					
Flood Damage Prevention	Yes	State & Local	Yes	Yes	-
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *Adopted at the local level*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	No	-	No	-	-
Comment:					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Other	No	-	No	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	State, County, & Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen commissioners with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *Master Plan Study Report, 2005 Strategic Growth Plan, updated in draft form 2014 (but not adopted). The Plan is the responsibility of the Division of Planning.* • *2016 Open Space Plan. The Plan is the responsibility of the Division of Planning – Open Space Committee. The 2016 update to the Sussex County Open Space Plan acknowledges that the long-term sustainability of the County's groundwater supply depends on safeguarding water quality and quantity. The Plan gives the County the ability to analyze priority lands for preservation and stewardship with a primary focus on properties that support the water resources integral to the county.*					
Capital Improvement Plan	Yes	County	No	Yes	-
Comment: • Annual Capital Project Requests (Both in Summary and Detailed Forms)					
Disaster Debris Management Plan	Yes	County	No	Yes	-
Comment: • The Plan identifies two county locations for debris collection.					
Floodplain or Watershed Plan	Yes	County	No	Yes	-
Comment: • Groundwater Manual. The Manual is the responsibility of the Division of Planning.					
Stormwater Management Plan	No	State & Local	Yes	-	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.*					
Stormwater Pollution Prevention Plan	Yes	County, Local	Yes	Yes	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatable control; locating discharge points and stenciling catch basins; and a public education component. • *The County Stormwater Pollution Prevention Plan*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	Yes	County	No	Yes	-
Comment: • ***Covered under Open Space Plan***					
Economic Development Plan	Yes	County	No	No	-
Comment: • Target Business and Industry Analysis (2009) is the responsibility of the Division of Planning, Vision 2020 Economic Strategy Committee. • Sussex County Economic Base Assessment and Strategic Growth Plan Update (2014) is the responsibility of the Division of Planning, Vision 2020 Economic Strategy Committee.					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	Yes	County, Local	No	Yes	2021-Sussex County-010
Comment: • Ten-Year Mobility Study (2005), Division of Planning • Master Circulation Plan for Transportation (draft, 2016), Division of Planning. The Master Circulation Plan for Transportation is due for an update in the next several years.					
Agriculture Plan	Yes	Local	No	Yes	2021-Sussex County-008
Comment: • *Sussex County Farmland Preservation Plan, last updated in 2008. Update currently underway. Division of Planning – Sussex County Agriculture Development Board* • *The plan is in need of update.*					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	Yes	County	No	Yes	2021-Sussex County-008
Comment: • Sussex County Farmland Preservation Plan includes section on agritourism. • Open Space Plan includes trails section.					
Business Development Plan	No	-	No	-	-
Comment:					
Other	Yes	County	No	Yes	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• Open Space and Recreation Plan, 2003. The Plan is the responsibility of the Division of Planning – Open Space Committee. • Natural Resources Inventory, n.d., Division of Planning • Solid Waste Management Plan, 2013, Division of Planning					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	County	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *Emergency Operations Plan responsibility of the Office of Emergency Management. Last updated 12/11/2019. Expires 12/11/2023*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	County	No	Yes	-
Comment: *Plan in place through OHS&P*					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	Yes	County	No	Yes	-
Comment:					
Public Health Plan	Yes	County	No	Yes	-
Comment:					
Other	Yes	County	No	Yes	-
Comment: • *County works with local municipalities and provide input on local dam plans* • *Traffic Diversion Plans* • *Communication Plan identifies how communication should flow throughout an incident, who is involved, etc.*					

Table 9.1-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Development permits are issued at the local municipal level.
Does your jurisdiction have the ability to track permits by hazard area?	Development permits are issued at the local municipal level.
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes, but in need of update. Was last updated 10 years ago.

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Sussex County.

Table 9.1-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board, Board of Commissioners
Mitigation Planning Committee	Yes	Sussex County Pre-Disaster Mitigation Steering Committee (alternately, Working Group)

Staff/Personnel Resource	Available?	Department/Agency/Position
Environmental Board / Commission	Yes	Water Quality Policy Advisory Committee, Solid Waste Advisory Committee, Department of Environmental and Health Services
Open Space Board / Committee	Yes	Open Space Committee
Economic Development Commission / Committee	No	Sussex County Economic Development Partnership (SCEDP)
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	SwiftReach 911
Maintenance program to reduce risk	Yes	Sussex County DPW installs snow fencing; annually cleans storm drains and inspects storm drains pre- and post-storm events
Mutual aid agreements	Yes	Intra-County Agreements County Fire Box Alarms Norwest Region (Hunterdon, Somerset, Sussex, Warren) Statewide HazMat County to municipality agreements (MOUs)
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Planning Division, Engineering
Engineers or professionals trained in building or infrastructure construction practices	Yes	Division of Public Works—Office of Roads, Engineering
Planners or engineers with an understanding of natural hazards	Yes	Department of Engineering and Planning
Staff with training in benefit/cost analysis	Yes	Sussex County Department of Finance
Staff with training in green infrastructure	No	-
Staff with education/knowledge/training in low impact development	Yes	Department of Engineering and Planning – Division of Engineering
Surveyor	Yes	Department of Engineering and Planning – Division of Engineering
Stormwater engineer	Yes	Planning and Engineering
Personnel skilled or trained in GIS applications	Yes	Office of GIS Management
Local or state water quality professional	Yes	Director of Division Planning and Economic Development
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Sherriff's Office—Office of Emergency Management
Watershed planner	No	-
Environmental specialist	No	Use outside consultant where necessary
Grant writers	Yes	Planning Division
Resilience Officer	No	-
Other	No	-

Fiscal Capability

The table below summarizes financial resources available to the Sussex County.

Table 9.1-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes

Financial Resource	Accessible or Eligible to Use?
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Sussex County.

Table 9.1-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	County Administrator is PIO. OEM has an incident management team and there is a PIO for the Sheriff's Office
Do you have personnel skilled or trained in website development?	Yes, and outside web master can be utilized for major changes as well.
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes, the County of Sussex webpage posts Pre-Disaster Mitigation Information as well as the current and prior HMP and contact information
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	Yes, Facebook
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	CERT teams discuss preparedness

Community Classifications

The table below summarizes the classifications for community programs available to the Sussex County.

Table 9.1-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	N/A	-	-
Public Protection (Fire ISO Protection Class)	N/A	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words,

it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.1-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

The County has access to resources to determine the possible impacts of climate change through NOAA and NJ DEP and staff keep up on academic updates. The 2016 update to the Sussex County Open Space Plan acknowledges that the long-term sustainability of the County's groundwater supply depends on safeguarding water quality and quantity. The Plan gives the County the ability to analyze priority lands for preservation and stewardship with a primary focus on properties that support the water resources integral to the county.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.1-10. National Flood Insurance Program Compliance

Criterion	Response
Floodplain administration is administered at the local municipal level in the County.	
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	271 policies
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	167 claims $1,729,080

**According to FEMA statistics as of October 13, 2020*
Source: FEMA 2020

Additional Areas of Existing Integration

- **Board of Chosen Commissioners:** The Board of Chosen Commissioners serves as the top governing body in Sussex County. They approve major initiatives, capital improvement spending, and other high level decisions for the County. Additionally, the Board sets policies for five major departments in the county—Department of Central and Shared Services, Department of Engineering and Planning, Department of Environmental and Public Health Services, Department of Finance and Library Services, and Department of Human Services—as well as the 12 Divisions and other boards, commissions, authorities, and committees in the county. The Commissioners are supported in their duties by the County Administrator. The Board of Chosen Commissioners reviews information from county Engineering, DPW, and Planning Division to determine project priorities and release capital improvement funding. These projects include addressing roads that experience frequent flooding (i.e., roadway design and drainage improvements) or are otherwise vulnerable to disasters and hazards.
- **Radiological Program:** Sussex County participates in New Jersey's Radiological Program, per NJOEM's Radiological Program Guidelines, and shared appropriate informational pamphlets with residents on the Sherriff's Office website. Sussex County OEM is privy to hazardous materials (HazMat) and capabilities for response if needed.
- **Stormwater Clearing:** Per NJDEP requirements, the County DPW cleans catch basins each year and cleans in-let and outlets as needed or requested. If fall rains are forecasted, DPW makes sure the catch basins are clear and open; the county also marks the catch basins in the fall to identify their locations for the winter months. These activities are coordinated between DPW and Engineering on a daily basis, facilitated by both departments having the same administrator.
- **Hazardous Materials:** The County Right to Know Coordinator maintains effective coordination and information sharing related to hazardous material sites with NJOEM and the Right to Know Network. The Sussex County HAZMAT team integrates data about hazardous materials with most current available information about other risk factors, e.g. population, climate, other site-specific characteristics.
- **Outside Partnerships and Stakeholders:** The Department of Engineering and Planning, and other relevant departments maintain relationships with the U.S. Army Corps of Engineers (USACE) and Rutgers University, along with other important regional stakeholders. These relationships help provide the county with technical information and/or assistance in the identification of hazard areas and risk assessments.
- **Floodplain Management:** Sussex County DEM and the Planning Division encourage compliance with floodplain management as it relates to new and existing construction by integrating hazard mitigation practices with zoning, subdivision ordinances, comprehensive planning, and other land use tools at the municipal level.
- **Office of GIS Management:** Sussex County maintains an Office of GIS Management, which provides multiple helpful links to residents, including the map applications for bridge and road closures, government services, and West Nile Virus surveillance. It also has prebuilt maps on property parcels, polling locations, watershed boundary (HUC 11), active storm paths, bedrock geology, wetlands, aerial photography, floodplains, and sewer service areas.
- **Operating Budget:** The County's operating budget contains provisions for necessary capital and infrastructure projects, as well as public safety and mitigation initiatives. In the 2015 budget, Sussex County identified $315,116 to be allocated to emergency management (about $8,000 more than was allocated in the 2014 budget). Sussex County also funds other departments involved in mitigation, such as public health, planning, and public works.
- **Outside Funding:** While much of the County's revenue comes from taxes and other fees, part of its revenue is grant-related or received through State Aid. This includes funding from the State Homeland

Security Grant Program, Emergency Management Agency Assistance, funding from the NJ Department of Law and Public Safety for the HMP Update, and other relevant programs. Sussex County also participates in regional or multi-county grant funding opportunities, as needs dictate and opportunities arise.

- **Capital Projects:** The County Capital Budget Request is the vehicle that county departments use to undertake various projects, including mitigation, stormwater management, and drainage enhancements. The 2015 Sussex County budget provides detailed and summary versions of its Capital Budget Request; the detailed version groups projects by relevant departments and categories. Projects of interest include road and bridge enhancements, stormwater improvements, fire security systems upgrades, and security upgrades.
- **Alert Programs:** The Sussex County DEM also oversees two community alert programs—Swift911 and Register Ready. Swift 911 enables the County to provide residents with critical information during hazard events. Residents can select to be notified by phone, e-mail, text message, hearing impaired devices, and more. Register Ready is a statewide program to ensure individuals with disabilities or who may need extra assistance can receive help or advance notification of an impending hazard event.

OPPORTUNITIES FOR FUTURE INTEGRATION

- **FEMA HMA Informational Workshops:** The County will expand offerings and incorporate information on BRIC at an annual workshop related to the FEMA HMA grant programs (HMGP, BRIC, FMA). This may be done at quarterly OEM coordinator meetings and invite other County departments (2021-Sussex County-005).
- **Update Farmland Preservation Plan:** The County will update the Farmland Preservation Plan and include resiliency planning to address long term risk (2021-Sussex County-008).
- **Update Land Development Standards:** The County will update the Land Development Standards. The update will include discussion on green technologies and BMP's for stormwater (2021-Sussex County-009).
- **Master Circulation Plan for Transportation Update:** The County will update the Master Circulation Plan for Transportation, using information from the Hazard Mitigation Plan to identify and reduce risk to the transportation system and maintain emergency access (2021-Sussex County-010).
- **Adopt the Wastewater Management Plan:** The County's Wastewater Management Plan is currently in draft form. Prior to adoption, the County will use information from the Hazard Mitigation Plan to make updates to reduce risk to the wastewater management system (2021-Sussex County-011).

9.1.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Sussex County's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.1-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.1-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Utility issues, road closures
March 3-4, 2019	Snowstorm	No	Up to 8 inches of snow fell in portions of the County. Some areas also experienced freezing rain.	March 2019 snowstorm. Utility issues, road closures, downed trees.
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	Education, procurement of PPE, setting up testing sites, tracking
August 4, 2020	Tropical Storm Isaias (declaration number pending)	Yes	Tropical Storm Isaias brought heavy rain to western New Jersey. Rainfall totals were as high as 3 to 5.5 inches. Observations from surrounding areas suggest sustained tropical storm force winds likely occurred.	Reached damage threshold and applying for a declaration. Downed trees, power outages, road closures.

Source: FEMA 2020, NOAA NCEI 2020

9.1.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Sussex County risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Sussex County that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Sussex County has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Sussex County.

- Number of repetitive loss (RL) properties: 16
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019. Data is as of September 30, 2019.
Note: The number of SRL properties excludes RL properties.

Critical Facilities

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.1-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
Critical facilities within the County are identified in the local municipal annexes in Section 9 and discussed in the County Profile (Section 3).			

Source: Sussex County Planning Partnership 2020
Note:
**Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- Additional sheltering locations are needed to meet the County's sheltering needs.
- Warming centers need to be established in new locations to expand offerings of warming and cooling centers and maintain access for at risk communities.
- DPW is responsible for much work in County areas to conduct tree trimming and emergency tree removal. The DPW lacks a 70-foot tree truck and a stump grinder.
- The Department of Public Works building does not have a roof that meets current standards for snow load. Failure of the roof could lead to a reduction in critical services by DPW before, during, and after hazard events.
- With the advent of new information on how to apply for hazard mitigation funding support and new programs for funding support, additional education is needed for County staff and municipal staff on FEMA HMA grant programs.
- Wildfire preparedness by the public is lacking.
- Frequent flooding events have resulted in damages to residential properties. These properties have been repetitively flooded as documented by paid NFIP claims. The County has 16 repetitive loss properties, but other properties may be impacted by flooding as well.
- The Farmland Preservation Plan was last updated in 2008. A new update is needed which would incorporate more information on hazard mitigation.
- The County's Land Development Standards have not been updated since 2008.
- The Master Circulation Plan for Transportation requires update.
- The County Wastewater Management Plan is currently in draft form and requires adoption.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Sussex County ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Sussex County.

The Sussex County has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Sussex County indicated the following reasons why hazard rankings have changed since the 2016 HMP:

- The County agreed with the calculated hazard rankings.

Table 9.1-13. Sussex County Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	Medium

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
High	High	High	High	High	High	Medium

9.1.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.1-15 and Table 9.1-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.1-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Sussex County-1 (new)	Ensure continuity of operations at critical facilities and county-owned buildings. The following project was identified at this time: Secure a generator for the Sheriff's Office.	Sheriff's Office, SCDEM	Complete		
Sussex County-2 (revised old 4.B.2)	Incorporate hazard mitigation considerations and priorities into various County Plan updates, and integrate the County Master Plan with the County HMP during the Master Plan Update.	SCDEM, Planning Division	Ongoing Capability		
Sussex County-3 (new)	Design and implement a mitigation awareness campaign through County Planning or Rutgers Extension to Farms/Tree Farms regarding	SCDEM, Planning Division, Rutgers Extension	Ongoing Capability		

2016 Action Number Action Description		Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
	the ingestion pathway response for the radiological hazard.				
Sussex County-4 (revised old 1.A.2)	Coordinate with the Sussex County College FM Radio Station to disseminate preparedness information.	SCDEM, Sussex County College	Ongoing Capability		
Sussex County-5 (new)	Increase County capabilities to address tree and roadway maintenance, response and removal, and continuity of operations and purchase a new tree truck (70-feet, chipper box), updated stump grinder, and excavator.	DPW	In Progress: Added fourth person to tree crew. Purchased new 65 feet tree truck and excavator. DPW still needs a 70 foot tree truck and a stump grinder.	X	2021-Sussex County-003
Sussex County-6 (new)	Support continuity of operations at County buildings including the purchase and installation of generators including the Office of Bridges and Traffic, replace a generator at the Andover Garage/OEM warehouse, new generators new warming locations (libraries), shelters (Vo Tech)	Facilities Department	In Progress. Warming stations need to be updated to new locations. Additional shelters still needed. Andover Garage is complete. Office of Emergency Management near completion.	X	2021-Sussex County-001, 2021-Sussex County-002, 2021-Sussex County-016
Sussex County-7 (old County Facilities 1)	Retrofit roof to meet current standards for snow load on County Department of Public Works building located on Route 206.	Facilities Department	No Progress	X	2021-Sussex County-004
Sussex County-8 (revised old 1.A.3, 2.A.4)	Conduct annual workshop related to the FEMA HMA grant programs (HMGP, PDM, FMA). This may be done at quarterly OEM coordinator meetings and invite other County departments.	SCDEM and Engineering	In Progress. The County would like to expand offerings and incorporate information on BRIC.	X	2021-Sussex County-005
Sussex County-9 (revised old 1.A.4)	Coordinate a yearly program for public information on wildfire with NJ Forest Fire Service (Division A Liaison); and post this information on the County website regarding the wildfire hazard (including current information about fuel loads and conditions that may affect potential for fires).	SCDEM	In Progress	X	2021-Sussex County-006
Sussex County-10	Inventory the critical facilities to identify those in geographic areas that may be prone to high	Facilities Department and Engineering	No Progress	X	2021-Sussex County-017

2016 Action Number Action Description		Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
(revised old 2.A.5)	ground motion during earthquakes (due to proximity to faults or to soil characteristics), and those with structures that may be at risk during an earthquake. Study will include determine soil and shake characteristics.				
Sussex County-11 (revised old 2.A.7)	Work to determine soil and shake characteristics at specific sites that the county has identified as priority critical facilities with potential vulnerabilities to earthquake forces. Based on these results, analyze the critical structures to determine if the structures are sound and next steps to further mitigate.	Facilities Department and Engineering	No Progress	X	2021-Sussex County-017
Sussex County-12 (revised old 2.A.9, 2. A. 10)	Identify wind vulnerabilities at County critical facilities because buildings were designed to 70 mph; new updated code is 90 mph.	County Facilities	No Progress	X	2021-Sussex County-017
Sussex County-13 (revised old 2.A.19)	Undertake a survey of critical facilities to identify and prioritize those that may have structural characteristics that make them vulnerable to excessive snow and ice loads such as the Sherriff's Office.	County Facilities	No Progress	X	2021-Sussex County-017
Sussex County-14 (old 2.B.1)	Participate in the Emergency Preparedness Conference and workshops	SCDEM and municipal OEMs, NJOEM, NJFFS	Ongoing capability		
Sussex County-15 (revised 3.A.1)	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect them from future damage; repetitive loss and severe repetitive loss properties should be a priority, when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option Phase 2: Work with the property owners to implement selected action based on	SCDEM	In Progress	X	2021-Sussex County-007

2016 Action Number Action Description		Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
	available funding from FEMA and local match availability.				

In addition to the above progress, the Sussex County identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- The County has done extensive work to increase the outreach and emergency response capabilities regarding the coronavirus pandemic.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Sussex County participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Sussex County participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.1-15 summarizes the comprehensive-range of specific mitigation initiatives the Sussex County would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.1-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.1-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Sussex County-001	Sheltering	**Problem**: Additional sheltering locations are needed to meet the County's sheltering needs. **Solution:** The County will be working to establish new shelters at the Sussex County Fair Grounds (capacity of 200) and the Fredon Civic Center (capacity of 90). Shelters will be designed to meet FEMA standards and include backup power.	New	All Hazards	1, 3, 6	SCDEM	HMGP, BRIC, USDA Community Facilities Grant Program, County budget	Increased sheltering capacity	High	5 years	High	SIP	ES
2021-Sussex County-002	Warming and Cooling Centers	**Problem**: Warming centers need to be established in new locations to expand offerings of warming and cooling centers and maintain access for at risk communities. **Solution:** The County will expand the number of warming and cooling centers to service the County population.	New	Severe Weather, Severe Winter Weather	1, 3, 6	SCDEM	HMGP, BRIC, USDA Community Facilities Grant Program, County budget	Increased emergency capabilities for extreme heat and cold events	Medium	3 years	High	SIP	ES
2021-Sussex County-003	Increase Vegetation Management Capabilities	**Problem**: DPW is responsible for much work in County areas to conduct tree trimming and emergency tree removal. The DPW lacks a 70-foot tree truck and a stump grinder. **Solution:** The County will purchase a 70-foot tree truck and a stump grinder.	N/A	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter	2, 5	DPW	County budget	Increased capabilities	High	5 years	High	SIP	ES
2021-Sussex County-004	DPW Snow Load Retrofit	**Problem:** The Department of Public Works building does not have a roof that meets current standards for snow load. Failure of the roof could lead to a reduction in critical services by DPW before, during, and after hazard events. **Solution:** The County Facilities Department will retrofit the roof to meet current standards for snow load on the County Department of Public Works building located on Route 206.	Existing	Severe Winter Weather, Nor'Easter	1, 2, 6	Facilities	HMGP, BRIC, USDA Community Facilities Grant Program, County budget	Reduction in risk of roof failure and protection of critical services	Medium	5 years	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Sussex County-005	FEMA HMA Informational Workshops	**Problem**: With the advent of new information on how to apply for hazard mitigation funding support and new programs for funding support, additional education is needed for County staff and municipal staff on FEMA HMA grant programs. **Solution:** The County will expand offerings and incorporate information on BRIC at an annual workshop related to the FEMA HMA grant programs (HMGP, BRIC, FMA). This may be done at quarterly OEM coordinator meetings and invite other County departments.	New and Existing	All Hazards	3, 5	SCDEM, Engineering	County budget	Increased participation and success in FEMA HMA programs	Low	1 year	High	EAP	PI
2021-Sussex County-006	Wildfire Outreach	**Problem**: Wildfire preparedness by the public is lacking. **Solution:** Coordinate a yearly program for public information on wildfire with NJ Forest Fire Service (Division A Liaison); and post this information on the County website regarding the wildfire hazard (including current information about fuel loads and conditions that may affect potential for fires).	New and Existing	Wildfire	3, 4	SCDEM	County budget, NJ Forest Fire Service	Increased wildfire awareness and preparedness	Low	2 years	High	EAP	PI
2021-Sussex County-007	Repetitive Loss Mitigation Support	**Problem**: Frequent flooding events have resulted in damages to residential properties. These properties have been repetitively flooded as documented by paid NFIP claims. The County has 16 repetitive loss properties but other properties may be impacted by flooding as well. **Solution:** Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect them from future damage; repetitive loss and severe repetitive loss properties should be a priority, when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option	Existing	Flood, Severe Weather	2	SCDEM, local NFIP Floodplain Administrator, supported by homeowners	FEMA HMGP and FMA, local cost share by residents	Eliminates flood damage to homes and residents, creates open space, increasing flood storage.	$2 Million	3 years	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		Phase 2: Work with the property owners to implement selected action based on available funding from FEMA and local match availability.											
2021-Sussex County-008	Update Farmland Preservation Plan	**Problem**: The Farmland Preservation Plan was last updated in 2008. A new update is needed which would incorporate more information on hazard mitigation. **Solution:** The County will update the Farmland Preservation Plan and include resiliency planning to address long term risk.	New and Existing	All Hazards	4, 5	Department of Engineering and Planning	County budget	Increased planning and preparedness	Low	Within 5 years	High	LPR	PR
2021-Sussex County-009	Update Land Development Standards	**Problem**: The County's Land Development Standards have not been updated since 2008. **Solution:** The County will update the Land Development Standards. The update will include discussion on green technologies and BMP's for stormwater.	New and Existing	All Hazards	2, 4, 5	Department of Engineering and Planning, Planning Board	County budget	Reduced risk to new development and increasing stormwater effectiveness	Low	Within 5 years	High	LPR	PR, SP
2021-Sussex County-010	Master Circulation Plan for Transportation Update	**Problem**: The Master Circulation Plan for Transportation is due for update. **Solution:** The County will update the Master Circulation Plan for Transportation, using information from the Hazard Mitigation Plan to identify and reduce risk to the transportation system and maintain emergency access.	New and Existing	All Hazards	1, 2, 4, 5	Department of Engineering and Planning	County budget	Increased planning	Low	Within 5 years	High	LPR	PP, PR, ES
2021-Sussex County-011	Adopt the Wastewater Management Plan	**Problem**: The County Wastewater Management Plan is currently in draft form and requires adoption. **Solution:** The County's Wastewater Management Plan is currently in draft form. Prior to adoption, the County will use information from the Hazard Mitigation Plan to make updates to reduce risk to the wastewater management system.	New and Existing	Severe Weather, Flood, Hurricane, Nor'Easter.	2, 6	Department of Engineering and Planning	County budget	Reduction in risk of spills, better preparedness	Low	Within 5 years	High	LPR	PR, PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Sussex County-012	Update Stormwater Pollution Prevention Plan	**Problem:** The County's Stormwater Pollution Prevention Plan requires update. **Solution:** The County will update the Stormwater Pollution Prevention Plan, using information from the Hazard Mitigation Plan to assist in the update regarding storms and stormwater.	New and Existing	Flood, Severe Weather	2, 4, 5	Department of Engineering and Planning	County budget	Updated plan with integrated information	Low	1 year	High	LPR	PR
2021-Sussex County-013	PPE for Disease Outbreak Events	**Problem:** During the current COVID-19 pandemic, an adequate supply of personal protective equipment (PPE) for County staff was difficult to come by. Without proper PPE, it puts staff and emergency responders at risk to the spread of infectious diseases. **Solution:** The County will purchase PPE to create a stockpile for municipal staff. This will include gloves, masks, gowns, antibacterial handwash, antiviral cleaning solutions, sanitizers, and misters.	N/A	Disease Outbreak	1, 3, 5	Department of Health and Human Services	BRIC, County budget	Increase protection from diseases; decrease risk of disease spread	High	1 year	High	LPR	ES
2021-Sussex County-014	Disinfecting Equipment for County Facilities	**Problem:** In order to keep County facilities open and functioning during disease outbreak events, the County will require emerging technologies for the disinfecting of County facilities **Solution:** The County Division of Facilities staff will continue to research emerging technologies for the disinfecting of buildings that would allow for continuing operations during disease outbreak events. The Facilities Department will deploy / install technologies that are determined to be cost-effective	Existing	Disease Outbreak	1, 3, 5	Department of Health and Human Services, Facilities	BRIC, County budget	Maintain continuity of operations during disease outbreak events	TBD by available technologies	Within 5 years	High	SIP	PP
2021-Sussex County-015	Increased Computer Technology and Software for Health Department	**Problem:** The Health Department requires increased technological capabilities to track disease outbreak events, notify the public of important updates, share information between departments, and allow for registration for testing, treatment, and vaccination **Solution:** The County will invest in funds to upgrade the Health Department's computer hardware and software capabilities to better identify,	N/A	Disease Outbreak	1, 3, 5	Department of Health and Human Services	County budget	Increased County capabilities in disease outbreak events	Medium	1 year	High	LPR, EAP	ES, PI

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		respond to, and treat disease outbreak events.											
2021-Sussex County-016	Office of Bridges and Traffic Backup Power	**Problem:** Backup power sources are necessary to maintain critical services for critical facilities. The Office of Bridges and Traffic lacks a backup power source. **Solution:** Facilities will research what size generator is needed to power the Office of Bridges and Traffic. The County will then purchase and install the selected generator and necessary electrical components to supply backup power to the Office of Bridges and Traffic.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter	1, 3, 6	Facilities	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, County Budget	Ensures continuity of operations of Office of Bridges and Traffic	$50,000	Within 5 years	High	SIP	ES
2021-Sussex County-017	County Facilities Hazard Surveying	**Problem:** County facilities should be protected from hazards to maintain continuity of operations. Numerous facilities are aging and were built to standards that are lower than modern building requirements. **Solution:** The County will complete the following surveys of County Facilities: • Soil and shake characteristics with potential vulnerabilities to earthquake forces. • Structures that may be at risk during an earthquake • Wind vulnerabilities (buildings were designed to 70 mph; new updated code is 90 mph) • Structural characteristics that make them vulnerable to excessive snow and ice loads The County will then pursue necessary structural improvements that are identified by these surveys.	Existing	Earthquake, Severe Weather, Severe Winter Weather	1, 3, 6	Facilities	County Budget	Protection of County facilities.	Staff time for surveys	Within 5 years	High	SIP	PP
2021-Sussex	Frankford Wastewater	**Problem:** The Frankford Wastewater Treatment facility requires upgrade of the force main to prevent spills of sewage.	Existing	Hazardous Materials	2	County Facilities, Sussex	BRIC, County budget	Prevention of spills	$3.5-4	Within 5	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
County-018	Facility Upgrades	**Solution:** County Facilities will work with the Sussex County Utilities Authority to upgrade the force main at the Wastewater Facility.				County Municipal Utilities Authority			million	years			

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC	*Building Resilient Infrastructure and Communities Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.1-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Sussex County-001	Sheltering	1	0	1	1	1	1	0	1	1	1	1	0	1	1	11	High ⚠
2021-Sussex County-002	Warming and Cooling Centers	1	0	1	1	1	1	0	1	1	1	1	0	1	1	11	High
2021-Sussex County-003	Increase Vegetation Management Capabilities	0	1	1	1	1	1	1	1	1	1	1	0	1	1	12	High
2021-Sussex County-004	DPW Snow Load Retrofit	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Sussex County-005	FEMA HMA Informational Workshops	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-Sussex County-006	Wildfire Outreach	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2021-Sussex County-007	Repetitive Loss Mitigation Support	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2021-Sussex County-008	Update Farmland Preservation Plan	0	1	1	1	1	1	1	1	1	1	1	0	1	1	12	High
2021-Sussex County-009	Update Land Development Standards	0	1	1	1	1	1	1	1	1	1	1	0	1	1	12	High
2021-Sussex County-010	Master Circulation Plan for Transportation Update	1	1	1	1	1	1	1	1	1	1	1	0	1	1	12	High
2021-Sussex County-011	Adopt the Wastewater Management Plan	0	1	1	1	1	1	1	1	1	1	1	0	1	1	12	High
2021-Sussex County-012	Update Stormwater Pollution Prevention Plan	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High
2021-Sussex County-013	PPE for Disease Outbreak Events	1	0	1	1	1	1	0	0	1	1	0	1	1	1	10	High

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Sussex County-014	Disinfecting Equipment for County Facilities	1	0	1	1	1	1	0	1	1	1	0	0	1	1	12	High
2021-Sussex County-015	Increased Computer Technology and Software for Health Department	1	0	1	1	1	1	0	0	1	1	0	1	1	1	10	High
2021-Sussex County-016	Office of Bridges and Traffic Backup Power	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Sussex County-017	County Facilities Hazard Surveying	1	1	1	1	1	1	1	1	1	1	1	0	1	1	13	High
2021-Sussex County-018	Frankford Wastewater Facility Upgrades	0	1	1	1	1	1	0	1	1	1	0	0	1	1	10	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.1-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure	X	X	X		X			X
Disease Outbreak	X	X	X		X			X
Drought	X	X	X		X			X
Earthquake	X	X	X		X			X
Flood	X	X	X		X			X
Geologic	X	X	X		X	X	X	X
Hazardous Materials	X	X	X		X			X
Hurricane and Tropical Storm	X	X	X		X			X
Invasive Species	X	X	X		X			X
Nor'Easter	X	X	X		X			X
Severe Weather	X	X	X		X	X	X	X
Severe Winter Weather	X	X	X		X			X
Wildfire	X	X	X		X			X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.
RED high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Action Worksheet			
Project Name:	Sheltering		
Project Number:	2021-Sussex County-001		
Risk / Vulnerability			
Hazard(s) of Concern:	All hazards		
Description of the Problem:	Additional sheltering locations are needed to meet the County's sheltering needs.		
Action or Project Intended for Implementation			
Description of the Solution:	The County will establish new shelters at the Sussex County Fair Grounds (capacity of 200) and the Fredon Civic Center (capacity of 90). Shelters will be designed to meet FEMA standards and include backup power.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	500-year	**Estimated Benefits (losses avoided):**	Increased sheltering capacity
Useful Life:	25 years	**Goals Met:**	1, 3, 6
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	5 years
Estimated Time Required for Project Implementation:	Within 2 years	**Potential Funding Sources:**	HMGP, BRIC, USDA Community Facilities Grant Program, County budget
Responsible Organization:	SCDEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, Emergency management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Purchase multi-use trailers	$1M per trailer	Require deployment, limited space
	Purchase tents	$100,000 per tent and supplies	Not appropriate for during hazard events or cold weather.

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Sheltering	
Project Number:	2021-Sussex County-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Provides sheltering for the region
Property Protection	0	
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The County has the legal authority to complete the project
Fiscal	0	The project requires funding support
Environmental	1	
Social	1	Project would benefit and serve the region
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	0	Within 5 years
Agency Champion	1	SCDEM
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	DPW Snow Load Retrofit		
Project Number:	2021-Sussex County-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather		
Description of the Problem:	The Department of Public Works building does not have a roof that meets current standards for snow load. Failure of the roof could lead to a reduction in critical services by DPW before, during, and after hazard events.		
Action or Project Intended for Implementation			
Description of the Solution:	The County Facilities Department will retrofit the roof to meet current standards for snow load on the County Department of Public Works building located on Route 206.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	500-year	**Estimated Benefits (losses avoided):**	Reduction in risk of roof failure and protection of critical services
Useful Life:	25 years	**Goals Met:**	1, 2, 6
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	3 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, USDA Community Facilities Grant Program, County budget
Responsible Organization:	DPW, Facilities	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, Emergency management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Build new DPW Garage	High	Costly, unnecessary
	Build small backup garage in case of failure	High	Costly, facility unlikely to be used

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	DPW Snow Load Retrofit	
Project Number:	2021-Sussex County-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protects critical services of DPW
Property Protection	1	Protects DPW building from Winter Weather and Nor'Easter damages
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The County has the legal authority to complete the project
Fiscal	0	The project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Winter Weather, Nor'Easter
Timeline	0	5 years
Agency Champion	1	DPW, Facilities
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Repetitive Loss Mitigation Support		
Project Number:	2021-Sussex County-007		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in damages to residential properties. These properties have been repetitively flooded as documented by paid NFIP claims. The County has 16 repetitive loss properties but other properties may be impacted by flooding as well.		
Action or Project Intended for Implementation			
Description of the Solution:	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect them from future damage; repetitive loss and severe repetitive loss properties should be a priority, when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option Phase 2: Work with the property owners to implement selected action based on available funding from FEMA and local match availability.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents, creates open space, increasing flood storage.
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	2
Estimated Cost:	$2 Million	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Three years	**Potential Funding Sources:**	FEMA HMGP and FMA, local cost share by residents
Responsible Organization:	SCDEM, local NFIP Floodplain Administrator, supported by homeowners	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$500,000	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$500,000	Elevated roadways would not protect the homes from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Repetitive Loss Mitigation Support	
Project Number:	2021-Sussex County-007	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The County has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would remove families from the flood prone areas of the County.
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	3 years
Agency Champion	1	SCDEM, local NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	PPE for Disease Outbreak Events		
Project Number:	2021-Sussex County-013		
Risk / Vulnerability			
Hazard(s) of Concern:	Disease Outbreak		
Description of the Problem:	During the current COVID-19 pandemic, an adequate supply of personal protective equipment (PPE) for County staff was difficult to come by. Without proper PPE, it puts staff and emergency responders at risk to the spread of infectious diseases.		
Action or Project Intended for Implementation			
Description of the Solution:	The County will purchase PPE to create a stockpile for municipal staff. This will include gloves, masks, gowns, antibacterial handwash, antiviral cleaning solutions, sanitizers, and misters.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	PPE	**Estimated Benefits (losses avoided):**	Increase protection from diseases; decrease risk of disease spread
Useful Life:	Supply needs to be replaced after use	**Goals Met:**	1, 3, 5
Estimated Cost:	High	**Mitigation Action Type:**	Local Plans and Regulations
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 2 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	BRIC, County budget
Responsible Organization:	Department of Health and Human Services	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Shut down during disease outbreak events	N/A	Loss of continuity of operations
	Rely on state/federal distribution	$0	Supply not guaranteed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	PPE for Disease Outbreak Events	
Project Number:	2021-Sussex County-013	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protects life from disease outbreak
Property Protection	0	
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The County has the legal authority to conduct the project.
Fiscal	0	Project will require funding support.
Environmental	0	
Social	1	Project would help protect families from disease outbreak events
Administrative	1	
Multi-Hazard	0	Disease Outbreak
Timeline	1	1 year
Agency Champion	1	Department of Health and Human Services
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Disinfecting Equipment for County Facilities		
Project Number:	2021-Sussex County-014		
Risk / Vulnerability			
Hazard(s) of Concern:	Disease Outbreak		
Description of the Problem:	In order to keep County facilities open and functioning during disease outbreak events, the County will require emerging technologies for the disinfecting of County facilities		
Action or Project Intended for Implementation			
Description of the Solution:	The County Department of Health and Human Services staff will continue to research emerging technologies for the disinfecting of buildings that would allow for continuing operations during disease outbreak events. The Facilities Department will install technologies that are determined to be cost-effective.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	TBD by available technologies	**Estimated Benefits (losses avoided):**	Maintain continuity of operations during disease outbreak events
Useful Life:	25 years	**Goals Met:**	
Estimated Cost:	TBD by available technologies	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	Within 2 years	**Potential Funding Sources:**	BRIC, County budget
Responsible Organization:	Department of Health and Human Services, Facilities	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, emergency management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Hire outside consultant to address disease outbreak events	High	High cost, may not be needed at all times
	Set up plans to work remotely during all disease outbreak events	N/A	Full remote setting not possible for critical services

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Disinfecting Equipment for County Facilities	
Project Number:	2021-Sussex County-014	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Provides protection for critical services for the County
Property Protection	0	
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The County has the legal authority to complete the project
Fiscal	0	The project requires funding support
Environmental	1	
Social	1	Project would benefit and serve the region
Administrative	1	
Multi-Hazard	0	Disease Outbreak
Timeline	0	Within 5 years
Agency Champion	1	Department of Health and Human Services, Facilities
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Office of Bridges and Traffic Backup Power		
Project Number:	2021-Sussex County-016		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. The Office of Bridges and Traffic lacks a backup power source.		
Action or Project Intended for Implementation			
Description of the Solution:	Facilities will research what size generator is needed to power the Office of Bridges and Traffic. The County will then purchase and install the selected generator and necessary electrical components to supply backup power to the Office of Bridges and Traffic.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of Office of Bridges and Traffic
Useful Life:	20 years	**Goals Met:**	1, 3
Estimated Cost:	$50,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, County Budget
Responsible Organization:	County Facilities	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Office of Bridges and Traffic Backup Power	
Project Number:	2021-Sussex County-016	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Office of Bridges and Traffic
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The County has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	County Facilities
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Frankford Wastewater Facility Upgrades		
Project Number:	2021-Sussex County-018		
Risk / Vulnerability			
Hazard(s) of Concern:	Hazardous Materials		
Description of the Problem:	The Frankford Wastewater Treatment facility requires upgrade of the force main to prevent spills of sewage.		
Action or Project Intended for Implementation			
Description of the Solution:	County Facilities will work with the Sussex County Utilities Authority to upgrade the force main at the Wastewater Facility.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	TBD by force main design	**Estimated Benefits (losses avoided):**	Prevention of spills
Useful Life:	20 years	**Goals Met:**	2
Estimated Cost:	$3.5-4 million	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	Within 5 years	**Potential Funding Sources:**	BRIC, County budget
Responsible Organization:	County Facilities, Sussex County Municipal Utilities Authority	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation
Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Build secondary facility	High	Very high cost
	Remove facility	N/A	Removal of facility not a possibility
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Action Worksheet		
Project Name:	Frankford Wastewater Facility Upgrades	
Project Number:	2021-Sussex County-018	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Increase capacity of facility to prevent spills
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	Project requires funding support
Environmental	1	Prevent spills
Social	1	
Administrative	1	
Multi-Hazard	0	Hazardous Materials
Timeline	0	Within 5 years
Agency Champion	1	County Facilities, Sussex County Municipal Utilities Authority
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

9.2 BOROUGH OF ANDOVER

This section presents the jurisdictional annex for the Borough of Andover. The annex includes a general overview of the Borough of Andover; an assessment of the Borough of Andover's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.2.1 Hazard Mitigation Planning Team

The Borough of Andover followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.2-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: John Hoag, Emergency Management Coordinator Address: 137 Main Street, Andover, NJ 07821 Phone Number: (862) 268-3508 Email: j.hoag@andoverboroughnj.org	Name / Title: Jessica Casella, Deputy Emergency Management Coordinator Address: 137 Main Street, Andover, NJ 07821 Phone Number: (973) 786-6688 Email: jessiepw@yahoo.com
NFIP Floodplain Administrator	
Name / Title: Harold Pellow, Engineer Address: 137 Main Street, Andover, NJ 07821 Phone Number: (973) 948-6463	

Name	Title	Method of Participation
John Hoag	Emergency Management Coordinator	Primary point of contact, attended meetings, provided information and data, contributed to mitigation strategy, reviewed annex draft and provided comments.
Jessica Casella	Deputy Emergency Management Coordinator	Alternate point of contact.
Harold Pellow	Engineer	NFIP floodplain administrator.
Beth Brothman	Borough Clerk	Reviewed draft annex and provided comments.

9.2.2 Jurisdiction Profile

The Borough of Andover is located in southern Sussex County and bordered to the north, east and west by Andover Township and to the south by Green Township. Andover Junction Brook and Kymer Brook are two bodies of water that flow through the Borough. The Borough has a total area of 1.47 square miles and contains one unincorporated community, Andover Junction.

According to the U.S. Census, the 2010 population for the Borough of Andover was 606. The estimated 2018 population was 594, a 2.0 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 5.1 percent of the population is 5 years of age or younger and 16.7 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.2.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.2-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.2-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	0	0	0	0	0	0	0	0	0	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0	0	0	0	0	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
None identified					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None anticipated					

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.2.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Borough of Andover performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Borough of Andover identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Borough of Andover and where hazard mitigation has been integrated.

Table 9.2-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Construction Official is responsible for this code in compliance with State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Zoning Department is responsible for this code in compliance with Chapter 134-Zoning.* o *The purpose of this chapter is to encourage and promote the most appropriate use and logical development of land throughout the municipality; and therefore, to limit and to restrict and specify distances between the buildings and structures permitted therein, the nature and extent of their use and the nature and extent of the land usages in said districts.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Zoning Department is responsible for this ordinance in compliance with Chapter 121- Subdivision of Land.* o *The purpose of this chapter shall be to provide rules, regulations and standards to guide land subdivision in the Borough of Andover in order to promote the public health, safety, convenience and general welfare of the Borough. It shall be administered to ensure the orderly growth and development, the conservation, protection and proper use of land and adequate provision for traffic circulation, utilities and services.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The Engineering Department is responsible for this ordinance in compliance with Chapter 115- Stormwater Control.* o *It is the purpose of this chapter to establish minimum stormwater management requirements and controls for "major development"*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	No	-
Comment: • *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Discussed in Chapter 121: Subdivision of Land.* • *State Mandated on a municipal level. See Zoning Ordinance; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Planning and Zoning Board is responsible for these requirements in compliance with Andover Borough Code Chapter 109.*					
Environmental Protection	Yes	-	No	Yes	-
Comment: • *Chapter 9 Environmental Commission establishes an Environmental Commission in order to provide for the protection, development and use of natural resources, including water resources.*					
Flood Damage Prevention	Yes	State & Local	Yes	No	2021-Borough of Andover-004
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *Chapter 74 Flood Damage Prevention. The Ordinance designates the Engineer as the Floodplain Administrator. The ordinance requires update to include the state mandated freeboard requirement.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	No	-	No	-	-
Comment:					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen commissioners with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Planning Board is responsible for this plan in compliance with Andover Borough Master Plan and NJSA 40:55D-89.*					
Capital Improvement Plan	No	-	No	-	-
Comment:					
Disaster Debris Management Plan	No	-	No	-	2021-Borough of Andover-005
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13. • *The Engineer is responsible for this plan in compliance with Andover Borough Stormwater Management Plan, NJSA 12:5-3, and NJAC 7:8.*					
Stormwater Pollution Prevention Plan	No	-	Yes	-	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other: Open Space Plan	Yes	Local	No	Yes	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *The Open Space department is in compliance with Andover Borough Open Space Plan.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Emergency Management department is responsible for this plan, which was adopted in 2014.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	Yes	Local	No	Yes	-
Comment: *The Emergency Management department is responsible for this plan, which was adopted in 2014.*					
Continuity of Operations Plan	Yes	Local	No	Yes	-
Comment: *The Emergency Management department is responsible for this plan, which was adopted in 2014.*					
Public Health Plan	No	-	No	-	-
Comment:					
Other	No	-	No	-	-
Comment:					

Table 9.2-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Borough Clerk
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Borough of Andover.

Table 9.2-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning/Zoning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	No	-
Open Space Board / Committee	Yes	Open Space
Economic Development Commission / Committee	No	-

Staff/Personnel Resource	Available?	Department/Agency/Position
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Reverse 911, siren at Fire House
Maintenance program to reduce risk	No	-
Mutual aid agreements	Yes	County, Andover Township, Byram Township and Green Township for fire response
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Professional contract
Engineers or professionals trained in building or infrastructure construction practices	Yes	Professional contract
Planners or engineers with an understanding of natural hazards	Yes	Professional contract
Staff with training in benefit/cost analysis	Yes	Borough Engineer
Staff with training in green infrastructure	Yes	Borough Engineer
Staff with education/knowledge/training in low impact development	Yes	Borough Engineer
Surveyor	Yes	Engineering services
Stormwater engineer	No	-
Personnel skilled or trained in GIS applications	Yes	Borough Engineer
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Emergency Management Coordinator
Watershed planner	No	-
Environmental specialist	No	-
Grant writers	No	-
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Borough Engineer
Other: Professionals trained in conducting damage assessments	Yes	Borough Engineer

Fiscal Capability

The table below summarizes financial resources available to the Borough of Andover.

Table 9.2-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	No
Development Impact Fees for Homebuyers or Developers	Yes – COAH fees
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Andover.

Table 9.2-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes, Town Clerk is responsible for public information.
Do you have personnel skilled or trained in website development?	Yes, Town Clerk
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes, information is regularly updated on the site.
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	Yes, Facebook
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Disaster/safety programs are available in local schools.

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Andover.

Table 9.2-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	7/9	1997
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	None	N/A

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.2-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Dam Failure
Disease Outbreak	Disease Outbreak
Drought	Drought

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Earthquake	Earthquake
Flood	Flood
Geologic	Geological Hazards
Hazardous Materials	Hazardous Materials
Hurricane and Tropical Storm	Hurricane and Tropical Storm
Invasive Species	Infestation and Invasive Species
Nor'Easter	Nor'Easter
Severe Weather	Severe Weather
Severe Winter Weather	Severe Winter Weather
Wildfire	Wildfire

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

The Borough relies on the County and State for resources to determine the possible impacts of climate change upon the municipality. The administration is supportive of integrating climate change in policies or actions.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.2-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering
Who is your floodplain administrator? (name, department/position)	Harold Pellow, Engineer
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program exceeds FEMA and State minimum requirements.
When was the most recent Community Assistance Visit or Community Assistance Contact?	Unknown
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA would consider attending continuing education and/or certification training on floodplain management.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No. However, the Borough has considered joining CRS and would consider attending a seminar if offered.

Criterion	Response
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	3 policies $500,000 insurance in force $8,130 premium in force
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	1 claim $4,314 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	Yes

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

OPPORTUNITIES FOR FUTURE INTEGRATION

- **Flood Damage Prevention Ordinance:** The Borough will update the Flood Damage Prevention Ordinance to include the state mandated freeboard requirement. (2021-Borough of Andover-004)
- **Disaster Debris Management Plan:** The Borough will develop a Disaster Debris Management Plan. (2021-Borough of Andover-005)

9.2.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Borough of Andover's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.2-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.2-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Although the County was impacted, the Borough did not report impact
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	The Borough was subject to municipal office closures and social distancing and masking requirements.

Source: FEMA 2020, NOAA NCEI 2020

9.2.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Borough of Andover risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Andover that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Andover has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Andover.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: None

Source: FEMA 2019

Critical Facilities and LIFELINES

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.2-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
None identified			

Source: Sussex County Planning Partnership 2020

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The Fire House requires backup power.
- The Water Tower requires retrofit and wildfire protection.
- The Borough municipal building's roof requires higher standards for snow load upon replacement.
- The Flood Damage Prevention Ordinance requires update to include freeboard.
- The Borough lacks a Disaster Debris Management Plan.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Borough of Andover ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Borough of Andover. The Borough of Andover has reviewed the Sussex County hazard ranking table and has provided

input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Borough of Andover indicated the following reasons why hazard rankings have changed since the 2016 HMP:

- The Borough changed the hazard ranking for flood from medium to low, noting a lack of events and exposure.
- The Borough agreed with the remainder of the calculated hazard rankings.

Table 9.2-13. Borough of Andover Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Low	Medium	Medium	Low	Low	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.2.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.2-15 and Table 9.2-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.2-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Andover Boro-1 (revised old #6)	To ensure continuity of operations, purchase and install generators within the Borough: • Municipal water system • Municipal building Shelter	Mayor, Water Department, OEM	Complete		
Andover Boro-2 (new)	Provide information on all types of hazards, preparedness and mitigation, and responses in the Borough newsletter.	Borough	Ongoing Capability, also occurs on webpages, social media, etc.		
Andover Boro-3 (old #1)	Retrofit roof to meet current standards for snow load on Andover Borough Fire Department building located on Route 206.	Station Commander	Complete		
Andover Boro-4 (old #2)	Install 300 yards of berm on Kymer Brooke to protect Andover Borough Fire	DPW Supervisor	No Progress, no longer considered necessary.		

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update? Check if Yes	Include in the 2021 HMP Update? Enter 2021 HMP Action #
	Department located on Route 206.				
Andover Boro-5 (revised old #6)	When the roof is ready to be replaced on the municipal building, the Borough will incorporate the current snow load standards	Borough	No Progress	X	2021-Borough of Andover-003

In addition to the above progress, the Borough of Andover identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- None identified

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Andover participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Andover participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.2-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Andover would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.2-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.2-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Borough of Andover-001	Fire House Backup Power	**Problem**: Backup power sources are necessary to maintain critical services for critical facilities. The Fire House located on Route 206 lacks a backup power source. This prevents the building from being used as a backup sheltering location. **Solution:** The Borough and the Fire House will partner to apply for grant funding to purchase and install a 100kW generator and necessary electrical components to supply backup power to the Fire House. Once installed, the Fire Department will be responsible for maintenance.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter	1	Fire Department, OEM	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Assistance to Firefighters Grant Program, Fire Department Budget	Ensures continuity of operations of Fire Department and allows for sheltering	$75,000	Within 5 years	High	SIP	ES
2021-Borough of Andover-002	Water Tower Retrofit	**Problem**: The Water Tower requires retrofit to continue to be able to maintain water service. Vegetation around the base of the tower needs to be cleared. **Solution:** The Borough will complete retrofits and upgrades to the Water Tower. The Borough will clear vegetation around the Tower to prevent overgrowth and lower wildfire risk.	Existing	Drought, Wildfire	1, 2	OEM, Engineer	HMGP, BRIC, USDA Community Facilities Grant Program, Borough budget	Ensures continuity of operations of water tower, protects from wildfire impacts	High	Within 3 years	High	SIP, NSP	PP, NR
2021-Borough of Andover-003	Borough Municipal Building Retrofit	**Problem**: The Borough municipal building roof is not designed to withstand current snow load standards. Failure of the roof would result in loss of the primary Borough building and disrupt critical services.	Existing	Severe Winter Weather	2, 6	Administration, Engineer	HMGP, BRIC, USDA Community Facilities Grant	Protection of building from damage, maintain	Medium	Within 5 years	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		Solution: When the roof is ready to be replaced on the municipal building, the Borough will incorporate the current snow load standards during the design and installation of the replacement roof.					Program, Borough budget	continuity of operations.					
2021-Borough of Andover-004	Flood Damage Prevention Ordinance Update	**Problem**: The Borough's Flood Damage Prevention Ordinance lacks language to include the state mandated freeboard requirement. **Solution:** The Borough will update the Flood Damage Prevention Ordinance to include the state mandated freeboard requirement.	New	Flood	2	Administration	Borough budget	Meet state standards	Staff time	Within 6 months	High	LPR	PR
2021-Borough of Andover-005	Disaster Debris Management Plan	**Problem**: The Borough lacks a Disaster Debris Management Plan. **Solution:** The Borough will develop and adopt a Disaster Debris Management Plan. The Plan will include any necessary mutual aid discussions to supplement the Borough's capabilities.	N/A	All Hazards	5	OEM, Administration	Borough budget	Increased disaster capabilities	Staff time	2 years	High	LPR	ES

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC Program	*Building Resilient Infrastructure and Communities*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.2-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Borough of Andover-001	Fire House Backup Power	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High ⚠
2021-Borough of Andover-002	Water Tower Retrofit	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2021-Borough of Andover-003	Borough Municipal Building Retrofit	1	1	1	1	1	1	0	1	1	1	0	0	1	1	11	High
2021-Borough of Andover-004	Flood Damage Prevention Ordinance Update	0	1	1	1	1	1	1	1	1	1	0	1	1	1	12	High
2021-Borough of Andover-005	Disaster Debris Management Plan	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.2-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure					X			X
Disease Outbreak					X			X
Drought		X		X	X			X
Earthquake					X			X
Flood	X				X			X
Geologic					X			X
Hazardous Materials					X			X
Hurricane and Tropical Storm					X			X
Invasive Species					X			X
Nor'Easter					X			X
Severe Weather		X			X			X
Severe Winter Weather					X			X
Wildfire		X		X	X			X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.2-1. Borough of Andover Hazard Area Extent and Location Map 1

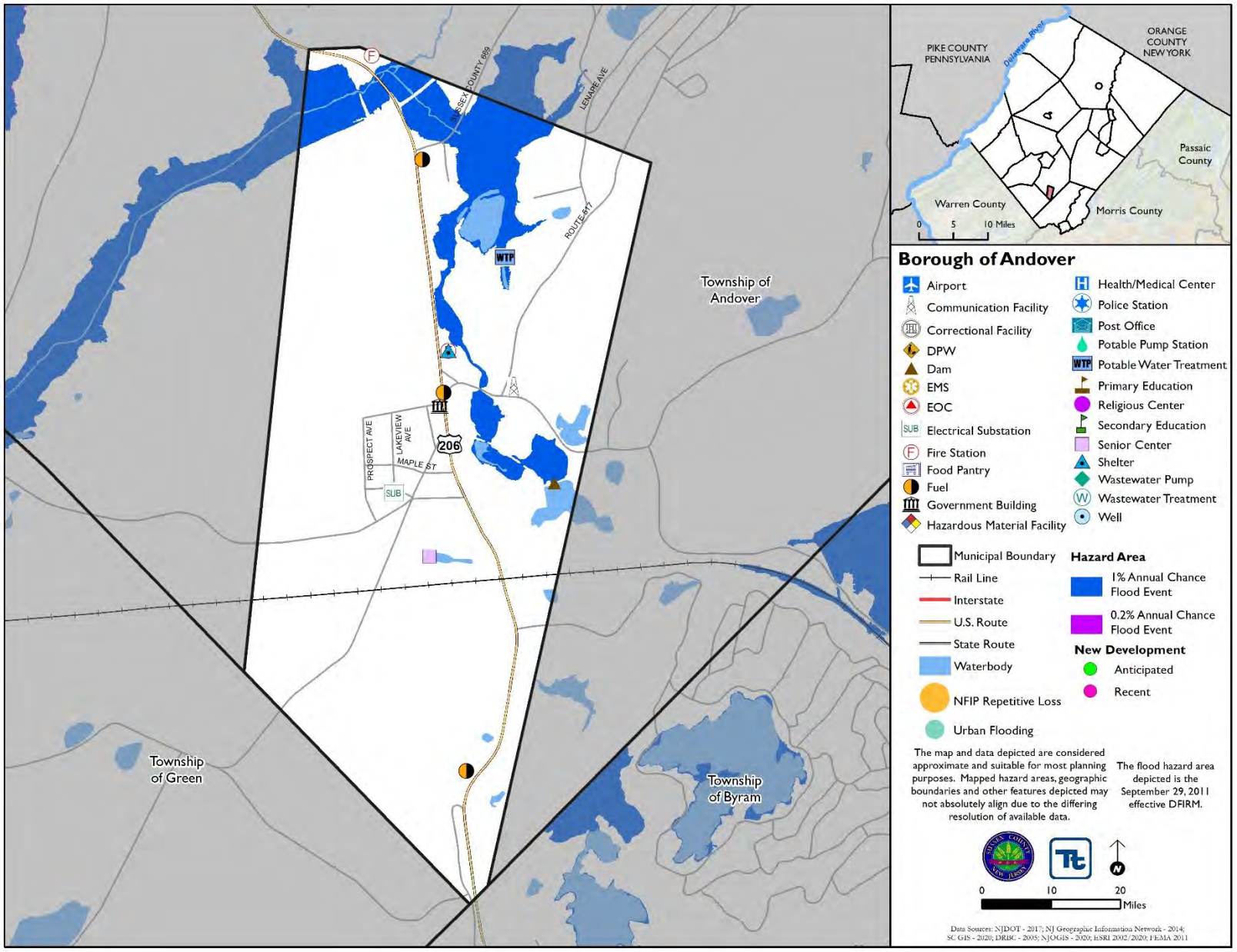


Figure 9.2-2. Borough of Andover Hazard Area Extent and Location Map 2

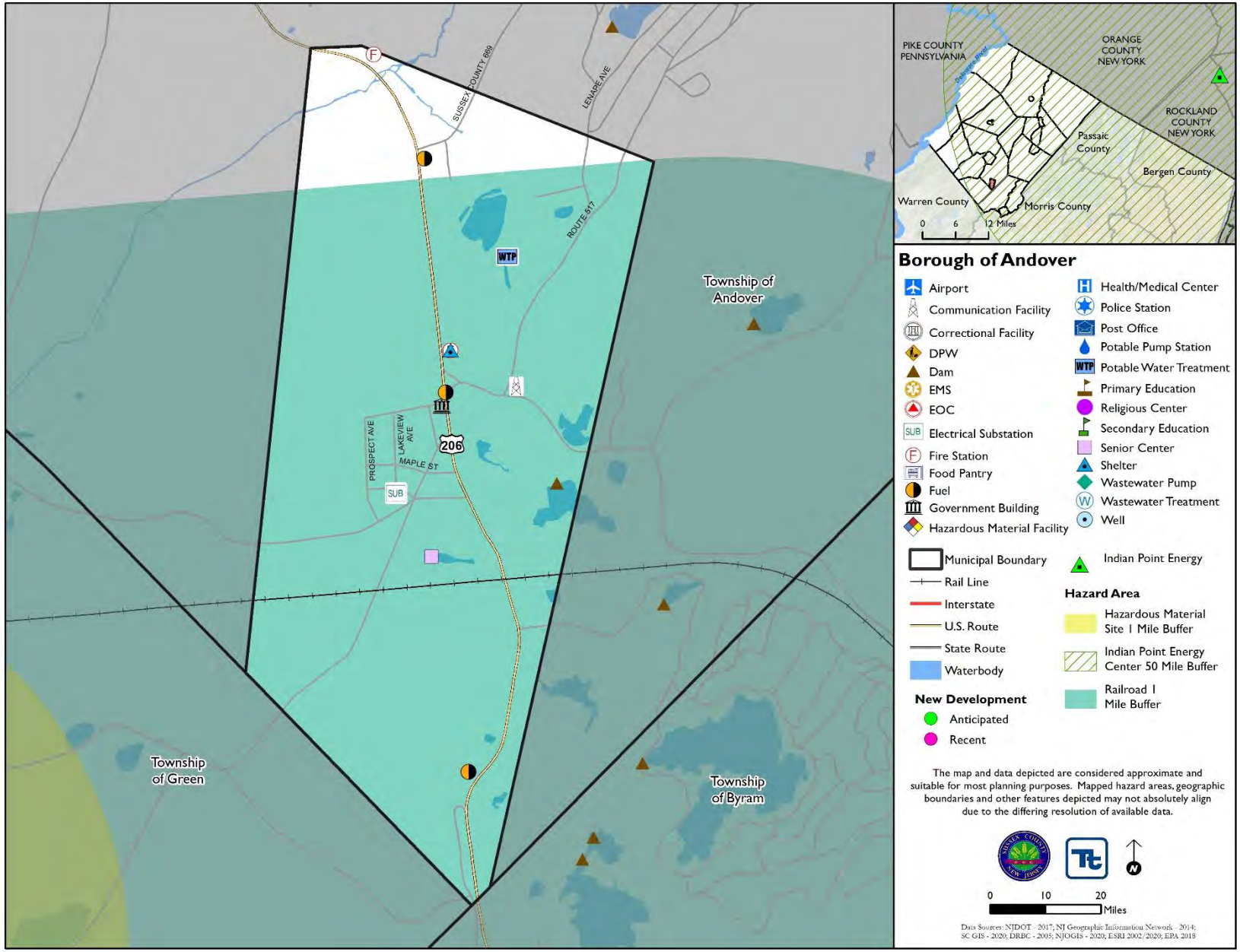
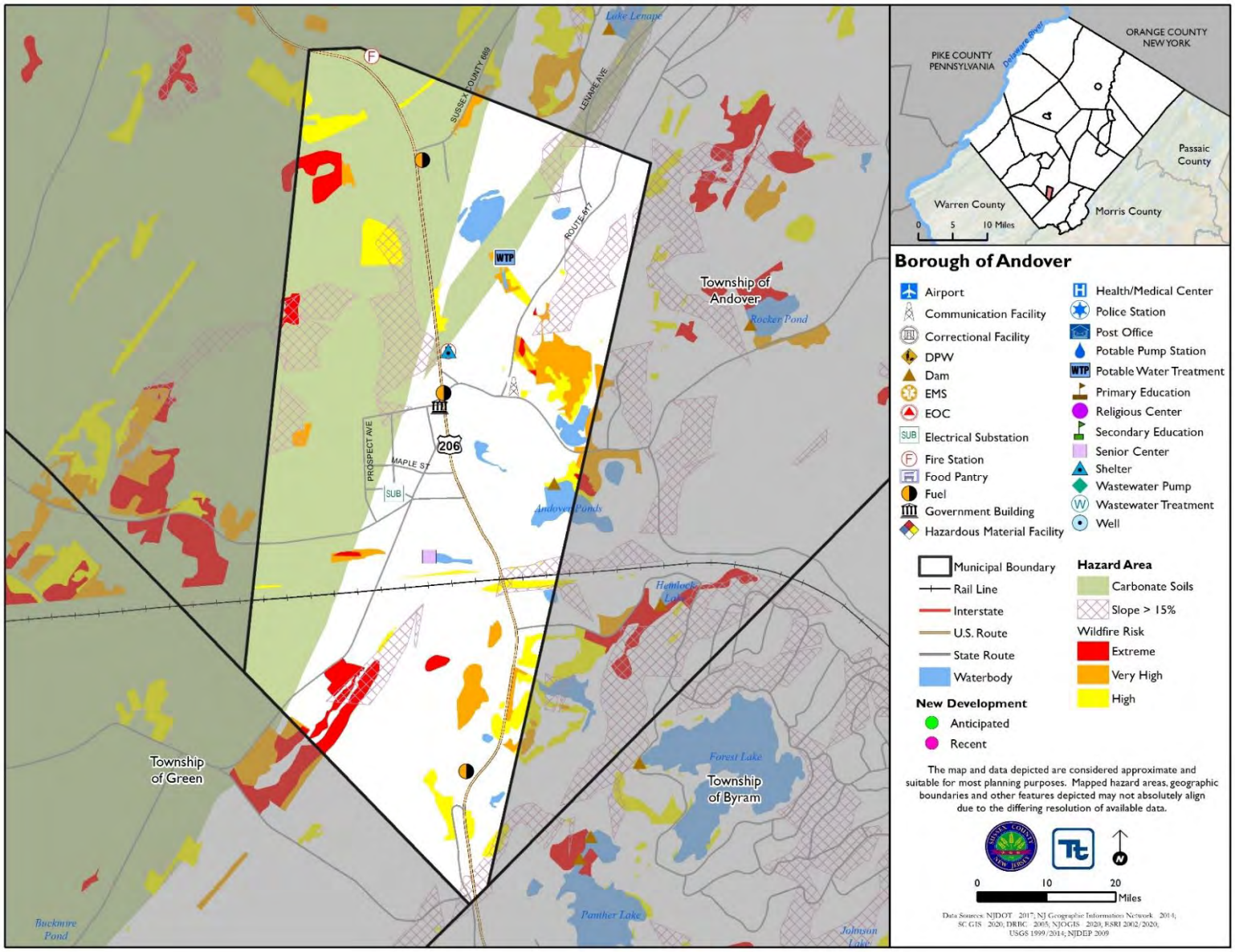


Figure 9.2-3. Borough of Andover Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Fire House Backup Power		
Project Number:	2021-Borough of Andover-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. The Fire House located on Route 206 lacks a backup power source. This prevents the building from being used as a backup sheltering location.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough and the Fire House will partner to apply for grant funding to purchase and install a 100kW generator and necessary electrical components to supply backup power to the Fire House. Once installed, the Fire Department will be responsible for maintenance.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of Fire Department and allows for sheltering
Useful Life:	20 years	**Goals Met:**	1, 3
Estimated Cost:	$75,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Assistance to Firefighters Grant Program, Fire Department Budget
Responsible Organization:	Fire Department, Borough Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Fire House Backup Power	
Project Number:	2021-Borough of Andover-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Fire House and allow for sheltering.
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Fire Department, Borough Administration
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Water Tower Retrofit		
Project Number:	2021-Borough of Andover-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Drought, Wildfire		
Description of the Problem:	The Water Tower requires retrofit to continue to be able to maintain water service. Vegetation around the base of the tower needs to be cleared.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will complete retrofits and upgrades to the Water Tower. The Borough will clear vegetation around the Tower to prevent overgrowth and lower wildfire risk.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	Modern standards for water tower design	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of water tower, protects from wildfire impacts
Useful Life:	20 years	**Goals Met:**	1, 2
Estimated Cost:	Medium	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 3 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, USDA Community Facilities Grant Program, Borough budget
Responsible Organization:	OEM, Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Rebuild water tower	High	Costly and not necessary
	Build secondary water tower to new standards	High	Costly and not necessary

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Water Tower Retrofit	
Project Number:	2021-Borough of Andover-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of water tower and maintain water service
Property Protection	1	Project will protect water tower from wildfire
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Drought, Wildfire
Timeline	1	Within 3 years
Agency Champion	1	OEM, Engineer
Other Community Objectives	1	Protection of critical services
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Borough Municipal Building Retrofit		
Project Number:	2021-Borough of Andover-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Winter Weather		
Description of the Problem:	The Borough municipal building roof is not designed to withstand current snow load standards. Failure of the roof would result in loss of the primary Borough building and disrupt critical services.		
Action or Project Intended for Implementation			
Description of the Solution:	When the roof is ready to be replaced on the municipal building, the Borough will incorporate the current snow load standards during the design and installation of the replacement roof.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	Industry snow load standards	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of municipal building
Useful Life:	20 years	**Goals Met:**	2, 6
Estimated Cost:	Medium	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, USDA Community Facilities Grant Program, Borough budget
Responsible Organization:	Administration, Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Rebuild facility to new standards	High	Costly and not necessary
	Build secondary facility protected to new standards	High	Costly and not necessary

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Borough Municipal Building Retrofit	
Project Number:	2021-Borough of Andover-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of municipal building
Property Protection	1	Project will protect municipal building from winter storm damage.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	Severe Winter Weather
Timeline	0	Within 5 years
Agency Champion	1	Administration, Engineer
Other Community Objectives	1	Protection of critical services
Total	11	
Priority (High/Med/Low)	High	

9.3 TOWNSHIP OF ANDOVER

This section presents the jurisdictional annex for the Township of Andover. The annex includes a general overview of the Township of Andover; an assessment of the Township of Andover's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.3.1 Hazard Mitigation Planning Team

The Township of Andover followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.3-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Chief Eric Danielson, Emergency Management Coordinator Address: 134 Newton-Sparta Road, Newton, NJ 07860 Phone Number: (862) 266-1396 Email: edanielson@atpd.org	Name / Title: Ptl. Georgios Laoudis, Deputy Coordinator Address: 134 Newton-Sparta Road, Newton, NJ 07860 Phone Number: (862) 881-6032 Email: glaoudis@atpd.org
NFIP Floodplain Administrator	
Name / Title: Cory Stoney, Township Engineer Address: 17 Plains Road Augusta, NJ 07822 Phone Number: (973) 948-6463 Email: cstoner@hpellow.com	

Name	Title	Method of Participation
Chief Eric Danielson	Emergency Management Coordinator	Primary point of contact, provided information and data for annex development, contributed to mitigation strategy, reviewed the annex
Ptl. Georgios Laoudis	Deputy Coordinator	Alternate point of contact, provided information and data for annex development, contributed to mitigation strategy, attended the kickoff meeting and annex training
Corey Stoney	Township Engineer	NFIP Floodplain Administrator

9.3.2 Jurisdiction Profile

Andover Township is located in southern Sussex County and bordered to the north by the Townships of Hampton and Lafayette, to the south by the Townships of Green and Byram, to the east by the Township of Sparta and to the west by the Town of Newton and Fredon Township. Brighton, Clearwater, Pinkeyville, Springdale, Whitehall and Wawayanda are unincorporated communities in the Township. It has a total area of 20.7 square miles. Paulins Kill, Kymer Brook, Tar Hill Brook, Pequest River, and Andover Junction Brook are the bodies of water that flow through Andover Township.

According to the U.S. Census, the 2010 population for the Township of Andover was 6,319. The estimated 2018 population was 5,996, a 5.1 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 5.1 percent of the population is 5 years of age or younger and 23.2 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.3.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.14-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.3-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	6	0	5	0	4	0	4	0	2	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0	0	0	0	0	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
Pace Glass	Commercial	1	1045 Limecrest Road	Nuclear Incident Hazard Area, Carbonate Soil	Construction in progress
Perona Farms Addition	Commercial	1	350 Andover Sparta Road	Nuclear Incident Hazard Area	Construction in progress
Darla Enterprises	Commercial	1	40 Newton-Sparta Road	Nuclear Incident Hazard Area, Hazardous Material Hazard Area	Approved by Board
LAC Realty Corp (AG Pizza)	Commercial	1	131 Newton-Sparta Road	Nuclear Incident Hazard Area	Completed
Rupa Management LLC	Commercial	1	241 Newton-Sparta Road	Nuclear Incident Hazard Area	Completed
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None anticipated					

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.3.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Andover performed an inventory and analysis of

existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Andover identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Andover and where hazard mitigation has been integrated.

Table 9.3-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *This code follows State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Land Use Board is responsible for this code in compliance with Chapter 190.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. • *The Land Use Board is responsible for this ordinance in compliance with Chapter 159.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The DPW is responsible for this ordinance in compliance with Chapter 150.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	No	State, Division of Consumer Affairs	Yes	No	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.* • *The Andover Township Planning Board is responsible for these ordinances in compliance with a part of the Master Plan.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Land Use Board is responsible for these requirements in compliance with Chapter 131.*					
Environmental Protection	No	-	No	-	-
Comment:					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	2021-Andover Township-009
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *Chapter 55- Flood Damage Prevention*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:* o *A. To protect human life and health;* o *B. To minimize expenditure of public money for costly flood control projects;* o *C. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* o *D. To minimize prolonged business interruptions;* o *E. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;* o *F. To help maintain a stable tax base by providing for the alternate use and development of areas of special flood hazard so as to minimize future flood blight areas;* o *G. To ensure that potential buyers are notified that property is in an area of special flood hazard; and* o *H. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.* • *The ordinance lacks the state mandated freeboard requirement.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	No	-	No	-	-
Comment:					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Yes	Local	No	No	-
Comment: *The Land Use Board is responsible for these ordinances in compliance with Chapter 150-11.*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	No	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen commissioners with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Plan was last reexamined in 2010.* • *The Andover Township Land Use Board is responsible for this plan.*					
Capital Improvement Plan	Yes	Local	No	No	-
Comment: *The Andover Township is responsible for this plan in compliance with Resolution.*					
Disaster Debris Management Plan	No	-	No	-	2021-Andover Township-008
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Floodplain or Watershed Plan	No	-	No	-	-
Stormwater Management Plan	Yes	Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The Andover Township and DPW is responsible for this plan in compliance with Chapter 150 Stormwater Management.*					
Stormwater Pollution Prevention Plan	No	-	Yes	-	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component. The latest rule amendments took effect January 1, 2018.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	Yes	Local	No	Yes	-
Comment: *The Andover Township is responsible for this plan in compliance with Chapter 3-70 of the Municipal Code.*					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other: Open Space Plan	Yes	Local	No	No	-
Comment: • *The Andover Township is responsible for this plan in compliance with Resolution.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	No	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Office of Emergency Management is responsible for this plan.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	No	-	No	-	-
Comment:					
Other	No	-	No	-	-
Comment: •					

Table 9.3-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, The Construction Official grants the permits per Chapter 55 of the Municipal Code
Does your jurisdiction have the ability to track permits by hazard area?	No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No, the 2016 Housing Element & Fair Share Plan stated that the estimated total housing units in 2014 was 2,168 and due to current land use and NJDEP restrictions, any additional development would be limited.

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Andover.

Table 9.3-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Land Use Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Environmental Commission
Open Space Board / Committee	Yes	Open space committee
Economic Development Commission / Committee	Yes	Economic Advisory Committee
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Police Dispatch Center
Maintenance program to reduce risk	Yes	AT DPW
Mutual aid agreements	Yes	Police/Fire/EMS/DPW
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Both Twp planner and Twp engineer
Engineers or professionals trained in building or infrastructure construction practices	Yes	DCA is Twp construction officials
Planners or engineers with an understanding of natural hazards	Yes	DCA
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	No	-
Staff with education/knowledge/training in low impact development	No	-
Surveyor	No	Subcontracted as necessary by engineer
Stormwater engineer	No	-
Personnel skilled or trained in GIS applications	No	Refer to Sussex County GIS Dept
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	AT OEM
Watershed planner	No	-
Environmental specialist	No	-
Grant writers	No	-
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Construction Official (as per Township Code)

Fiscal Capability

The table below summarizes financial resources available to the Township of Andover.

Table 9.3-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes

Financial Resource	Accessible or Eligible to Use?
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Andover.

Table 9.3-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes, disaster/safety programs in/for schools

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Andover.

Table 9.3-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	Zoning/code enforcement	Unknown
Public Protection (Fire ISO Protection Class)	Yes	5	2014
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.3-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

The Township does not have access to resources to determine the possible impacts of climate change upon the municipality. The administration is not currently supportive of integrating climate change in policies or actions.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.3-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering Department
Who is your floodplain administrator? (name, department/position)	Corey Stoner, Township Engineer
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	July 11, 2011. The flood damage prevention ordinance requires update to include the state's freeboard requirement.
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets the minimum requirements.
When was the most recent Community Assistance Visit or Community Assistance Contact?	November 24, 1987
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes

Criterion	Response
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA also stated that he would consider attending continuing education and/or certification training on floodplain management if it were offered in the County.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No. The jurisdiction is not interested in joining the CRS program.
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	4 policies $1,260,000 insurance in force $1,924 premium in force
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	2 claims $304 in payments
Do you maintain a list of properties that have been damaged by flooding?	Yes
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

Additional Areas of Existing Integration

- **Township Website:** The Township hosts a municipal website (https://www.andovertwp.org/) which includes a municipal directory, announcements, and other community information.

Opportunities for Future Integration

- **Incorporate Hazard Mitigation in Budgeting:** The Township will budget for future mitigation projects in both the Township budget and Capital Improvement Budget (2021-Andover Township-003).
- **Resilience Committee and Advisor:** The Township will establish a community resilience committee and advisor (2021-Andover Township-004).
- **Continuity of Operations Plan:** The Township will develop and adopt a Continuity of Operations Plan (2021-Andover Township-005).
- **FireWise Program:** The Township will enroll and maintain status within the FireWise program (2021-Andover Township-006).
- **Hazard Outreach Improvements:** The Township will expand mitigation education and outreach efforts through handouts, newsletters, social media, and the Township website (2021-Andover Township-007).
- **Disaster Debris Management Plan:** The Township will develop and adopt a Disaster Debris Management Plan (2021-Andover Township-008).
- **Flood Damage Prevention Ordinance:** The Township will update the Flood Damage Prevention Ordinance to include freeboard (2021-Andover Township-009).

9.3.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Andover's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.14-11 provides details regarding municipal-specific loss and

damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.3-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Although the County was impacted, the Township did not report damages.
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	The Township was impacted by social distancing and masking requirements.

Source: FEMA 2020, NOAA NCEI 2020

9.3.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Andover risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Andover that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Andover has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Andover.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: None have been identified

Source: FEMA 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.3-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
None identified			

Source: Sussex County Planning Partnership 2020

Note:
**Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- Stormwater flooding is a problem at Pierce Road.
- Stormwater flooding is a problem at Old Creamery Road & Hemlock Avenue.
- The Township requires funding to fund mitigation projects in house or provide match for grants.
- The Township requires better coordination and staff knowledge on community resilience to inform hazard mitigation planning and project implementation.
- The Township lacks a Continuity of Operations Plan.
- The Township has wildfire risk but is not enrolled in the FireWise program.
- The Township's outreach on hazard mitigation topics requires expansion.
- The Township lacks a Disaster Debris Management Plan.
- The flood damage prevention ordinance requires update to include the state's freeboard requirement.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Andover ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Andover. The Township of Andover has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Andover indicated the following reasons why hazard rankings have changed since the 2016 HMP:

- The Township agreed with the calculated hazard rankings.

Table 9.3-13. Township of Andover Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.3.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.14-15 and Table 9.14-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.3-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Andover Twp-1 (LOI; new)	Ensure continuity of operations at critical facilities and municipal buildings. Identified at this time: Install backup generator for critical infrastructure that includes the Township firehouse (shelter), town hall and DPW.	Township and OEM	Complete		
Andover Twp-2 (new)	Pierce Road – stormwater retention basin	Township and Engineer	No Progress	X	2021-Andover Township-001
Andover Twp-3 (new)	Pinkeyville Road – stormwater retention basin	Township and Engineer	Complete		
Andover Twp-4 (new)	Budget for future mitigation projects in both the Township budget and Capital Improvement Budget.	OEM Director and Township Administrator	In Progress	X	2021-Andover Township-003
Andover Twp-5 (new)	Identify critical and essential Township facilities for location in hazard areas; identify mitigation actions to protect these structures from future damage.	OEM Director and Township Administrator	Ongoing Capability through HMP planning process		
Andover Twp-6 (new)	The Township will establish a community resilience committee and advisor.	OEM Director and Township Administrator	No Progress	X	2021-Andover Township-004
Andover Twp-7 (new)	Improve outreach to local schools, colleges and universities; establish relationships; assist with community service and hazard mitigation activities.	OEM Director and Township Administrator	Complete		
Andover Twp-8 (new)	The Township will develop a COOP and it will integrate mitigation.	OEM Director and Township Administrator	No Progress	X	2021-Andover Township-005
Andover Twp-9 (old #3)	Implementation of Fire Wise community program	Township Fire and OEM	In Progress	X	2021-Andover Township-006

2016 Action Number Action Description		Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Andover Twp-10 (old #4)	Upgrade roof of Long Pond School to current snow load and high wind standards	Andover Regional Board of Education / OEM	Complete		
Andover Twp-11 (old #5)	Upgrade roof of FMB School to current snow load and high wind standards	Andover Regional Board of Education / OEM	Complete		
Andover Twp-12 (old #6)	Inundation study for Hidden Valley Lake Dam / Bonnie Glen Court	Hidden Valley Lake Association	Complete		
Andover Twp-13 (old #7)	Inundation study for Lake Lenape Dam / Old Creamery Road	Hidden Valley Lake Association	Complete		
Andover Twp-14 (old #8)	Stormwater retention basin – Old Creamery Rd & Hemlock Ave	Township and Engineer	No Progress	X	2021-Andover Township-002
Andover Twp-15 (revised old #9)	Expand mitigation education and outreach efforts through handouts, newsletters, social media, and Township website.	OEM	In Progress	X	2021-Andover Township-007

In addition to the above progress, the Township of Andover identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- None identified

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Andover participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Andover participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.14-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Andover would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.14-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.3-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Andover Township-001	Pierce Road Stormwater Retention Basin	**Problem**: Stormwater flooding is a problem at Pierce Road. **Solution:** The Township will design and install a stormwater retention basin on Pierce Road.	New	Flood, Severe Weather	2	Engineer, Public Works	HMGP, BRIC, Township budget	Reduction in flood risk	High	Within 5 years	High	SIP	SP
2021-Andover Township-002	Old Creamery Rd & Hemlock Ave Stormwater Retention Basin	**Problem**: Stormwater flooding is a problem at Old Creamery Road & Hemlock Avenue. **Solution:** The Township will design and install a stormwater retention basin on Old Creamery Road & Hemlock Avenue.	New	Flood, Severe Weather	2	Engineer, Public Works	HMGP, BRIC, Township budget	Reduction in flood risk	High	Within 5 years	High	SIP	SP
2021-Andover Township-003	Incorporate Hazard Mitigation in Budgeting	**Problem**: The Township requires funding to fund mitigation projects in house or provide match for grants. **Solution:** The Township will budget for future mitigation projects in both the Township budget and Capital Improvement Budget.	Both	All Hazards	5	OEM Director and Township Administrator	Township budget, Finance Department	Increased financial capability	Medium	1 year	Medium	LPR	PP, SP, PI, NR
2021-Andover Township-004	Resilience Committee and Advisor	**Problem**: The Township requires better coordination and staff knowledge on community resilience to inform hazard mitigation planning and project implementation. **Solution:** The Township will establish a community resilience committee and advisor.	Both	All Hazards	1, 2, 3, 4, 5, 6, 7	OEM Director, Township Administrator	Township budget	Increased resilience knowledge and capabilities	High	Within 5 years	Medium	LPR	PR
2021-Andover Township-005	Continuity of Operations Plan	**Problem**: The Township lacks a Continuity of Operations Plan. **Solution:** The Township will develop and adopt a Continuity of Operations Plan.	Existing	All Hazards	3, 5, 6	OEM, Administration	Township budget	Increased emergency capability	Low	1 year	Medium	LPR	ES
2021-Andover Township-006	FireWise Program	**Problem**: The Township has wildfire risk but is not enrolled in the FireWise program. **Solution:** The Township will enroll and maintain status within the FireWise program.	Both	Wildfire	1, 2, 3	Township Fire and OEM	Township budget	Increase wildfire protection	Staff time	Within 5 years	Medium	LPR	PP, PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Andover Township-007	Hazard Outreach Improvements	**Problem**: The Township's outreach on hazard mitigation topics requires expansion. **Solution:** The Township will expand mitigation education and outreach efforts through handouts, newsletters, social media, and the Township website.	N/A	All hazards	4	OEM	Township budget	Educated public	$1,000	Within 1 year	High	EAP	PI
2021-Andover Township-008	Disaster Debris Management Plan	**Problem**: The Township lacks a Disaster Debris Management Plan. **Solution:** The Township will develop and adopt a Disaster Debris Management Plan.	Existing	All hazards	3, 5, 6	OEM, Public Works	Township budget	Increased disaster capability	Staff time	1 year	High	LPR	ES
2021-Andover Township-009	Flood Damage Prevention Ordinance Update	**Problem:** The Township's Flood Damage Prevention Ordinance lacks the state mandated freeboard requirement. **Solution:** The Township will update the Flood Damage Prevention Ordinance to include the freeboard requirement.	New	Flood	2	FPA, Administration	Township budget	Meet state standards, reduce future flood risk	Staff time	6 months	High	LPR	PR

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC program	*Building Resilient Infrastructure and Communities*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.3-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Andover Township-001	Pierce Road Stormwater Retention Basin	0	1	0	1	1	1	0	1	1	0	1	0	1	1	9	High ⚠
2021-Andover Township-002	Old Creamery Rd & Hemlock Ave Stormwater Retention Basin	0	1	0	1	1	1	0	1	1	0	1	0	1	1	9	High
2021-Andover Township-003	Incorporate Hazard Mitigation in Budgeting	0	0	1	1	0	1	1	0	0	0	1	1	1	1	8	Medium
2021-Andover Township-004	Resilience Committee and Advisor	1	1	0	1	1	1	1	1	1	1	1	0	1	1	12	High
2021-Andover Township-005	Continuity of Operations Plan	1	1	1	1	1	1	1	0	1	1	1	1	1	1	13	High
2021-Andover Township-006	FireWise Program	1	1	0	1	1	1	1	1	0	0	0	0	0	1	8	Medium
2021-Andover Township-007	Hazard Outreach Improvements	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-Andover Township-008	Disaster Debris Management Plan	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High
2021-Andover Township-009	Flood Damage Prevention Ordinance Update	0	1	1	1	1	1	1	1	1	1	0	1	1	1	12	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.3-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure	X		X		X			X
Disease Outbreak	X		X		X			X
Drought	X		X		X			X
Earthquake	X		X		X			X
Flood	X		X		X	X		X
Geologic	X		X		X			X
Hazardous Materials	X		X		X			X
Hurricane and Tropical Storm	X		X		X			X
Invasive Species	X		X		X			X
Nor'Easter	X		X		X			X
Severe Weather	X		X		X	X		X
Severe Winter Weather	X		X		X			X
Wildfire	X	X	X		X			X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.3-1. Township of Andover Hazard Area Extent and Location Map 1

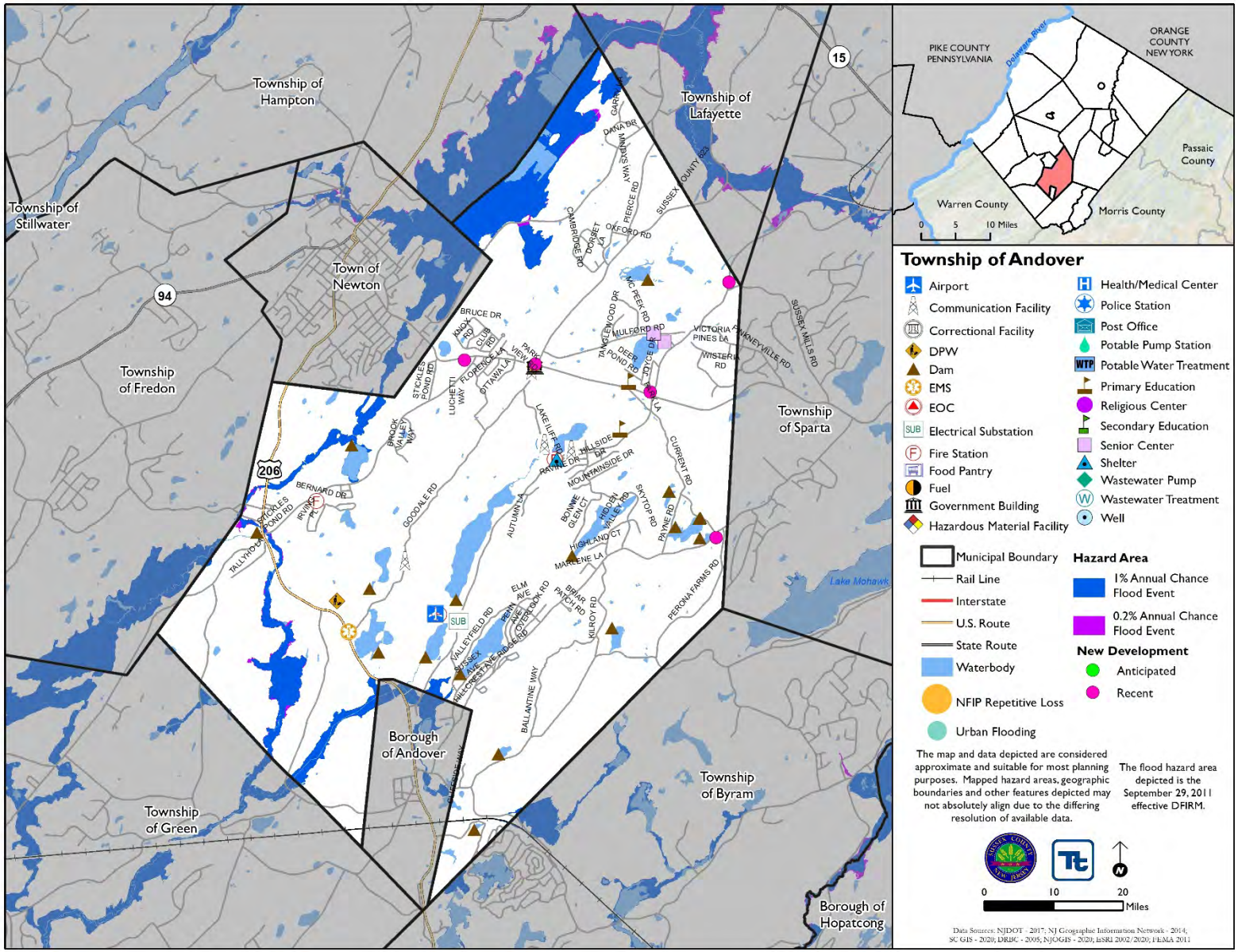


Figure 9.3-2. Township of Andover Hazard Area Extent and Location Map 2

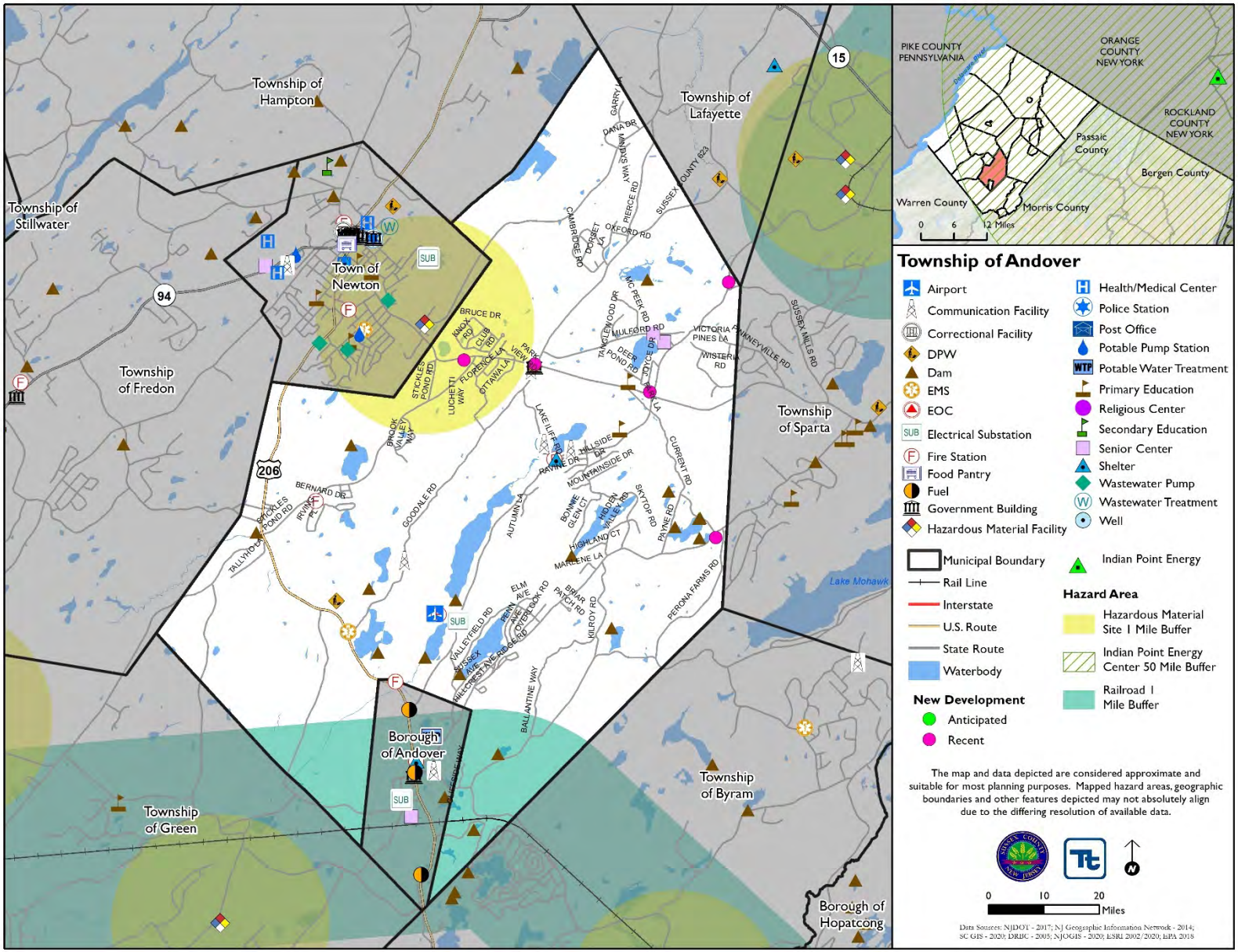
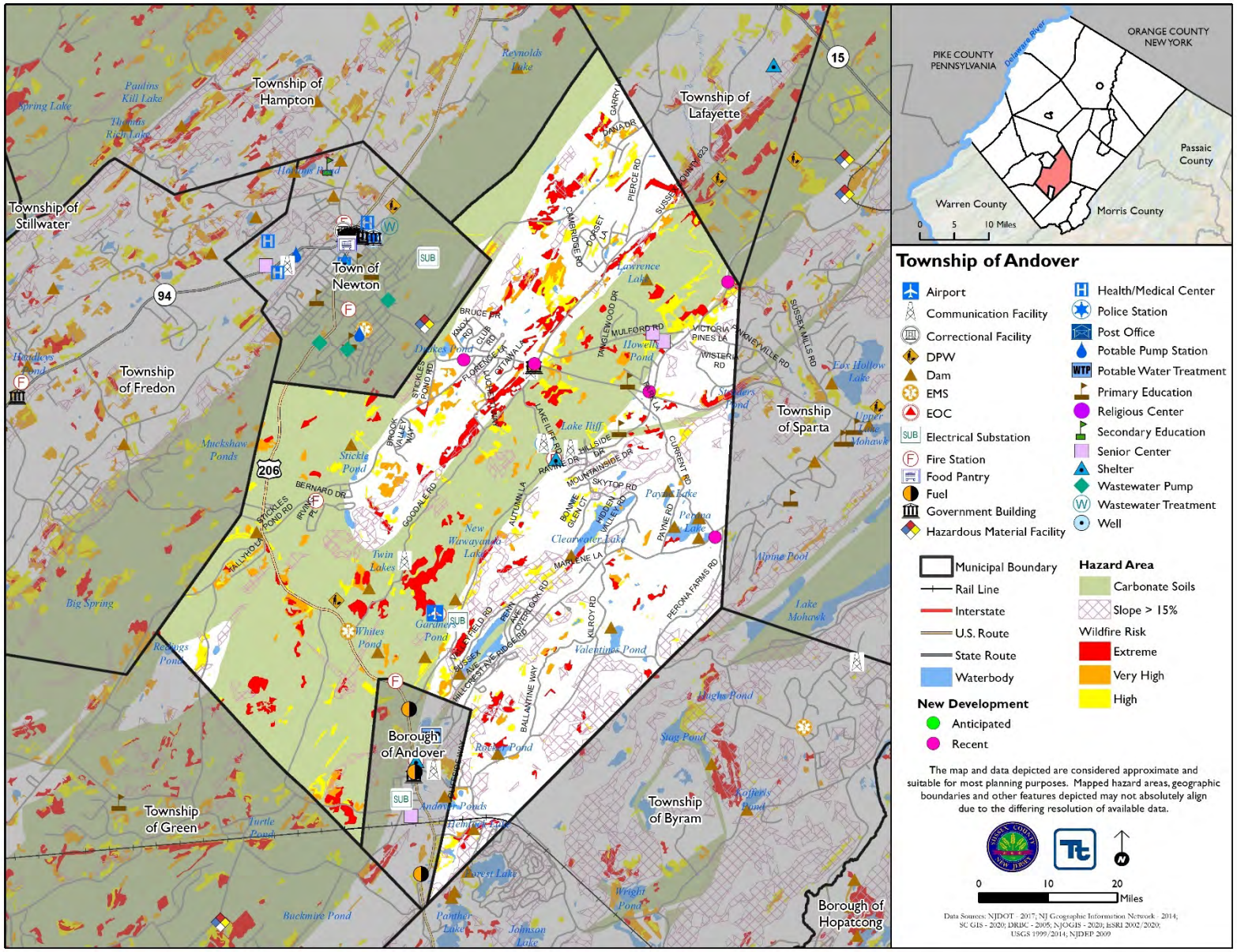


Figure 9.3-3. Township of Andover Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Pierce Road Stormwater Retention Basin		
Project Number:	2021-Andover Township-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Stormwater flooding is a problem at Pierce Road.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township Engineer will design and install a stormwater retention basin on Pierce Road. Public Works will be responsible for upkeep and maintenance of the basin.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD by design specifications	**Estimated Benefits (losses avoided):**	Reduction in flood risk
Useful Life:	30 years	**Goals Met:**	2
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	6 months	**Potential Funding Sources:**	HMGP, BRIC, Township budget
Responsible Organization:	Engineer, Public Works	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, Stormwater management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate roadway	$500,000	Costly and may not solve problem
	Relocate roadway	N/A	Not possible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Pierce Road Stormwater Retention Basin	
Project Number:	2021-Andover Township-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Protects roadway from flood damage
Cost-Effectiveness	0	
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	1	
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	Within 5 years
Agency Champion	1	Engineer, Public Works
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Old Creamery Rd & Hemlock Ave Stormwater Retention Basin		
Project Number:	2021-Andover Township-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Stormwater flooding is a problem at Old Creamery Road & Hemlock Avenue.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township Engineer will design and install a stormwater retention basin at Old Creamery Road & Hemlock Avenue. Public Works will be responsible for upkeep and maintenance of the basin.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD by design specifications	**Estimated Benefits (losses avoided):**	Reduction in flood risk
Useful Life:	30 years	**Goals Met:**	2
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	6 months	**Potential Funding Sources:**	HMGP, BRIC, Township budget
Responsible Organization:	Engineer, Public Works	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, Stormwater management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate roadway	$500,000	Costly and may not solve problem
	Relocate roadway	N/A	Not possible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Old Creamery Rd & Hemlock Ave Stormwater Retention Basin	
Project Number:	2021-Andover Township-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Protects roadway from flood damage
Cost-Effectiveness	0	
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	1	
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	Within 5 years
Agency Champion	1	Engineer, Public Works
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

9.4 BOROUGH OF BRANCHVILLE

This section presents the jurisdictional annex for the Borough of Branchville. The annex includes a general overview of the Borough of Branchville; an assessment of the Borough of Branchville's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.4.1 Hazard Mitigation Planning Team

The Borough of Branchville followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.4-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Jeff Lewis, OEM Coordinator Address: 5 Main Street, P.O. Box 840, Branchville, NJ 07826 Phone Number: (973) 479-7203 Email: jlewis310@embarqmail.com	Name / Title: Kate Leissler, Borough Clerk Address: 5 Main Street, P.O. Box 840, Branchville, NJ 07826 Phone Number: (973) 948-4626 Email: branchvilleclerk@yahoo.com
NFIP Floodplain Administrator	
Name / Title: Dave Simmons, Consultant/Engineer Address: 17 Plains Road Augusta, New Jersey 07822 Phone Number: (973) 948-6463 Email: DSimmons@hpellow.com	

Name	Title	Method of Participation
Jeff Lewis	Emergency Management Coordinator	Primary point of contact, attended the annex training, risk assessment meeting and mitigation workshop; assisted with annex development by providing data and information; updated the mitigation strategy development; point of contact
Kate Leissler	Borough Clerk	Alternate point of contact
Dave Simmons	Consultant/Engineer	NFIP floodplain administrator

9.4.2 Jurisdiction Profile

The Borough of Branchville is located in northwestern Sussex County and surrounded entirely by the Township of Frankford. Culvers Creek and Dry Brook both flow through the Borough. The Borough has a total area of 0.6 square miles.

According to the U.S. Census, the 2010 population for the Borough of Branchville was 841. The estimated 2018 population was 896, a 6.5 percent increase from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 6.9 percent of the population is 5 years of age or younger and 14.3 percent is

65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.4.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.4-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.4-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units										
Multi-Family										
Other (commercial, mixed-use, etc.)										
Property or Development Name	**Type of Development**		**# of Units / Structures**		**Location** (address and/or block and lot)		**Known Hazard Zone(s)***		**Description / Status of Development**	
Recent Major Development and Infrastructure from 2015 to Present										
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years										

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.4.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Borough of Branchville performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and

each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Borough of Branchville identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Borough of Branchville and where hazard mitigation has been integrated.

Table 9.4-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Mayor and Council are responsible for this code in compliance with State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).* • *State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.)*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Mayor and Council are responsible for this code in compliance with Chapter 123- Zoning. New zoning procedures recognize natural hazard areas.*					
Subdivisions	Yes	State	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Mayor and Council are responsible for this ordinance in compliance with Chapter 104- Subdivision of Land.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The Mayor and Council are responsible for this ordinance in compliance with Chapter 121-6.* • *Ecode Chapter 121 Stormwater Management: https://ecode360.com/8956544. Adopted by the Mayor and the Council of the Borough of Branchville 3-15-2006 by Ord. No. 3-2006. Amendments noted where applicable.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
Comment: • *N.J.A.C. 13:45A-29.1 – Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also – Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.* • *The Mayor Council is responsible for this code in compliance with Chapter 123- Zoning. New zoning procedures recognize natural hazard areas.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Mayor and Council are responsible for these requirements in compliance with Chapter 97-3.*					
Environmental Protection	No	-	No	-	-
Comment:					
Flood Damage Prevention	Yes	Local	Yes	Yes	2021-Branchville-005
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Mayor and Council are responsible for this ordinance in compliance with Chapter 64- Flood Damage Prevention. It is the purpose of this chapter, to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:* o *Protect human life and health; Minimize expenditure of public money for costly flood control projects; Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public; Minimize prolonged business interruptions; Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard; Help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas; Ensure that potential buyers are notified that property is in an area of special flood hazard; and Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50% of the market value of the structure before the damage occurred.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	No	-	No	-	-
Comment:					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Municipal Separate Storm Sewer System (MS4)	Yes	Local	Yes	Yes	-
Comment: • *The Mayor and Council are responsible for this ordinance in compliance with Chapter 144 – Sewage Disposal Systems, Individual.*					
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Yes	Local	No	Yes	-
Comment: • *The Borough is responsible for these ordinances in compliance with Chapter 111 – Trees and Shrubbery and Chapter 131 – Flooding and Standing Water.*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Mayor and Council are responsible for this plan in compliance with Code Chapters: Chapter 97-19.*					
Capital Improvement Plan	Yes	Local	No	No	-
Comment: *The Mayor and Council are responsible for this plan in compliance with Code Chapters: Chapter 104-B.*					
Disaster Debris Management Plan	No	-	No	-	2021-Branchville-003
Comment:					
Floodplain or Watershed Plan	Yes	County	No	Yes	-
Comment: *The Mayor and Council are responsible for this plan. Water Resources Plan for the Delaware River Basin (Basin Plan).*					
Stormwater Management Plan	Yes	Local	Yes	Yes	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The Mayor and Council are responsible for this plan in compliance with Chapter 121 Storm Water Management.*					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	Yes	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other	No	-	No	-	-
Comment:					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Mayor, Council, and Office of Emergency Management are responsible for this plan.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	State	No	Yes	-
Comment: • *According to 44 CFR 201.4 (c)(2), states are required to undertake a risk assessment that provides the factual basis for developing a mitigation strategy. The State of New Jersey risk assessment shall include an overview of the location of all-natural hazards that can affect the State, including information on previous occurrences of hazard events as well as the probability of future hazard events, using maps where appropriate.* • *All information on the risk assessment can be found in Section 5, as well as the referenced supporting appendices. For ease of review, the vulnerability assessment follows each hazard profile, so that all information about a specific hazard is continuous. This section describes the identification of hazards, Presidential disaster declarations, hazard profiles, and the vulnerability assessment.*					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	No	-	No	-	-
Comment:					
Other Plans	No	-	No	-	-
Comment:					

Table 9.4-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Zoning Department
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes, the Borough completed a Housing Element and a buildable lands inventory.

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of Branchville.

Table 9.4-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	No	Mayor & Council
Environmental Board / Commission	No	Mayor & Council
Open Space Board / Committee	No	Mayor & Council
Economic Development Commission / Committee	No	Mayor & Council
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	OEM- Reverse 9-1-1; Borough Clerk
Maintenance program to reduce risk	No	Mayor & Council
Mutual aid agreements	Yes	Mayor Council OEM Fire Chief
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Mayor & Council
Engineers or professionals trained in building or infrastructure construction practices	Yes	Mayor & Council
Planners or engineers with an understanding of natural hazards	Yes	Mayor & Council
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes	Harold Pellow & Associates
Staff with education/knowledge/training in low impact development	Yes	Harold Pellow & Associates
Surveyor	Yes	Mayor & Council
Stormwater engineer	Yes	Harold Pellow & Associates
Personnel skilled or trained in GIS applications	No	State
Local or state water quality professional	Yes	Harold Pellow & Associates
Scientist familiar with natural hazards in local area	No	State
Emergency manager	Yes	OEM
Watershed planner	No	-
Environmental specialist	No	-
Grant writers	No	-
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Construction Official
Other: Professionals trained in conducting damage assessments	Yes	Mayor & Council

Fiscal Capability

The table below summarizes financial resources available to the Borough of Branchville.

Table 9.4-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes

Financial Resource	Accessible or Eligible to Use?
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Branchville.

Table 9.4-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes- Clerk, Mayor, OEM
Do you have personnel skilled or trained in website development?	Yes- Clerk, Outside contractor
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes- if needed, flooding and hazard events can be added
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes- Borough newsletter

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Branchville.

Table 9.4-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	6/10	Not known
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of

local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.4-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Weak
Disease Outbreak	Weak
Drought	Strong
Earthquake	Weak
Flood	Moderate
Geologic	Weak
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Moderate
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.4-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Construction Services
Who is your floodplain administrator? (name, department/position)	Mike Robinson, Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	August 3, 2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements.
When was the most recent Community Assistance Visit or Community Assistance Contact?	None
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes

Criterion	Response
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA would consider attending training and/or continuing education training if offered in the County.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No. However, the Borough would attend a CRS seminar if offered locally.
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	4 policies
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	9 claims $57,589 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*

Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Borough of Branchville's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.4-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.4-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Although the County was impacted, the Borough did not report impact
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	The Borough was subject to municipal office closures and social distancing and masking requirements.

Source: FEMA 2020, NOAA NCEI 2020

9.4.5 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Borough of Branchville risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Branchville that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the

preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Branchville has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Branchville.

- Number of repetitive loss (RL) properties: 2
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.4-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
None identified			

Source: Sussex County Planning Partnership 2020

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The town hall and well house do not have adequate backup power to operate during a hazard event. The town hall is an essential facility that acts as the emergency operation center for the municipality, while the well house is critical for public utilities that are required to be fully operating at all times.
- The existing embarkments along Dry Brook are relatively low and are prone to overflow, causing potential widespread flooding to surrounding properties. In previous years, due to severe storms, the brook has flooded main roads entering and existing town, in addition to forcing hundreds of residents to evacuate.
- The municipality has previously experienced severe flooding in its brooks and streams that pass through the borough, including Dry Brook and Culvers Creek. In one year, the municipality experienced all in and outbound road closures due to stream flooding and a hundred residents forced to evacuate their homes as a result. The resulting debris from these types of events continue to be an issue to the municipality.
- There are 2 repetitive loss properties that are located in a 100-year flood zone.
- The Borough's Flood Damage Prevention Ordinance does not have any information in regard to freeboard.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the

economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Borough of Branchville ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Borough of Branchville. The Borough of Branchville has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Borough of Branchville assented to the proposed hazard ranking based on updated data. Dam failure, earthquake, and wildfire were reduced from "Medium" to "Low", and Hazardous Materials was reduced from "High" to "Medium".

Table 9.4-13. Borough of Branchville Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Low	Medium	Medium	Low	Medium	Medium

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.4.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.4-15 and Table 9.4-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.4-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Branchville-1 (old #3)	Raise embankments along 70 feet of the Dry Brook near Borough baseball field.	Borough Engineer	In progress	X	2021-Branchville-002
Branchville-2 (new)	Future rezoning procedures will recognize natural hazard areas that will allow greater intensity or density of use.	Borough Administration	Ongoing capability		
Branchville-3 (new)	Establish a community resilience committee and advisor.	Borough Administration	No Progress		

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Branchville-4 (new)	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Engineering via NFIP FPA with NJOEM, FEMA support	Ongoing capability		
Branchville-5 (revised old #6)	Provide information on all types of hazards, preparedness and mitigation measures, and responses on the Borough website.	Borough	Completed		

In addition to the above progress, the Borough of Branchville identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- None identified.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Branchville participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Branchville participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.4-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Branchville would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.4-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.4-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Branchville-001	Generator Installation	**Problem**: The town hall and well house do not have adequate backup power to operate during a hazard event. The town hall is an essential facility that acts as the emergency operation center for the municipality, while the well house is critical for public utilities that are required to be fully operating at all times. **Solution:** The town would like to install 3 phase multi-fuel source generators to power each respective facility. The borough engineer would need to conduct a needs assessment to determine the technical energy capacity needed before determining the proper generator needed for installation. The engineer would then be tasked to purchase and install the generator at each facility. The borough board shall assist as needed.	New	Severe Weather, Severe Winter Weather	1, 3, 5, 6	Borough Engineer	HMGP; BRIC	Continued operations	$200k	3 years	High	SIP	PP, ES
2021-Branchville-002	Dry Brook Embarkments	**Problem**: The existing embarkments along Dry Brook are relatively low and are prone to overflow, causing potential widespread flooding to surrounding properties. In previous years, due to severe storms, the brook has flooded main roads entering and existing town, in addition to forcing hundreds of residents to evacuate. **Solution:** The borough DPW and engineer will raise embankments along 70 feet of the Dry Brook near Borough baseball field. This will decrease flooding within the municipality and reduce overflow of creek during extreme weather events.	Existing	Flood	1, 2, 3, 5	Borough DPW/ Engineer	HMGP, BRIC	Reduced flooding along Dry Brook	Medium	3 years	High	SIP, NSP	SP, NR
2021-Branchville-003	Disaster Debris Management Plan	**Problem**: The municipality has previously experienced severe flooding in its brooks and streams that pass through the borough, including Dry Brook and Culvers Creek. In one year, the municipality experienced all in and outbound road closures due to stream	Existing	All Hazards	2, 3, 4, 5, 6	Borough Engineer & DPW	Borough Funds	Facilitate municipal recover from	Medium	1 year	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		flooding and a hundred residents forced to evacuate their homes as a result. The resulting debris from these types of events continue to be an issue to the municipality. **Solution:** Develop a disaster debris management plan that can be used to properly manage the debris after severe storms and flooding. Having specific guidance can help municipal and business owners determine what needs to be done with excess debris. The borough board shall lead the initiative to develop this plan, along with assistance from the DPW and engineer for technical guidance.						disaster.				
2021-Branchville-004	Outreach to repetitive flood properties	**Problem**: There are 2 repetitive loss properties that are located in a 100-year flood zone. **Solution:** Conduct outreach to the individual property owners and provide information on potential mitigation measures and or acquisition and relocation options.	Existing	Flood	1, 2, 3, 4, 5, 6, 7	Borough Planning	Municipal Budget, HMGP, FMA	Reduce potential for property loss due to flood	Low	5 years	High	EAP	PR, PP
2020-Branchville-005	Incorporate Freeboard into FDPO	**Problem:** The Borough's Flood Damage Prevention Ordinance does not have any information in regard to freeboard. **Solution:** The municipality will need to update its flood damage prevention ordinance using the model flood prevention ordinance from the State of New Jersey Department of Environmental Protection: https://www.nj.gov/dep/floodcontrol/modelord.htm	Existing	Flood	1, 2, 3, 4, 5, 6, 7	Borough Board	Municipal Budget	State Compliance	Low	1 year	High	LPR	PR

Notes:

Acronyms and Abbreviations: *Potential FEMA HMA Funding Sources:* *Timeline:*

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*
BRIC	*Building Resilient Infrastructure and Communities*
FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*

The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.4-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Branchville-001	Generator Installation	1	1	1	1	1	1	-1	0	0	1	1	1	1	0	9	High ⚠
2021-Branchville-002	Dry Brook Embarkments	1	1	1	0	1	1	-1	1	1	1	1	1	0	1	10	High
2021-Branchville-003	Disaster Debris Management Plan	1	1	1	0	1	1	0	1	1	0	1	1	1	1	11	High
2021-Branchville-004	Outreach to repetitive flood properties	1	1	1	1	1	1	1	1	1	0	0	0	0	1	10	High
2021-Branchville-005	Incorporate Freeboard into FDPO	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.4-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure					X			X
Disease Outbreak					X			X
Drought					X			X
Earthquake					X			X
Flood	X	X		X	X	X	X	X
Geologic					X			X
Hazardous Materials					X			X
Hurricane and Tropical Storm	X				X			X
Invasive Species					X			X
Nor'Easter					X			X
Severe Weather	X	X			X			X
Severe Winter Weather	X	X			X			X
Wildfire					X			X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.4-1. Borough of Branchville Hazard Area Extent and Location Map 1

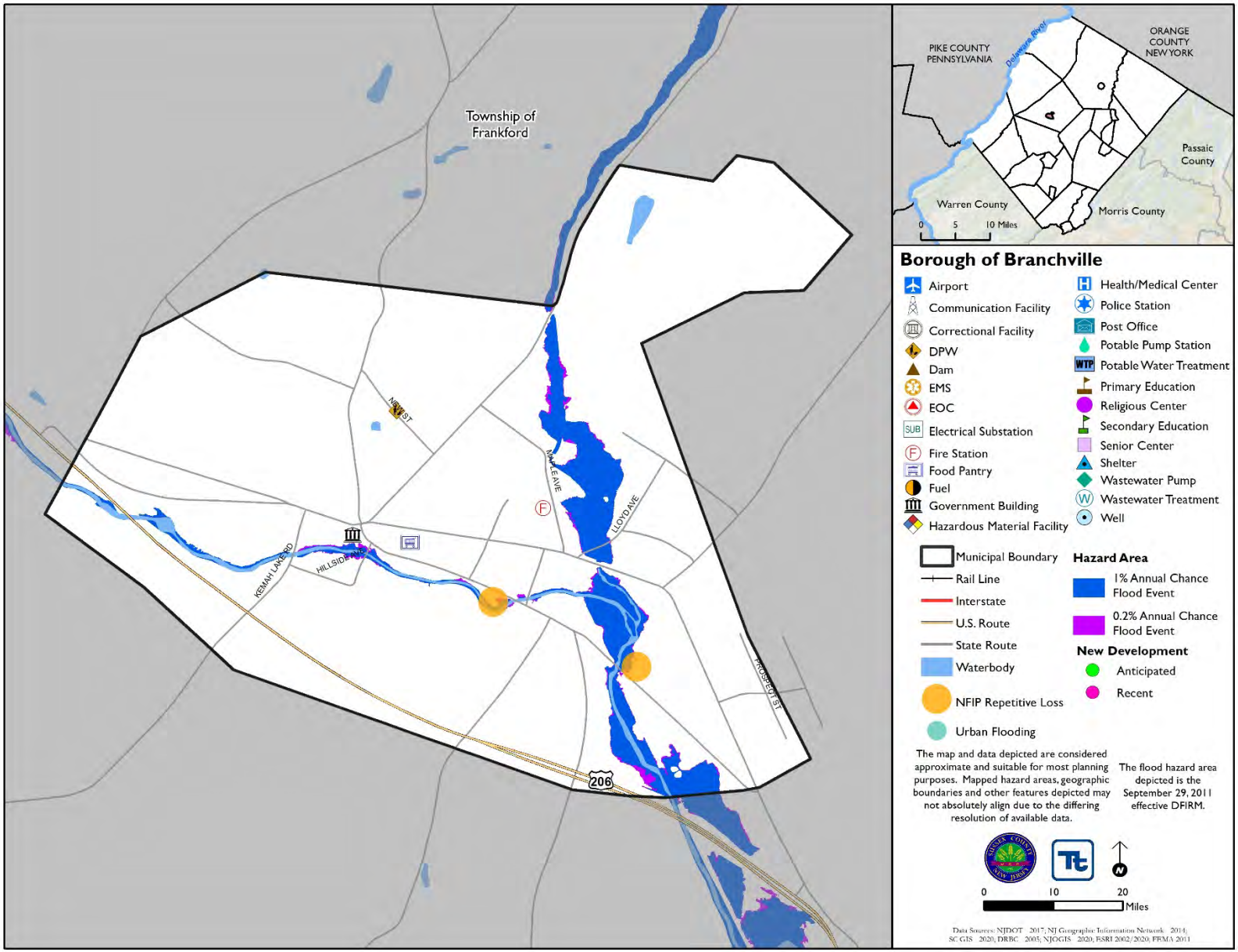


Figure 9.4-2. Borough of Branchville Hazard Area Extent and Location Map 2

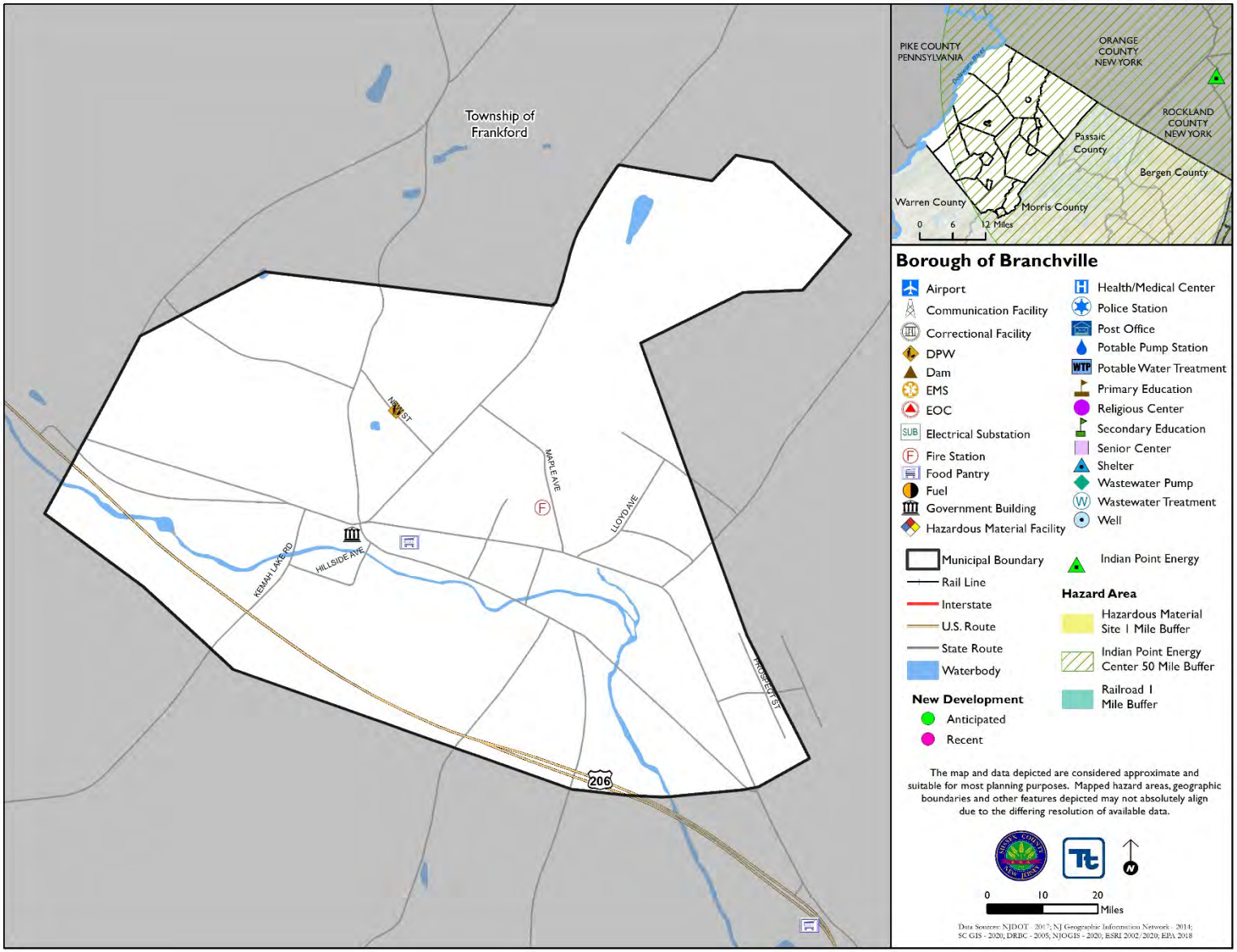
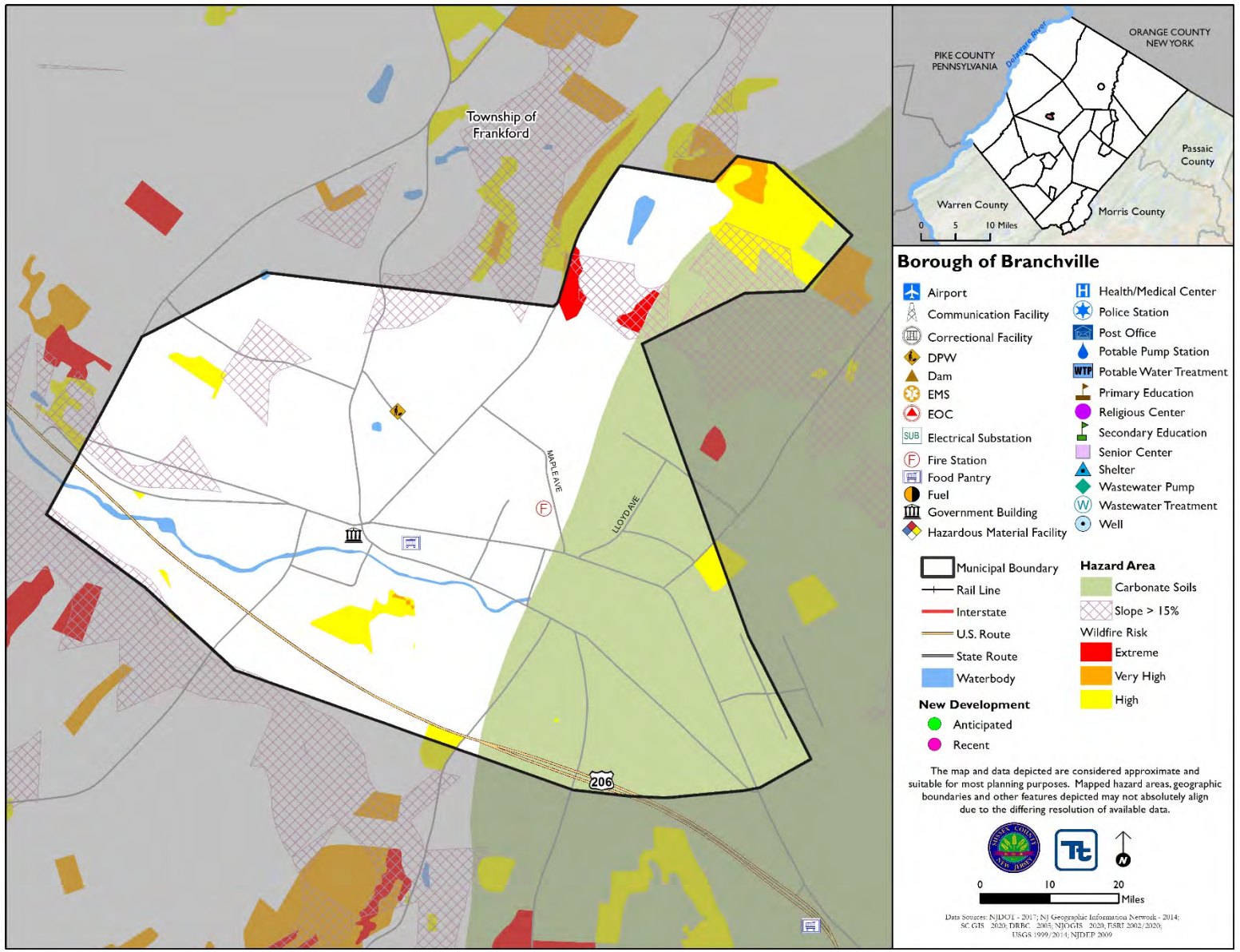


Figure 9.4-3. Borough of Branchville Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Generator Installation		
Project Number:	2021-Branchville-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Storm, Severe Winter Storm		
Description of the Problem:	The town hall and well house do not have adequate backup power to operate during a hazard event. The town hall is an essential facility that acts as the emergency operation center for the municipality, while the well house is critical for public utilities that are required to be fully operating at all times.		
Action or Project Intended for Implementation			
Description of the Solution:	The town would like to install 3 phase multi-fuel source generators to power each respective facility. The borough engineer would need to conduct a needs assessment to determine the technical energy capacity needed before determining the proper generator needed for installation. The engineer would then be tasked to purchase and install the generator at each facility. The borough board shall assist as needed.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	500-year flood	**Estimated Benefits (losses avoided):**	Continued operations
Useful Life:	20 years	**Goals Met:**	1, 3, 5, 6
Estimated Cost:	$100k for each	**Mitigation Action Type:**	Structural and Infrastructure Projects
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6 months once funding secured
Estimated Time Required for Project Implementation:	3 years	**Potential Funding Sources:**	HMGP; BRIC
Responsible Organization:	Borough Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	Develop backup office space/ new facility that has backup power	High	Staff would need to relocate during storm – not feasible
	Purchase solar power	High	Expensive and subject to weather
	Backup power source	Medium	Least expensive and continued operation

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Generator Installation	
Project Number:	2021-Branchville-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	The increases resilience of critical facility
Property Protection	1	The increases resilience of critical facility
Cost-Effectiveness	1	This project is cost effective
Technical	1	The municipality has the ability to determine generator needs
Political	1	There is no political opposition
Legal	1	There are no legal challenges
Fiscal	-1	The municipality needs funding
Environmental	0	There are no adverse impacts on the environment
Social	0	This has no negative social impact
Administrative	1	
Multi-Hazard	1	This addresses multiple hazards
Timeline	1	The project is feasible within the given timeframe
Agency Champion	1	Borough Engineer
Other Community Objectives	0	None at this time
Total	9	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Dry Brook Embarkments		
Project Number:	2021-Branchville-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	The existing embarkments along Dry Brook are relatively low and are prone to overflow, causing potential widespread flooding to surrounding properties. In previous years, due to severe storms, the brook has flooded main roads entering and existing town, in addition to forcing hundreds of residents to evacuate.		
Action or Project Intended for Implementation			
Description of the Solution:	The borough DPW and engineer will raise embankments along 70 feet of the Dry Brook near Borough baseball field. This will decrease flooding within the municipality and reduce overflow of creek during extreme weather events.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	500-year storm	**Estimated Benefits (losses avoided):**	Reduced flood loss
Useful Life:	30 years	**Goals Met:**	1, 2, 3, 5
Estimated Cost:	Medium	**Mitigation Action Type:**	Structural and Infrastructure Projects/ Natural System Protection
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6 months once funding secured
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC
Responsible Organization:	Borough Engineer, DPW	**Local Planning Mechanisms to be Used in Implementation if any:**	Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	Raise all roads to prevent future flooding	High	Cost too high and unreasonable
	Bury Dry Creek	High	Cost too high and unreasonable
	Increase embarkment height	Low-Medium	Best solution

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Dry Brook Embarkments	
Project Number:	2021-Branchville-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	The increases resilience of critical facility
Property Protection	1	The increases resilience of critical facility
Cost-Effectiveness	1	This project is cost effective
Technical	0	The municipality has the ability to design solution
Political	1	
Legal	1	
Fiscal	-1	The municipality needs funding
Environmental	1	There are no adverse impacts on the environment
Social	1	This has no negative social impact
Administrative	1	
Multi-Hazard	1	This addresses multiple hazards
Timeline	1	The project is feasible within the given timeframe
Agency Champion	0	Borough Engineer, DPW
Other Community Objectives	1	None at this time
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Disaster Debris Management Plan		
Project Number:	2021-Branchville-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Storm, Severe Winter Storm, Flood, Hurricane and Tropical Storm		
Description of the Problem:	The municipality has previously experienced severe flooding in its brooks and streams that pass through the borough, including Dry Brook and Culvers Creek. In one year, the municipality experienced all in and outbound road closures due to stream flooding and a hundred residents forced to evacuate their homes as a result. The resulting debris from these types of events continue to be an issue to the municipality.		
Action or Project Intended for Implementation			
Description of the Solution:	Develop a disaster debris management plan that can be used to properly manage the debris after severe storms and flooding. Having specific guidance can help municipal and business owners determine what needs to be done with excess debris. The borough board shall lead the initiative to develop this plan, along with assistance from the DPW and engineer for technical guidance.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	500-year storm	**Estimated Benefits (losses avoided):**	Better recovery after disaster
Useful Life:	5 years	**Goals Met:**	2, 3, 4, 5, 6
Estimated Cost:	$100k	**Mitigation Action Type:**	Local Plans and Regulations
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6 months once funding secured
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	Borough funds
Responsible Organization:	Borough Board	**Local Planning Mechanisms to be Used in Implementation if any:**	Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No plan	Medium	Lack of coordination for cleanup
	Incorporate into municipal trash cleanup	High	Not feasible
	Develop debris management plan	Medium	Best alternative

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Disaster Debris Management Plan	
Project Number:	2021-Branchville-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	The increases resilience of critical facility
Property Protection	1	The increases resilience of critical facility
Cost-Effectiveness	1	This project is cost effective
Technical	0	The borough board would administer this project with the DPW
Political	1	
Legal	1	
Fiscal	0	The municipality needs funding
Environmental	1	There are no adverse impacts on the environment
Social	1	This has no negative social impact
Administrative	0	No admin determined at this time
Multi-Hazard	1	This addresses multiple hazards
Timeline	1	The project is feasible within the given timeframe
Agency Champion	1	Borough
Other Community Objectives	1	None at this time
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Outreach to repetitive flood properties		
Project Number:	2021- Branchville-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	There are 2 repetitive loss properties that are located in a 100-year flood zone.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to the individual property owners and provide information on potential mitigation measures and or acquisition and relocation options.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No X	
Level of Protection:	500-year storm	**Estimated Benefits (losses avoided):**	Flood Damage Prevention
Useful Life:	NA	**Goals Met:**	1, 2, 3, 4, 5, 6, 7
Estimated Cost:	Low	**Mitigation Action Type:**	Education and Awareness Programs
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6 months once funding secured
Estimated Time Required for Project Implementation:	5 years	**Potential Funding Sources:**	Borough funds, FMA, HMGP
Responsible Organization:	Borough Planning	**Local Planning Mechanisms to be Used in Implementation if any:**	Mitigation
Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No plan	Medium	Lack of coordination for cleanup
	Purchase new housing for affected residents	Medium	Relatively higher costs and resident less willing to relocate
	Relocation	Medium	Best solution
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Action Worksheet		
Project Name:	Outreach to repetitive flood properties	
Project Number:	2021- Branchville-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	The increases resilience of critical facility
Property Protection	1	The increases resilience of critical facility
Cost-Effectiveness	1	This project is cost effective
Technical	1	The borough board would administer this project
Political	1	To be determined
Legal	1	To be determined
Fiscal	1	The municipality needs funding
Environmental	1	There are no adverse impacts on the environment
Social	1	This has no negative social impact
Administrative	0	
Multi-Hazard	0	Flood
Timeline	0	
Agency Champion	0	Borough Planning
Other Community Objectives	1	None at this time
Total	10	
Priority (High/Med/Low)	High	

9.5 TOWNSHIP OF BYRAM

This section presents the jurisdictional annex for the Township of Byram. The annex includes a general overview of the Township of Byram; an assessment of the Township of Byram's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.5.1 Hazard Mitigation Planning Team

The Township of Byram followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.5-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Joseph Sabatini, Township Manager Address: 10 Mansfield Drive, Stanhope, NJ 07874 Phone Number: (973) 347-2500 ext 129 Email: jsabatini@byramtwp.org	Name / Title: Alex Rubenstein, Mayor Address: 10 Mansfield Drive, Stanhope, NJ 07874 Phone Number: (862) 268-0288 Email: arubenstein@byramtwp.org
NFIP Floodplain Administrator	
Name / Title: Peter Karcher, Construction Official Address: 10 Mansfield Drive, Stanhope, NJ 07874 Phone Number: (908) 416-1126 Email: pkarcher@byramtwp.org	

Name	Title	Method of Participation
Joseph Sabatini	Township Manager	Primary point of contact
Alex Rubenstein	Mayor	Alternate point of contact
Peter Karcher	Construction Official	NFIP Floodplain Administrator
Thomas Koundry	Emergency Management Coordinator	Provided data and information, contributed to the mitigation strategy
Phillip Crosson	Byram Township Deputy Manager	Provided data and information, contributed to the mitigation strategy

9.5.2 Jurisdiction Profile

Byram Township is located in southern Sussex County. The Township is bordered to the north by the Townships of Andover and Sparta, to the east by the Borough of Hopatcong, to the west by Green and Andover Townships and to the south by Stanhope and Warren County. Numerous unincorporated communities are found within the Township and include: Roseville, Whitehall, Cranberry Lake, Waterloo, and Lockwood. Andover Junction Brook, Musconetcong River, and Lubbers Run all flow through the Township. The Township is known as "The Township of Lakes" because of the two dozen lakes and ponds located throughout. Byram covers more than 22.48 square miles. Additionally, the Township is located within the New Jersey Highlands Region.

According to the U.S. Census, the 2010 population for the Township of Byram was 8,350. The estimated 2018 population was 8,010, a 4.1 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 4.7 percent of the population is 5 years of age or younger and 13.7 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.5.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.5-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.5-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	1	0	0	0	2	0	0	0	2	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	8	0	3	0	3	0	1	0	3	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
Quick Check	Commercial	2	Block 41 Lot 89	Nuclear Incident Hazard Area	Completed
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
WaWa	Commercial	2	75 Route 206 South	Nuclear Incident Hazard Area	Approved by Planning Board on 1/28/2021
Anty Trucking & Rigging	Commercial	1	9 Lackawana Drive	Nuclear Incident Hazard Area, Hazardous Material Incident Hazard Area	Planning stages

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.5.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Byram performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities

- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Byram identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Byram and where hazard mitigation has been integrated.

Table 9.5-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *This code complies with State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Planning Board and Township Council are responsible for this code in compliance with Chapter 240: Zoning.* • *The code complies with Municipal Ord. Chapter 240 (4/5/79) and various amendments.* • *The ordinance includes provisions to secure safety from fire, flood, panic and other natural and man-made disasters, provide sufficient space in appropriate locations for a variety of agricultural, residential, recreational, commercial and industrial uses and open spaces, both public and private, according to their respective environmental requirements in order to meet the needs of all New Jersey citizens, and promote the conservation of historic sites and districts, open space, energy resources and valuable natural resources in the state and to prevent urban sprawl and degradation of the environment through improper use of land.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. • *The Planning Board and Township Council are responsible for this code in compliance with Chapter 240: Zoning.* • *The code complies with Municipal Ord. Chapter 215 (4/5/79) and various amendments.*					
Stormwater Management	Yes	State & Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The Township Council and NJDEP are responsible for this ordinance in compliance with Chapter 211: Stormwater Control; Tier 1 Stormwater Permit (annual).* • *This ordinance complies with Municipal Ord. Chapter 211 (4/3/06) and annual NJDEP Tier 1 Stormwater Permit.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	No	-
Comment: • *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	State & Local	Yes – if municipality has a Planning Board	No	-
Comment: • *These ordinances have been updated from 2002 to present.* • *The Planning Board, Township Council, and Highlands Council are responsible for these ordinances in compliance with 2002 Township Smart Growth Plan; 2004 Township Master Plan; 2006 zoning ordinances based on 2004 Township Master Plan; Master Plan Highlands Element 10/12/14; full Highlands Conformance now underway.* • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Planning Board and Township Council are responsible for these requirements in compliance with Chapter 215: Subdivision and Site Plan.* • *These requirements comply with Municipal Ord. Chapter 215 (4/5/79) and various amendments.*					
Environmental Protection	Yes	State & Local	No	Yes	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *Governed by DEP and Local Ordinances* o *Chapter 19 Environmental Commission* o *Chapter 167 Littering and Dumping* o *Chapter 169 Hazardous Materials* o *Chapter 208 Soil Removal*					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	2021-Byram-008
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *This ordinance follows Township Ord. Chapt.135: Flood Damage Prevention.* • *It is the purpose of this chapter to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:* o *A. Protect human life and health;* o *B. Minimize expenditure of public money for costly flood-control projects;* o *C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* o *D. Minimize prolonged business interruptions;* o *E. Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard;* o *F. Help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;* o *G. Ensure that potential buyers are notified that property is in an area of special flood hazard; and* o *H. Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.* • *The ordinance currently lacks the state's 1-foot freeboard requirement.*					
Wellhead Protection	Yes	Local	No	Yes	-
Comment: • *The Zoning Ordinance includes an article on Highlands Area Land Use which discusses wellhead protection areas.*					
Emergency Management	Yes	State/Local	No	Yes	-
Comment: • *Chapter 32 Emergency Management*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Municipal Separate Storm Sewer System (MS4)	Yes	Local	No	Yes	
Comment: • *The Township Council is responsible for this ordinance in compliance with Chapter 203: Separate Storm Sewer System and Municipal Ord. Chapter 203 (12/19/05).*					
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Yes	Local	No	Yes	
Comment: • *The Planning Board and Township Council are responsible for these ordinances in compliance with Ord. 240-29.2: Tract Disturbance; also Master Plan Highlands Element (10/2/14) and full Highlands Conformance (now underway). These ordinances were amended on November 15, 2004.*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *This plan was adopted on December 16, 2004.It was re-examined in March of 2012.* • *The Planning Board is responsible for this plan in compliance with Byram Twp. Master Plan 2004; Master Plan Re-examination Report 2012.*					
Capital Improvement Plan	Yes	Local	No	Yes	-
Comment: *The Township Council is responsible for this plan in compliance with 2015 Municipal Budget—3-yr. Plan.*					
Disaster Debris Management Plan	No	-	No	-	2021-Byram-007
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The Township Council is responsible for this plan in compliance with Municipal Stormwater Mgt. Plan (Sept.2005); Ordinance Chapter 211, Stormwater Control.* • *This plan was adopted on April 3, 2006 according to Municipal Ordinance 211.*					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	Yes	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	Yes	Local	No	Yes	-
Comment:					
Community Forest Management Plan	Yes	Local	No	Yes	-
Comment:					
Transportation Plan	Yes	Local	No	Yes	
Comment: • *The Planning Board is responsible for this plan in compliance with Master Plan Circulation Element 2004.*					
Agriculture Plan	Yes	County	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	Yes	Local	No	Yes	-
Comment: • Eco Tourism Plan is incorporated as part of the Open Space Recreation Plan.					
Business Development Plan	Yes	Local	No	No	-
Comment:					
Other: Open Space Plan	Yes	Local	No	Yes	-
Comment: • *This plan was adopted in October of 2000 and was updated in November of 2010.* • *The Township Open Space Committee is responsible for this plan in compliance with Open Space and Recreation Plan (2000) and OS and Recreation Plan Update (2010).*					
Other: Stream Corridor Management Plan	Yes	Local	No	Yes	-
Comment: • *This plan was adopted in June of 1997 and updated on December 18, 2000.* • *The Township Environmental Commission is responsible for this plan in compliance with Lubbers Run Greenway Project: A Stream Corridor Study (1997 and 2000).*					
Watershed Management or Protection Plan	Yes	State & Local	Yes	Yes	-
Comment: • *The Planning Board and Council are responsible for this plan in compliance with Lakefront Development Plan 2003; Highlands Conformance Process (underway).*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *The Township Council and Emergency Management Coordinator are responsible for this plan in compliance with Municipal Ordinance Chapter 32: Emergency Management and the 2015 EOP update.* • *This plan was adopted on October 2, 1974 and amended on November 19, 1990 according to Municipal Ordinance Chapter 32. The plan was then updated in 2019*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	Local	No	Yes	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	Yes	Local	No	Yes	-
Comment: • Township Policies are in place for continuity of operations					
Public Health Plan	Yes	County	Yes	Yes	-
Comment: • *The Public Health plan is administered by Sussex County Health Department.*					
Other Plans: Smart Growth Plan 2002	Yes	Local	No	Yes	-
Comment: • *The Planning Board is responsible for these plans in compliance with Byram Township Smart Growth Plan (2002).*					

Table 9.5-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Building Department
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Byram.

Table 9.5-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Municipal Ordinance Chapter 45: 1/19/77, 11/19/90; Amendment 5/4/95
Mitigation Planning Committee	Yes	Hazard Mitigation Planning Team: Township Council and Municipal Department Heads
Environmental Board / Commission	Yes	Municipal Ordinance Chapter 19 (10/2/74)
Open Space Board / Committee	Yes	Municipal Ordinance Chapter 42 (1/20/2000)
Economic Development Commission / Committee	Yes	Municipal Ordinance Chapter 16 (10/21/85)
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Nixle, various Social media platforms
Maintenance program to reduce risk	Yes	Superintendent of Department of Public Works
Mutual aid agreements	Yes	Lakeland Emergency Squad & Byram Township Fire Department

Staff/Personnel Resource	Available?	Department/Agency/Position
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Municipal and Planning Board Engineer; Consulting Land Use Planner
Engineers or professionals trained in building or infrastructure construction practices	Yes	Construction Official and Sub-Code Officials
Planners or engineers with an understanding of natural hazards	Yes	Construction Official and Sub-Code Officials
Staff with training in benefit/cost analysis	Yes	Township Manager; Township Engineer, Township Risk Manager
Staff with training in green infrastructure	Yes	Construction Official and Sub-Code Officials
Staff with education/knowledge/training in low impact development	Yes	Construction Official
Surveyor	Yes	Within Office of Township Engineer.
Stormwater engineer	Yes	Cory Stoner – Harold E. Pellow & associates
Personnel skilled or trained in GIS applications	Yes	Municipal/Planning Board Engineer
Local or state water quality professional	Yes	Sussex County Water Quality Board
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Emergency Management Coordinator
Watershed planner	No	-
Environmental specialist	Yes	Environmental Commission – Forester is Gracie & Harrigan Consulting Foresters
Grant writers	Yes	Municipal Staff
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Construction Official
Other: Professionals trained in conducting damage assessments	Yes	Construction Official, Municipal Engineer

Fiscal Capability

The table below summarizes financial resources available to the Township of Byram.

Table 9.5-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital Improvements Project Funding	Yes, Township Council
Authority to Levy Taxes for Specific Purposes	Yes, Township Council
User Fees for Water, Sewer, Gas or Electric Service	Yes (sewer fees), Township Council
Incur Debt through General Obligation Bonds	Yes, Township Council
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	Yes, Township Planning Board and Council.
State-Sponsored Grant Programs	Yes, Township Council.
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other: Open Space Acquisition Funding Programs	Yes, Township Council and Open Space Committee

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Byram.

Table 9.5-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes, Township Manager
Do you have personnel skilled or trained in website development?	No
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	No

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Byram.

Table 9.5-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	3 – 1 and 2 family residential properties 3 – commercial and industrial properties	2009
Public Protection (Fire ISO Protection Class)	Yes	Class 06/6X	June 2014
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Not certified	Joined program 5/4/2009

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.5-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Weak
Earthquake	Weak
Flood	Moderate

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Geologic	Unsure
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Moderate
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

The Township does not have access to resources to determine the possible impacts of climate change upon the municipality and is not currently supportive of integrating climate change in policies or actions? No

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.5-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Construction Official/Building Department
Who is your floodplain administrator? (name, department/position)	Peter Karcher, Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	Construction Official/Building Department
What is the date that your flood damage prevention ordinance was last amended?	August 2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements.
When was the most recent Community Assistance Visit or Community Assistance Contact?	January 12, 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	YES – FEMA maps
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	Other than the lack of a general education/outreach program regarding flood hazards and risk, the Township lacks funding and resources to conduct a broader floodplain management program. The Township would welcome any opportunities to improve training and support for the FPA and Township

Criterion	Response
	staff to identify and mitigate floodprone areas.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No. However, the Township has considered joining CRS and would attend a CRS seminar if offered locally.
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	22 policies $5,666,800 insurance in force $20,214 premium in force
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	14 claims $129,878 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

Opportunities for Future Integration

- **Flood Damage Prevention Ordinance:** The Township will update the Flood Damage Prevention Ordinance to include the state mandated freeboard requirement. (2021-Byram-008)
- **Disaster Debris Management Plan**: The Township will develop a Disaster Debris Management Plan. (2021-Byram007)

9.5.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Byram's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.5-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.5-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Although the County was impacted, the Township did not report major impacts.
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	The Township was subject to temporary closures and social distancing and masking mandates.

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
August 4, 2020	4574DR Tropical Storm Isaias	Yes	A Major tropical storm produced high, damaging winds and significant rainfall	The Township was subject to numerous downed trees and power lines. Equipment damage was also experienced.

Source: FEMA 2020, NOAA NCEI 2020

9.5.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Byram risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Byram that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Byram has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Byram.

- Number of repetitive loss (RL) properties: 3
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.5-12. Critical Facilities and Lifelines Flood Exposure

[redacted]

Name	

Hazardous Materials

2016 Action Number Action Description		

funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as High, Medium, or Low. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.5-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Initiative Number

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*

Potential FEMA HMA Funding Sources:

Table 9.5-16. Summary of Evaluation and Action Priorities

Table 9.5-17. Analysis of Mitigation Actions by Hazard and Category

Figure 9.5-1. Township of Byram Hazard Area Extent and Location Map 1

Figure 9.5-2. Township of Byram Hazard Area Extent and Location Map 2

Figure 9.5-3 Township of Byram Hazard Area Extent and Location Map 3

Action Worksheet	
Project Name:	East Brookwood Alternative Emergency Ingress/Egress

Action Worksheet	
Project Name	East Brookwood Estates Drainage

Action Worksheet	
Project Name:	East Brookwood Estates Drainage

Action Worksheet	
Project Name	Upgrade and Improve Culverts on Little Point Way

Action Worksheet	
Project Name:	Upgrade and Improve Culverts on Little Paint Way

Action Worksheet	
Project Name	Repetitive Loss Mitigation

9.6 TOWNSHIP OF FRANKFORD

This section presents the jurisdictional annex for the Township of Frankford. The annex includes a general overview of the Township of Frankford; an assessment of the Township of Frankford's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.6.1 Hazard Mitigation Planning Team

The Township of Frankford followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.6-1. Hazard Mitigation Planning Team

Primary Point of Contact		Alternate Point of Contact
Name / Title: Jeff Lewis, OEM Coordinator Address: Frankford Township Municipal Building 151 US Highway 206, Augusta NJ 07822 Phone Number: 973-479-7203 Email: jlewis310@embarqmail.com		Name / Title: Scott Klosterhoff, OEM Deputy Coordinator Address: Frankford Township Municipal Building 151 US Highway 206, Augusta NJ 07822 Phone Number: 973-534-7699 Email: klosterhoffconstruction@gmail.com
NFIP Floodplain Administrator		
Name / Title: Harold Pellow, Engineer Address: 17 Plains Road, Augusta, NJ 07822 Phone Number: (973) 948-6463 Email: hpellow@hpellow.com		
Name	**Title**	**Method of Participation**
Jeff Lewis	OEM Coordinator	Primary point of contact; attended the annex training, risk assessment meeting and mitigation strategy workshop; provided data and updated information for the annex.
Scott Klosterhoff	OEM Deputy Coordinator	Alternate point of contact

9.6.2 Jurisdiction Profile

Frankford Township is geographically located in the center of Sussex County. It encompasses 34.8 square miles and contains two natural lakes, Culver Lake and Lake Owassa, and the Kittatinny Mountains. The Township is bordered to the north by Montague Township, to the northeast by the Township of Wantage, to the east by Lafayette Township, to the south by Hampton Township and to the west by the Townships of Sandyston and Walpack. Papakating Creek, Dry Brook, Paulins Kill, and Culvers Creek all flow throughout the Township. The following unincorporated communities are located within the Township: Culvers Inlet, Mount Pisgah, Augusta, Ross' Corner, Northrup, Plains, Armstrong, Pelletown, and Wykertown.

According to the U.S. Census, the 2010 population for the Township of Frankford was 5,565. The estimated 2018 population was 5,361, a 3.6 percent decrease from the 2010 Census. Data from the 2018 U.S. Census

American Community Survey indicate that 3.2 percent of the population is 5 years of age or younger and 20.1 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.6.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.5-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.6-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units										
Multi-Family										
Other (commercial, mixed-use, etc.)										
Property or Development Name	**Type of Development**		**# of Units / Structures**		**Location** (address and/or block and lot)		**Known Hazard Zone(s)***		**Description / Status of Development**	
Recent Major Development and Infrastructure from 2015 to Present										
Not available to date										
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years										
Not available to date										

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.6.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Frankford performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Frankford identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Frankford and where hazard mitigation has been integrated.

Table 9.6-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Building Department is responsible for this code in compliance with State Uniform Construction Code Act, (N.J.S. 52:27D-119 et seq.,), and Chapter 7 – Building and Housing.*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Land Use Board and Zoning Department are responsible for this code in compliance with Chapter 30, Article 10 – Land Use/Zoning.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Land Use Board is responsible for this ordinance in compliance with Chapter 15- Land Subdivision.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *This ordinance follows Chapter 32 of municipal code.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	Yes – if municipality has a Planning Board	-	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	County & Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.*					
Environmental Protection	Yes	Local	No	Yes	-
Comment: • *Chapter 20 Environmental Protection* o *This section provides for the replacement or reimbursement of the specialized and sometimes nonreusable equipment required by State and Federal regulations to be made available in the Township in case of fire, leakage or spillage involving any hazardous material.* o *This section entitles the Township of Frankford to reimbursement for any expendable items used by the Township or any of its agencies in extinguishing any fire, stopping or containing any leak or controlling any spill of hazardous materials.* • *Chapter BH9 Litter Control*					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	2021-Frankford-003
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Engineering Department is responsible for this ordinance in compliance with Chapter 27 – Flood Damage Prevention.* • *It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:* o *a. Protect human life and health;* o *b. Minimize expenditure of public money for costly flood control projects;* o *c. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
o *d. Minimize prolonged business interruptions;* o *e. Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, bridges located in areas of special flood hazard;* o *f. Help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;* o *g. Ensure that potential buyers are notified that property is in an area of special flood hazard; and* o *h. Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.* • *The Flood Damage Prevention Ordinance was adopted in 2011 and does not include the state mandated freeboard requirement.*					
Wellhead Protection	Yes	Local	No	Yes	-
Comment: • *Chapter 30-617 Aquifer and Wellhead Protection was adopted to provide the Township with guidelines for an aquifer protection and aquifer/well testing ordinance to determine adequate groundwater supply for residential and commercial development in areas not served by public water supply.*					
Emergency Management	Yes	Local	No	No	-
Comment: • *Chapter 3 Police Regulations* • *Chapter 14 Fire Protection and Prevention*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	No	-	No	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	No	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Land Use Board is responsible for this plan. This plan was adopted in 2004 with periodic updates.*					
Capital Improvement Plan	Yes	Local	No	No	-
Comment: *The Engineering Department is responsible for this plan, which is updated annually.*					
Disaster Debris Management Plan	No	State & Local	Yes	Yes	2021-Frankford-002
Comment:					
Floodplain or Watershed Plan	Yes	Local	No	Yes	-
Comment: *The Engineering Department is responsible for this plan.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Stormwater Management Plan	Yes	State & Local	Yes	-	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.*					
Stormwater Pollution Prevention Plan	Yes	State & Local	Yes	-	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	Yes	County	No	-	-
Comment: *The Economic Development Partnership is responsible for this plan.*					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other: Open Space Plan	Yes	Local	No	No	-
Comment: • *The Open Space Commission is responsible for this plan, which was updated I 2016 has a part of the Master Plan.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Office of Emergency Management is responsible for this plan.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	County & Local	No	-	-
Comment: County Function					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	Yes	County and Local	No	-	-
Comment:					
Public Health Plan	Yes	County and Local	No	-	-
Comment: Part of ESF; Deputy Clerk works with Board of Health					
Other	No	-	No	-	-
Comment:					

Table 9.6-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes
Does your jurisdiction have the ability to track permits by hazard area?	Yes/No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes The Township completed a Buildable Lands Inventory as part of its affordable housing planning initiative.

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Frankford.

Table 9.6-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board

Staff/Personnel Resource	Available?	Department/Agency/Position
Mitigation Planning Committee	No	-
Environmental Board / Commission	No	-
Open Space Board / Committee	Yes	Open Space Board; Parks Commission
Economic Development Commission / Committee	Yes	Economic Development Committee
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Swift Water Reach 9-1-1 (through County)
Maintenance program to reduce risk	Yes	Department of Public Works
Mutual aid agreements	Yes	Rescue Squad, Volunteer Fire Department with surrounding communities in conjunction with County
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Professional services agreement with Engineer
Engineers or professionals trained in building or infrastructure construction practices	Yes	Professional services agreement with Engineer
Planners or engineers with an understanding of natural hazards	Yes	Professional services agreement with Engineer
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes	Harold Pellow & Associates
Staff with education/knowledge/training in low impact development	Yes	Harold Pellow & Associates
Surveyor	Yes	Mayor & Council
Stormwater engineer	Yes	Harold Pellow & Associates
Personnel skilled or trained in GIS applications	No	State
Local or state water quality professional	Yes	Harold Pellow & Associates
Scientist familiar with natural hazards in local area	No	State
Emergency manager	Yes	OEM
Watershed planner	No	-
Environmental specialist	No	-
Grant writers	No	-
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Township Engineer per municipal code
Other: Professionals trained in conducting damage assessments	Yes	???

Fiscal Capability

The table below summarizes financial resources available to the Township of Frankford.

Table 9.6-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No

Financial Resource	Accessible or Eligible to Use?
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	No
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes/No
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Frankford.

Table 9.6-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes/No
Do you have personnel skilled or trained in website development?	Yes/No
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes/No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	Yes/No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	Yes/No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes/No

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Frankford.

Table 9.6-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	No	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.6-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Weak
Disease Outbreak	Weak
Drought	Moderate
Earthquake	Weak
Flood	Strong
Geologic	Weak
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Moderate
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.6-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering
Who is your floodplain administrator? (name, department/position)	Harold Pellow, Engineer
Are any certified floodplain managers on staff in your jurisdiction?	???
What is the date that your flood damage prevention ordinance was last amended?	???
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements set by FEMA and the State.
When was the most recent Community Assistance Visit or Community Assistance Contact?	September 7, 2010
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	???
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	???
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	???
Does your jurisdiction participate in the Community Rating System (CRS)?	No

Criterion	Response
-If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	20 policies
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	11 claims $61,459 in payments
Do you maintain a list of properties that have been damaged by flooding?	???
Do you maintain a list of property owners interested in flood mitigation?	???

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

9.6.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Frankford's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.5-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.6-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	No damages identified.
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	The Township was subject to municipal office closures and social distancing and masking requirements.

Source: FEMA 2020, NOAA NCEI 2020

9.6.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Frankford risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Frankford that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards

that can be clearly identified using mapping techniques and technologies and for which the Township of Frankford has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Frankford.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019

Critical Facilities

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.6-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
Main Library	Shelter	X	X
21-3 Culvers Lake Dam	Dam	X	X
22-8 Stinson Pond Dam	Dam	X	X
22-14 No Name #42 Dam	Dam	X	X
22-127 Sussex County Farm Dam	Dam	X	X

Source: Sussex County Planning Partnership 2020
Note:
**Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The Flood Damage Prevention Ordinance requires update to include freeboard.
- Drainage issues are experienced in the in Culver Lake area. The Township is replacing tiles with plastic piping.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Frankford ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Frankford. The Township of Frankford has reviewed the Sussex County hazard ranking table and has

provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Frankford agreed with the calculated hazard rankings.

Table 9.6-13. Township of Frankford Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Low	Medium	Medium	Low	Medium	Medium

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.6.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.5-15 and Table 9.5-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.6-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Frankford-1 (old #1 and 4)	Ensure continuity of operations. Purchase and install generators for critical facilities in the Township: • Fire Department – Stations 1 & 2 Municipal Building	Township	Complete		
Frankford-2 (new)	Incorporate risk assessment and hazard mitigation principles into comprehensive planning efforts.	Township	Ongoing Capability		
Frankford-3 (new)	Conduct an engineering study to identify the flooding issues on Culvers Lake and Union Turnpike. Once study is completed, identify mitigation strategies to correct this issue.	Engineering	Ongoing Capability		
Frankford-4 (new)	Upgrading of culverts on Ridge Road and Plains Road. This area tends to accumulate water during heavy rain events.	DPW, Engineering			

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Frankford-5 (revised old #6 and 9)	Continue to develop and enhance the Township's public outreach and education program on mitigation related issues. Provide information on all types of hazards, preparedness and mitigation measures, and responses on the Township website.	Township, OEM	Ongoing Capability		
Frankford-6 (old #8)	Install a storm warning system on the firehouse located on Route 206 once it is constructed.	Township OEM, Fire Department	No Progress		

In addition to the above progress, the Township of Frankford identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- List any other mitigation projects you completed that were not identified in the 2016 plan
-

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Frankford participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Frankford participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.5-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Frankford would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.5-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.6-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Frankford-001	Dam Inspection and Outreach	**Problem**: There are a number of dams in Frankford that are located in flood zones, provide recreational uses, and downstream flood protection. The structural conditions of these dams needs to be assessed for safety, with findings reported to the Township. **Solution:** The Township will undertake	Existing	Dam Failure; Flood; Hurricane/ Tropical Storm; Nor'Easter; Severe Storm; Severe Winter Storm	3, 5, 6	NJDEP; Township OEM; Private owners	Staff Time	Enhanced safety and technical capabilities	Staff Time	Within 3 years	High	LPR	PR
2021-Frankford-002	Disaster Debris Management Plan	**Problem:** The Township currently does not have an adopted debris management plan. Without a plan in place, there are no identified resources in place to properly address debris and do not have identified locations for debris storage. **Solution:** The Township will develop a debris management plan that will assist the municipality when they need to facilitate response and recovery after a debris-causing incident. The plan will provide direction to facilitate and coordinate the management of debris following a disaster.	Existing	Flood, Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather, Wildfire	3, 5, 6	OEM, Public Works	Township budget	Increased disaster capability and preparedness	Staff time	1 year	High	LPR	ES
2021-Frankford-003	Flood Damage Prevention Ordinance Update	**Problem:** The Township's Flood Damage Prevention Ordinance lacks language to include the state mandated freeboard requirement. **Solution:** The Township will update the Flood Damage Prevention Ordinance to include the state mandated freeboard requirement.	New	Flood	2	Administration	Borough budget	Meet state standards	Staff time	Within 6 months	High	LPR	PR

Notes:

Acronyms and Abbreviations:
CAV Community Assistance Visit
CRS Community Rating System
DPW Department of Public Works

Potential FEMA HMA Funding Sources:
BRIC Building Resilient Infrastructure and Communities
FMA Flood Mitigation Assistance Grant Program
HMGP Hazard Mitigation Grant Program

Timeline:
The time required for completion of the project upon implementation

Cost:

FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.6-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Frankford-001	Dam Inspection and Outreach	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High ⚠
2021-Frankford-002	Disaster Debris Management Plan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-Frankford-003	Flood Damage Prevention Ordinance Update	0	1	1	1	1	1	1	1	1	1	0	1	1	1	12	High

Notes: *Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.*
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.6-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure	X							X
Disease Outbreak								
Drought								
Earthquake								
Flood	X						X	X
Geologic								
Hazardous Materials								
Hurricane and Tropical Storm	X							X
Invasive Species								
Nor'Easter	X							X
Severe Weather	X							X
Severe Winter Weather	X							X
Wildfire								

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.6-1. Township of Frankford Hazard Area Extent and Location Map 1

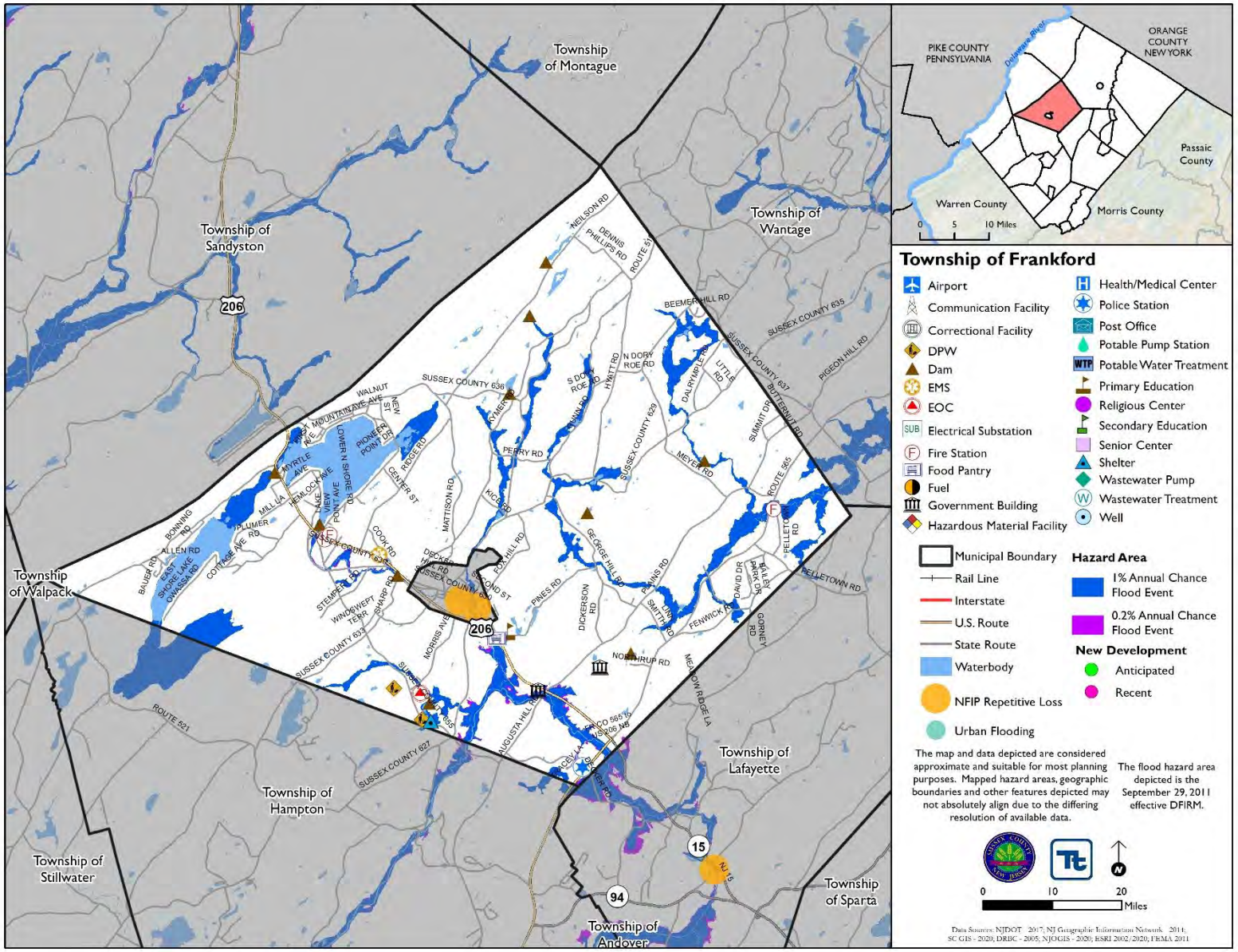


Figure 9.6-2. Township of Frankford Hazard Area Extent and Location Map 2

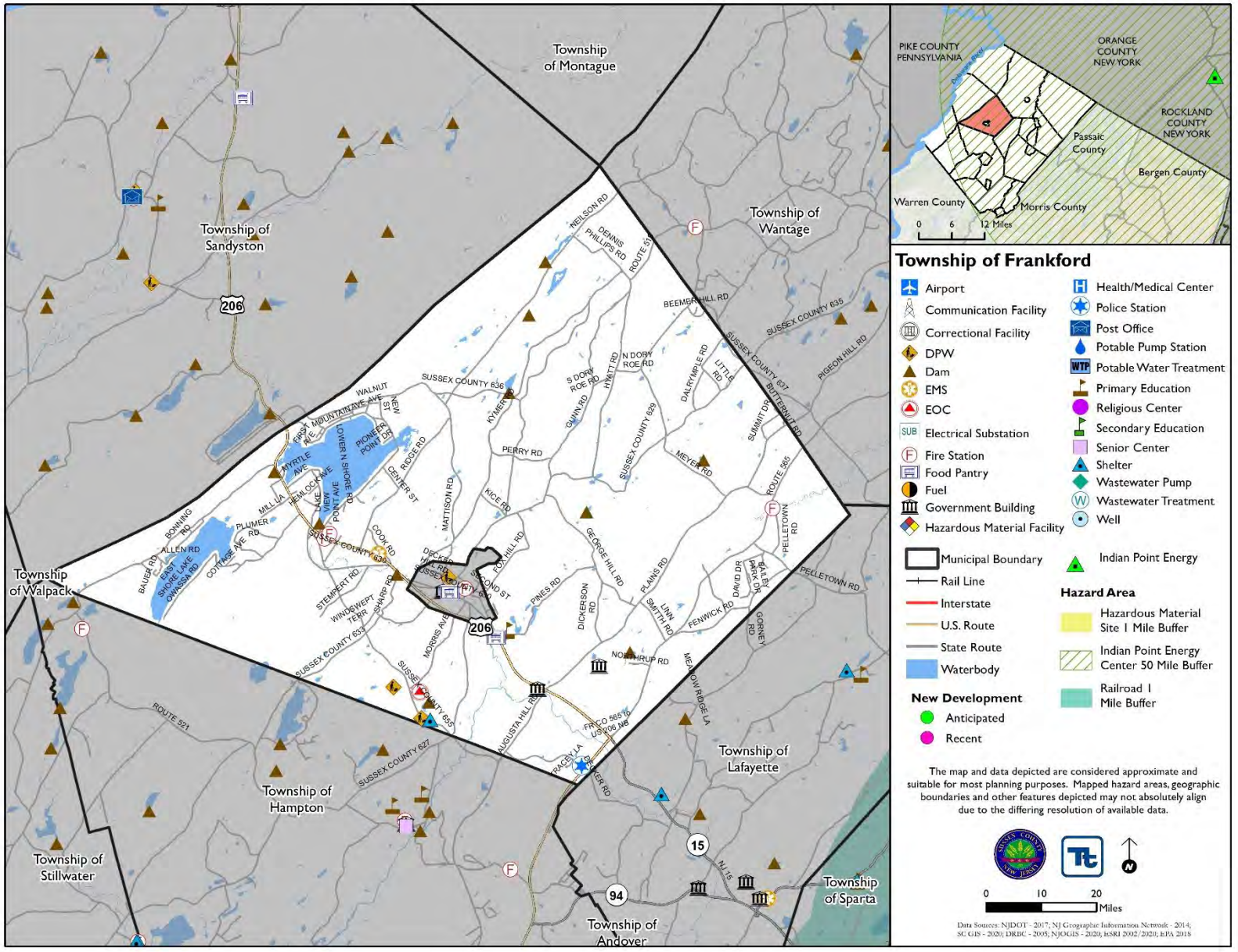
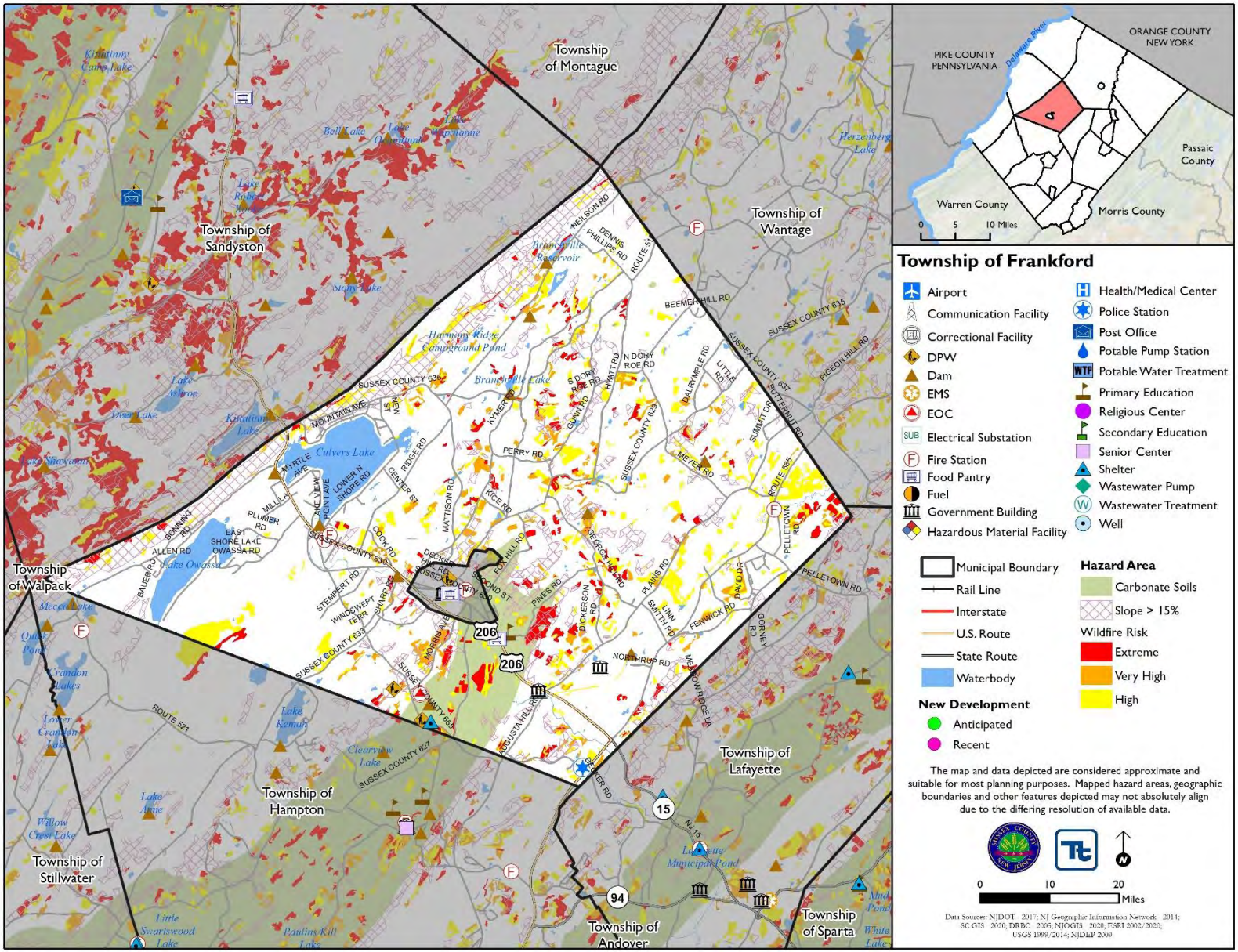


Figure 9.6-3 Township of Frankford Hazard Area Extent and Location Map 3



9.7 BOROUGH OF FRANKLIN

This section presents the jurisdictional annex for the Borough of Franklin. The annex includes a general overview of the Borough of Franklin; an assessment of the Borough of Franklin's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.7.1 Hazard Mitigation Planning Team

The Borough of Franklin followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.7-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Jim Williams, OEM Coordinator Address: 46 Main Street, Franklin, NJ 07416 Phone Number: (973) 600-9081 Email: lauranjenna@gmail.com	Name / Title: Brian VanDenBroek, DPW Supervisor Address: 46 Main Street, Franklin, NJ 07416 Phone Number: (862) 268-7788 Email: bvandenbroek@franklinborough.org
NFIP Floodplain Administrator	
Name / Title: Deborah Bonanno, Administrator Address: 46 Main Street, Franklin, NJ 07416 Phone Number: (973) 827-9280x102 Email: dbonanno@franklinborough.org	

Name	Title	Method of Participation
Jim Williams	OEM Coordinator	Primary point of contact
Brian VanDenBroek	DPW Supervisor	Alternate point of contact
Deborah Bonanno	Administrator	NFIP floodplain administrator; provided data and information to update the annex

9.7.2 Jurisdiction Profile

Franklin Borough was incorporated in 1913 and is known as the "Fluorescent Mineral Capital of the World." The Borough has a rich mining history and was widely recognized for its rich ore body containing more than 150 minerals. The Borough is located in eastern Sussex County and bordered to the north by the Borough of Hamburg, to the west by Hardyston Township, to the south by the Borough of Ogdensburg, and to the east by the Township of Hardyston. The Borough is also located within the New Jersey Highlands Region. The Wallkill River, Franklin Pond Creek and Wildcat Branch flow through the Borough.

According to the U.S. Census, the 2010 population for the Borough of Franklin was 5,045. The estimated 2018 population was 4,807, a 4.7 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 6.0 percent of the population is 5 years of age or younger and 13.6 percent is

65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.7.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.6-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.7-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	0	0	1	0	1	0	0	0	0	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0	0	0	0	0	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
Walsh Road	Residential	5 units	Walsh Road	??	Under Construction
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
JCM	Apartment Complex	300	Munsonhurst Road	Wetlands	Approval from Borough Needs State approval

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.7.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Borough of Franklin performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Borough of Franklin identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Borough of Franklin and where hazard mitigation has been integrated.

Table 9.7-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *This code follows State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Zoning Officer is responsible for this code in compliance with Chapter 161, Article 5 – Land Development – Zoning.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Zoning Officer is responsible for this ordinance in compliance with Chapter 161 – Land Development.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The Town Engineer is responsible for this ordinance in compliance with Chapter 161, Article 9 – Land Development, Stormwater and Flooding Controls.*					
Post-Disaster Recovery	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	Yes – if municipality has a Planning Board	No	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Engineering Department is responsible for these requirements.*					
Environmental Protection	Yes	Local	No	Yes	-
Comment: • *Chapter 168 Littering* • *Chapter 188 Nuclear Free Zone* • *Chapter 320 Solid Waste*					
Flood Damage Prevention	Yes	State & Local	Yes	Yes	2021-Franklin-005
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *Flood Damage Prevention, Chapter 128 of the municipal code is administered by the Floodplain Administrator. The Borough Administrator serves as the Floodplain Administrator.* • *It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:* o *A. Protect human life and health;* o *B. Minimize expenditure of public money for costly flood-control projects;* o *C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* o *D. Minimize prolonged business interruptions;* o *E. Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, bridges located in areas of special flood hazard;* o *F. Help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
o *G. Ensure that potential buyers are notified that property is in an area of special flood hazard; and* o *H. Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.* • *The Ordinance does not include language regarding freeboard requirements.*					
Wellhead Protection	No	-	No	-	-
Comment: There are three municipal wells in the Borough. A wellhead protection ordinance may be considered to protect the Borough's water supply.					
Emergency Management	Yes	Local	No	No	-
Comment: • *Chapter 34 Fire Department* • *Chapter 60 Police Department* • *Chapter 124 Fire Prevention*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other:	No	-	No	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Planning Board is responsible for this plan in compliance with 2003 Master Plan with reexamination in 2009.*					
Capital Improvement Plan	Yes	Local	No	No	-
Comment: *The Borough Council is responsible for this plan.*					
Disaster Debris Management Plan	No	-	No	-	2021-Franklin-006
Comment: *Goes to 75 Corkhill Road Facility (DPW)*					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	No	-	Yes	-	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.					
Stormwater Pollution Prevention Plan	Yes	State & Local	Yes	-	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.* • *Franklin is a Tier B community.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	Yes	Local	No	No	-
Comment: *In-House Comm. is responsible for this plan.*					
Shoreline Management Plan	No	-	No	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment: A Tourism Plan may be considered for the future.					
Business Development Plan	No	-	No	-	-
Comment:					
Other	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment: •					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Office of Emergency Management is responsible for this plan.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	Yes	County	No	-	-
Comment:					
Other	No	-	No	-	-
Comment:					

Table 9.7-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Construction Department
Does your jurisdiction have the ability to track permits by hazard area?	No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes The Borough has a buildable land inventory as part of its Housing Element.

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Borough of Franklin.

Table 9.7-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	No	-
Open Space Board / Committee	Yes	Part of the Planning Board
Economic Development Commission / Committee	Yes	Ad-hoc, now formalized

Staff/Personnel Resource	Available?	Department/Agency/Position
Warning Systems / Services (reverse 911, outdoor warning signals)	No	The Borough is seeking to implement a warning system.
Maintenance program to reduce risk	Yes	Franklin Borough Board of Public Works
Mutual aid agreements	Yes	Surrounding communities with written and verbal
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Contractors (annually)
Engineers or professionals trained in building or infrastructure construction practices	Yes	Contractors (annually)
Planners or engineers with an understanding of natural hazards	Yes	Contractors (annually)
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes	French & Parrello Denis Keenan
Staff with education/knowledge/training in low impact development	Yes	French & Parrello Denis Keenan
Surveyor	Yes	Contractors (annually)
Stormwater engineer	Yes	French & Parrello Denis Keenan
Personnel skilled or trained in GIS applications	Yes	Contractors (annually)
Local or state water quality professional	Yes	Brian/Van Cleef Associates
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM Coordinator
Watershed planner	No	
Environmental specialist	No	
Grant writers	Yes	Borough Staff
Resilience Officer	No	
Other:	No	-

Fiscal Capability

The table below summarizes financial resources available to the Borough of Franklin.

Table 9.7-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	No
No	No
State-Sponsored Grant Programs	Yes
No	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Franklin.

Table 9.7-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes- Police Department
Do you have personnel skilled or trained in website development?	No
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes The Borough posts information about natural hazard events as well as COVID-19.
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	Yes- looking to expand
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	Yes-OEM Committee
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes- discussions with Borough Council

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Franklin.

Table 9.7-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	No	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.7-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) – Strong/Moderate/Weak
Dam Failure	Weak
Disease Outbreak	Moderate
Drought	Strong

Hazard	Adaptive Capacity (Capabilities) – Strong/Moderate/Weak
Earthquake	Weak
Flood	Moderate
Geologic	Weak
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Strong
Nor'Easter	Strong
Severe Weather	Strong
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.7-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Administrator
Who is your floodplain administrator? (name, department/position)	Deborah Bonanno, Administrator
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	6/28/2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	Unknown
When was the most recent Community Assistance Visit or Community Assistance Contact?	December 1, 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA indicated that lack of training, staff and funding are barriers to running an effective floodplain management program in the Borough.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	11 policies

Criterion	Response
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	11 claims $75,888 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

Opportunities for Future Integration

- **Flood Damage Prevention Ordinance:** The Borough will update the Flood Damage Prevention Ordinance to include the state mandated freeboard requirement. (2021-Franklin-005)
- **Disaster Debris Management Plan:** The Borough will develop a Disaster Debris Management Plan. (2021-Franklin-006)
- **Wellhead Protection Ordinance:** The Borough will consider wellhead protection ordinances to protect its municipal water supply.

9.7.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Borough of Franklin's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.6-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.7-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	The Borough experienced excessive overtime due to snow removal operations, entailing 180.5 overtime hours across 10 full-time employees. The Borough also experienced excessive fuel costs and salt expenses associated with addressing the storm.
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	The Borough was subject to municipal office closures and social distancing and masking requirements.

Source: FEMA 2020, NOAA NCEI 2020

9.7.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Borough of Franklin risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Franklin that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Franklin has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Franklin.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019

Critical Facilities

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.7-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
22-227 Franklin Pond Dam	Dam	X	X

Source: Sussex County Planning Partnership 2020

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- During heavy rains, Franklin Pond crests over beach and causes erosion. It is filled in sand during storm events.
- On Rutherford Avenue, the drainage creek floods out because it cannot accept water fast enough
- Route 23- drainage system not designed to be large enough for deluges.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Borough of Franklin ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Borough of Franklin. The Borough of Franklin has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Borough of Franklin agreed with the calculated hazard rankings.

Table 9.7-13. Borough of Franklin Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Low	Medium	Medium	Low	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.7.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.6-15 and Table 9.6-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.7-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Franklin Boro-1 (revised old #3)	Conduct a study on the redevelopment of Rutherford Avenue. This would allow traffic heading north and south when Route 23 is closed due to an emergency. Once study is complete, identify mitigation actions to complete this project.	Borough Engineer with support from NJDOT	No progress		
Franklin Boro-2 (revised old #2)	Ensure continuity of operations at critical facilities. Purchase and install a generators for critical facilities in Borough: • First Aid Squad • Franklin Elementary School • Borough Hall	Borough OEM	In progress	X	2021-Franklin-002

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
	• Borough's Board of Public Works Water Division facility Borough's Board of Public Works Road Division facility				
Franklin Boro-3 (old #6)	Provide an all-hazards public education outreach program on mitigation related issues through social media and the Borough website.	Borough OEM	Ongoing capability / In progress	X	2021-Franklin-001
Franklin Boro-4 (new)	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Engineering via NFIP FPA with NJOEM, FEMA support	Ongoing capability		
Franklin Boro-5 (new)	Identify and establish a reverse 911 system for the Borough to use to alert residents during emergencies. Once set up, create an outreach program to all the residents of the Borough on how to sign up and use the system.	Borough OEM	In progress	X	2021-Franklin-001
Franklin-6 (new)	Conduct a study on the flooding of the Wallkill River and its impacts on the homes along Newton Avenue.	Engineering with support from NJDEP and Fish and Wildlife	No progress	X	
Franklin-7 (new)	Purchase and install a 3,000 gallon bi-fuel tank at the DPW facility on Corkhill Road. The tank would hold 2,000 gallons of gasoline and 1,000 gallons of diesel fuel. The fuel will be used for municipal vehicles.	Borough OEM and DPW	No progress		

In addition to the above progress, the Borough of Franklin identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- Backup generators have been installed at water pump stations and lift stations. The fire department and police department have generators, though the police department generator is undersized.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Franklin participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Franklin participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.6-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Franklin would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.6-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.7-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Franklin-001	Outreach Program	**Problem:** The Borough has identified a need to better communicate hazard and disaster information to the public using the internet, social media, and traditional venues. Currently the Borough does not have as much direct control on the website. **Solution:** The Borough proposes to develop and implement an outreach program that includes targeted outreach such as Reverse 9-1-1/textmygov, website and social media integration upgrades, and ADA compliance.	Existing	All Hazards	1, 3, 4, 6	Borough Administrator; Website vendor; Emergency Management; Sussex County Sheriff	HMGP; County; Borough Appropriations	Enhanced understanding and awareness of hazards	$10,000	Within one year	High	EAP	PR
2021-Franklin-002	Generators for Municipal Facilities	**Problem:** The Borough does not have generators for all municipal facilities. There are no standby generators available at the Rescue Squad, Franklin Elementary School, and Borough Hall. The Police Department's current generator is undersized. These facilities are vulnerable to power outages that would disrupt the operation of municipal functions during a hazard event. The following generator sizes are identified: • Police Dept 50 KW Diesel or Propane • Borough Hall 100KW Natural Gas • DPW Water Utility 30KW Diesel/Propane • DPW Road Dept 75KW Diesel or Propane • Elementary School 500KW Natural Gas • First Aid Squad 22KW Diesel or Propane **Solution:** The Borough proposes to purchase and install generators at municipal facilities, including Rescue Squad, Elementary School, Borough Hall, and Police Department.	Existing	All Hazards	1, 2, 3, 5, 6	Borough OEM; Public Works	BRIC; HMGP; Borough Appropriations	Continued operations of facilities during hazard incidents	High	Within three years	High	SIP	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Franklin-003	Franklin Pond Flood Study	**Problem**: During heavy rains, Franklin Pond crests over the beach and causes erosion. It has filled in with sand during storm events. FEMA has reimbursed rather than provided funding for mitigation projects, which poses a financial hardship. **Solution:** The Borough will conduct a flood study to determine what can be done to reduce flooding in Franklin Pond. Possible options include dredging of the pond, diverting runoff away from the pond, etc. Once cost-effective actions are identified, the Borough will carry out the selected actions.	N/A	Flood; Hurricanes and Tropical Storms; Nor'easters Severe Storms	2, 4, 5	Engineer	HMGP, BRIC, municipal budget	Reduction in flooding, silting of pond	TBD by flood study and selected actions	Within 5 years	Medium	SIP, NSP	SP, NR
2021-Franklin-004	Rutherford Avenue	**Problem**: The drainage creek on Rutherford Avenue floods out because it cannot accept water fast enough. FEMA has reimbursed rather than provided funding for mitigation projects, which poses a financial hardship. **Solution:** The Borough Engineer will design a larger drainage creek with a greater varying capacity. The Borough will then make the necessary upgrades.	Existing	Flood; Hurricanes and Tropical Storms; Nor'easters Severe Storms	2, 4, 5	Engineer	HMGP, BRIC, Borough budget	Reduction of flooding at Rutherford Avenue	High	Within 5 years	High	SIP	SP
2021-Franklin-005	Flood Damage Prevention Ordinance Update	**Problem**: The Borough's Flood Damage Prevention Ordinance lacks language to include the state mandated freeboard requirement. **Solution:** The Borough will update the Flood Damage Prevention Ordinance to include the state mandated freeboard requirement.	New	Flood	2, 5	Administration	Borough budget	Meet state standards	Staff time	Within 6 months	High	LPR	PR
2021-Franklin-006	Disaster Debris Management Plan	**Problem**: The Borough lacks a Disaster Debris Management Plan. **Solution:** The Borough will develop and adopt a Disaster Debris Management Plan. The Plan will include any necessary mutual aid discussions to supplement the Borough's capabilities.	Existing	All Hazards	5, 6	OEM, Administration	Borough budget	Increased disaster capabilities	Staff time	2 years	High	LPR	ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Franklin-007	Wallkill Creek Flood Study	**Problem**: The Wallkill Creek passes through Franklin Borough and poses a flood risk for residents throughout the community. **Solution:** The Borough will conduct a study on the flooding of the Wallkill River and its impacts on the homes along Newton Avenue.	Existing	Flood; Hurricanes and Tropical Storms; Nor'easters Severe Storms	2, 4, 5	Public Works	Borough budget	Enhanced understanding of flood issues	Low	Within five years	Medium	LPR	PR

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

BRIC	*Building Resilient Infrastructure and Communities*
FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.7-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Franklin-001	Outreach Program	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High ⚠
2021-Franklin-002	Generators for Municipal Facilities	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-Franklin-003	Franklin Pond	0	1	0	1	1	0	0	1	1	1	1	0	1	1	9	High
2021-Franklin-004	Rutherford Avenue	0	1	1	1	1	1	0	1	1	1	1	0	1	1	11	High
2021-Franklin-005	Flood Damage Prevention Ordinance Update	0	1	1	1	1	1	1	1	1	1	0	1	1	1	12	High
2021-Franklin-006	Disaster Debris Management Plan	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High
2021-Franklin-007	Wallkill Creek Flood Study	1	1	0	0	0	1	1	0	0	0	1	0	1	1	7	Medium

Notes: *Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.*
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.7-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure			X		X	X		X
Disease Outbreak			X		X	X		X
Drought			X		X	X		X
Earthquake			X		X	X		X
Flood	X		X	X	X	X	X	X
Geologic			X		X	X		X
Hazardous Materials			X		X	X		X
Hurricane and Tropical Storm	X		X	X	X	X		X
Invasive Species			X		X	X		X
Nor'Easter	X		X	X	X	X		X
Severe Weather	X		X	X	X	X		X
Severe Winter Weather			X		X	X		X
Wildfire			X		X	X		X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.7-1. Borough of Franklin Hazard Area Extent and Location Map 1

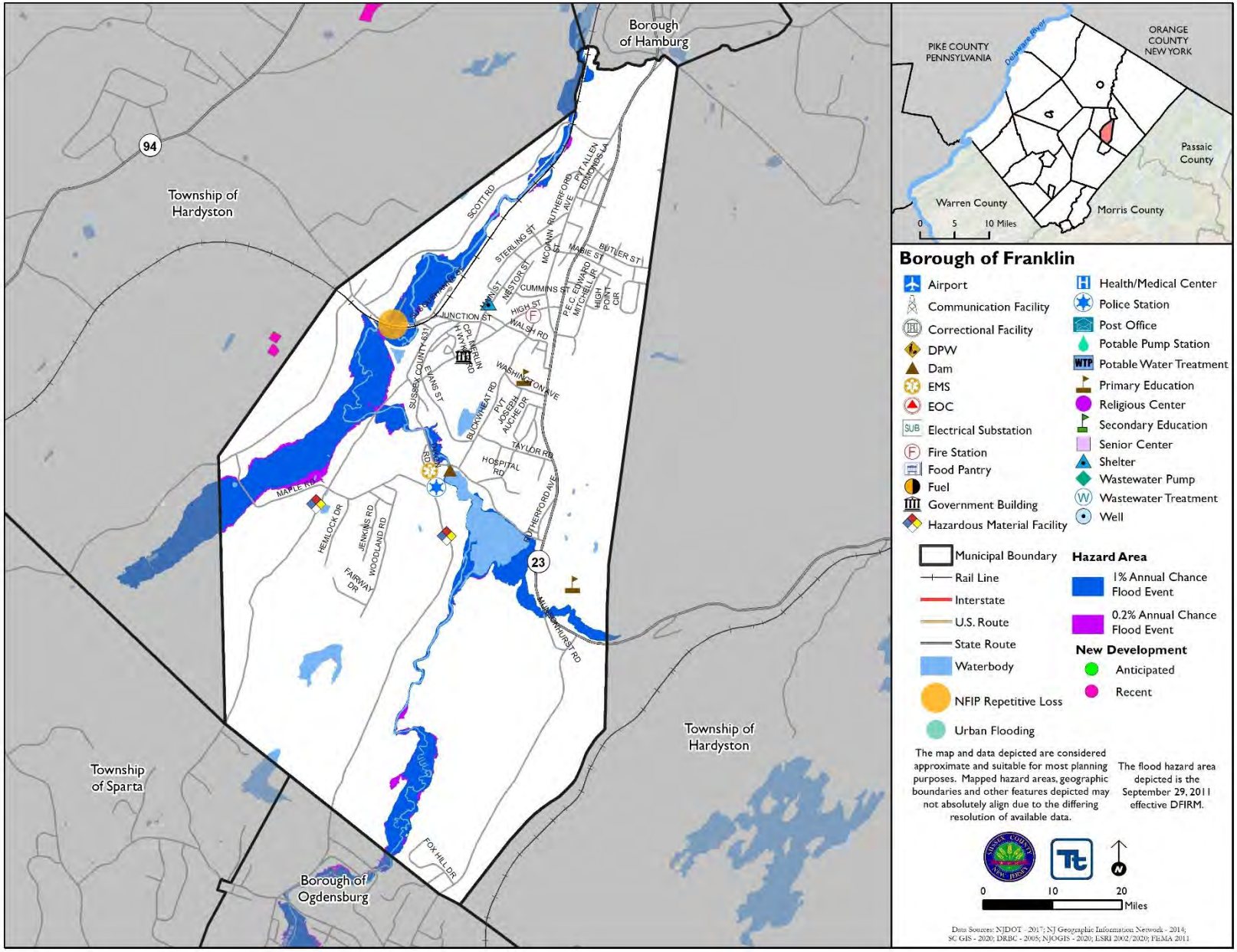


Figure 9.7-2. Borough of Franklin Hazard Area Extent and Location Map 2

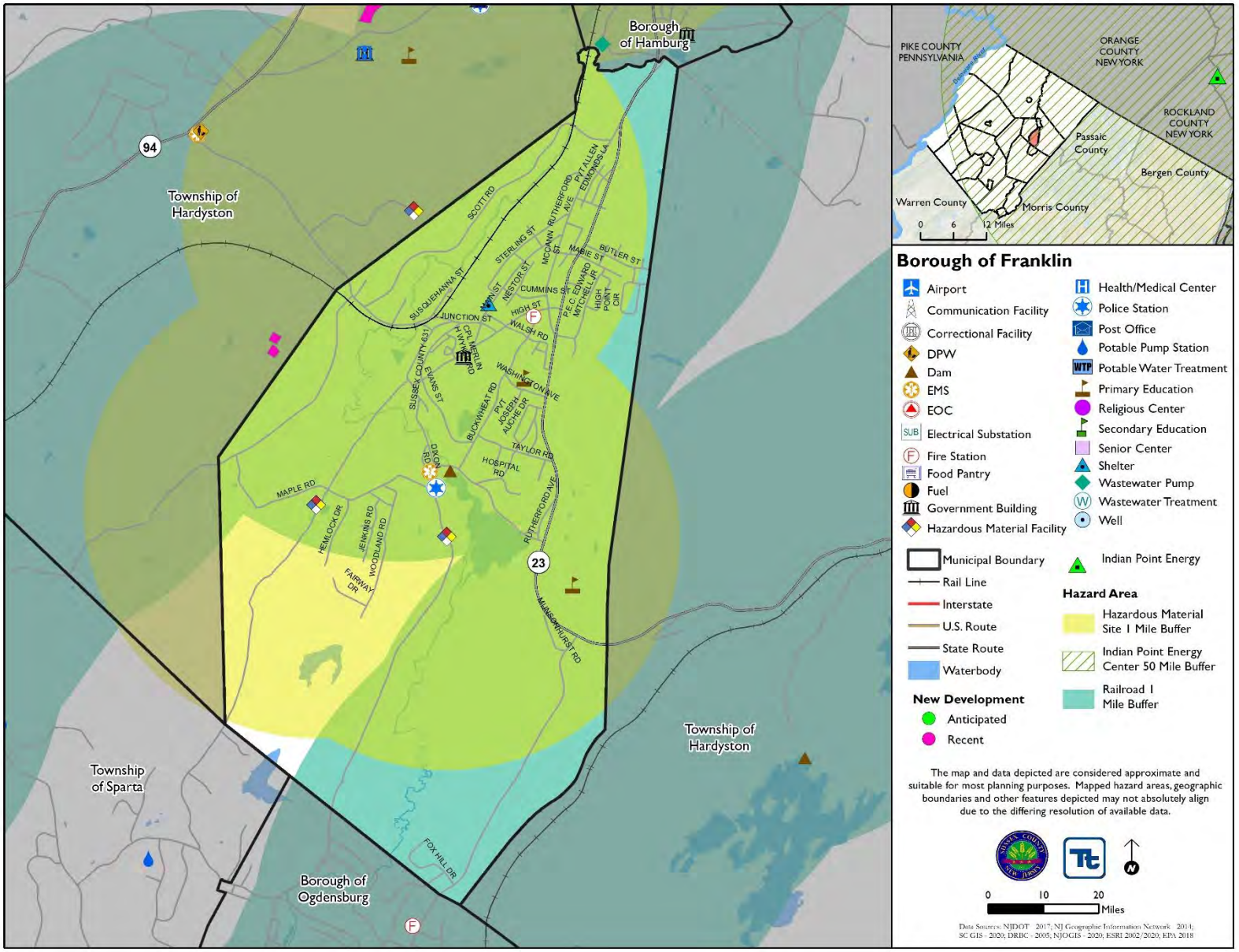
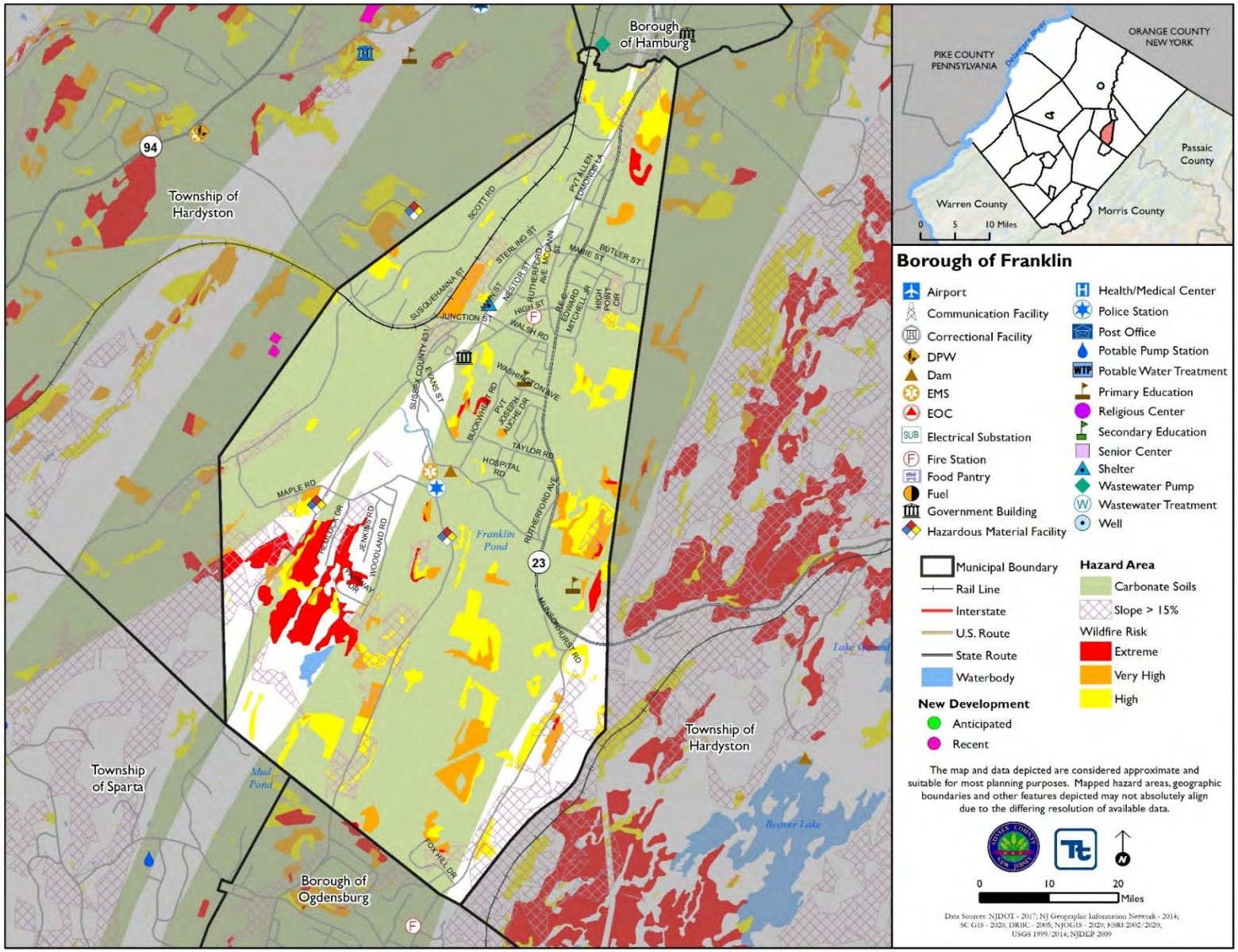


Figure 9.7-3 Borough of Franklin Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Outreach Program		
Project Number:	2021-Franklin-001		
Risk / Vulnerability			
Hazard(s) of Concern:	All Hazards		
Description of the Problem:	The Borough has identified a need to better communicate hazard and disaster information to the public using the internet, social media, and traditional venues. Currently the Borough does not have as much direct control on the website.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough proposes to develop and implement an outreach program that includes targeted outreach such as Reverse 9-1-1/textmygov, website and social media integration upgrades, and ADA compliance.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Enhanced understanding and awareness of hazards
Useful Life:	Indefinite	**Goals Met:**	1, 3, 4, 6
Estimated Cost:	$10,000	**Mitigation Action Type:**	Education and Awareness Programs
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within one year
Estimated Time Required for Project Implementation:	Six months	**Potential Funding Sources:**	HMGP; County; Borough Appropriations
Responsible Organization:	Borough Administrator; Website vendor; Emergency Management; Sussex County Sheriff	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Outsource	Medium	Less control over messaging
	Municipal outreach program	Low	Feasible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Outreach Program	
Project Number:	2021-Franklin-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Hazard awareness will save lives
Property Protection	1	Outreach will include structural mitigation
Cost-Effectiveness	1	
Technical	1	Technically feasible
Political	1	
Legal	1	
Fiscal	1	
Environmental	1	
Social	1	Project will protect social cohesion
Administrative	1	Project is administratively feasible
Multi-Hazard	1	All hazards
Timeline	1	
Agency Champion	1	Administration/OEM will champion
Other Community Objectives	1	
Total	14	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Generators for Municipal Facilities		
Project Number:	2021-Franklin-002		
Risk / Vulnerability			
Hazard(s) of Concern:	All Hazards		
Description of the Problem:	Problem: The Borough does not have generators for all municipal facilities. There are no standby generators available at the Rescue Squad, Franklin Elementary School, and Borough Hall. The Police Department's current generator is undersized. These facilities are vulnerable to power outages that would disrupt the operation of municipal functions during a hazard event. The following generator sizes are identified: • Police Dept 50 KW Diesel or Propane • Borough Hall 100KW Natural Gas • DPW Water Utility 30KW Diesel/Propane • DPW Road Dept 75KW Diesel or Propane • Elementary School 500KW Natural Gas • First Aid Squad 22KW Diesel or Propane		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough proposes to purchase and install generators at municipal facilities, including Rescue Squad, Elementary School, Borough Hall, and Police Department.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Continued operations of facilities during hazard incidents
Useful Life:	30 years	**Goals Met:**	1, 2, 3, 5, 6
Estimated Cost:	High-TBD	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within three years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	BRIC; HMGP; Borough Appropriations
Responsible Organization:	Borough OEM; Public Works	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Microgrid	High	Too expensive
	Targeted generators	High	Cost feasible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Generators for Municipal Facilities	
Project Number:	2021-Franklin-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Critical facilities will protect life safety
Property Protection	1	Project will protect critical facilities
Cost-Effectiveness	1	
Technical	1	Generators are technically feasible
Political	1	Generators are politically feasible
Legal	1	
Fiscal	1	
Environmental	1	
Social	1	Critical facility protection will protect social cohesion
Administrative	1	
Multi-Hazard	1	All Hazards
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	14	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Franklin Pond		
Project Number:	2021-Franklin-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	During heavy rains, Franklin Pond crests over the beach and causes erosion. It has filled in with sand during storm events. FEMA has reimbursed rather than provided funding for mitigation projects, which poses a financial hardship.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will conduct a flood study to determine what can be done to reduce flooding in Franklin Pond. Possible options include dredging of the pond, diverting runoff away from the pond, etc. Once cost-effective actions are identified, the Borough will carry out the selected actions.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD by flood study and selected actions	**Estimated Benefits (losses avoided):**	Reduction in flooding, silting of pond
Useful Life:	TBD by flood study and selected actions	**Goals Met:**	2
Estimated Cost:	TBD by flood study and selected actions	**Mitigation Action Type:**	Structure and Infrastructure Projects, Natural Systems Protection
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	5 years	**Potential Funding Sources:**	HMGP, BRIC, municipal budget
Responsible Organization:	Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation planning, stormwater planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate nearby roadways	$500,000	Costly and may not solve problem
	Relocate nearby roadways and properties	N/A	Not possible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Franklin Pond	
Project Number:	2021-Franklin-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	.
Property Protection	1	Reduction in flooding risk
Cost-Effectiveness	0	
Technical	1	Technically feasible project
Political	1	
Legal	0	The Borough may require permitting to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	Reduces silting of pond
Social	1	Project would reduce flooding impacts.
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	
Agency Champion	1	Engineer
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Rutherford Avenue		
Project Number:	2021-Franklin-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Rutherford-drainage creek floods out because it can't accept water fast enough. FEMA has reimbursed rather than provided funding for mitigation projects, which poses a financial hardship.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough Engineer will design a larger drainage creek with a greater varying capacity. The Borough will then make the necessary upgrades.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	At least a 5-year event; will be determined once project is complete	**Estimated Benefits (losses avoided):**	Reduction of flooding at Rutherford Avenue
Useful Life:	30 years	**Goals Met:**	2
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, Borough budget
Responsible Organization:	Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Remove nearby road and properties	Very High	Roadway cannot be removed
	Relocate road and properties to another location	N/A	Not feasible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Rutherford Avenue	
Project Number:	2021-Franklin-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Project will protect roadway from flooding, damages
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Flood
Timeline	0	Within 5 years
Agency Champion	1	Engineer
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	

9.8 TOWNSHIP OF FREDON

This section presents the jurisdictional annex for the Township of Fredon. The annex includes a general overview of the Township of Fredon; an assessment of the Township of Fredon's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.8.1 Hazard Mitigation Planning Team

The Township of Fredon followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.8-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Keith Festa, OEM Coordinator Address: 443 Route 94, Newton, NJ 07860 Phone Number: (516) 456-1374 Email: firecop1534@gmail.com	Name / Title: Glenn Deitz, Third OEM Coordinator Address: 30 Anderson Hill Road, Newton, NJ 07860 Phone Number: (973) 333-4244 Email: gdeitz@fredonnj.gov
NFIP Floodplain Administrator	
Name / Title: Keith Festa, OEM Coordinator Address: 443 Route 94, Newton, NJ 07860 Phone Number: (516) 456-1374 Email: firecop1534@gmail.com	

Name	Title	Method of Participation
Keith Festa	OEM Coordinator	Primary point of contact, NFIP floodplain administrator, contributed to mitigation strategy; attended the kickoff meeting, annex training
Glenn Deitz	OEM Coordinator	Alternate point of contact
Suzanne Boland	Registered Municipal Clerk	Provided data and information, contributed to mitigation strategy
Carl Lazzaro	OEM Coordinator, third	Attended the annex training and contributed to the annex development
Deborah Prommell	Acting Municipal Clerk	Attended the kickoff meeting and annex training

9.8.2 Jurisdiction Profile

The Township of Fredon was incorporated in 1904. The Township is located in southwestern Sussex County and has a total land area of 17.65 square miles. It is bordered to the north by Hampton Township, to the south by Green Township, to the east by Andover Township and Newton, and to the west by Stillwater Township and Warren County. The Pequest River, Paulins Kill, and Bear Brook all flow through the Township. In addition, numerous ponds and lakes are located throughout the Township.

According to the U.S. Census, the 2010 population for the Township of Fredon was 3,437. The estimated 2018 population was 3,214, a 6.49 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 8.0 percent of the population is 5 years of age or younger and 25 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.8.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.7-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.8-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	0	0	1	0	1	0	1	0	1	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0	0	0	0	0	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
None identified					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None anticipated					

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.8.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Fredon performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Fredon identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Fredon and where hazard mitigation has been integrated.

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Building Department is responsible for this code in compliance with Chapter 200 – Construction Codes, Uniform.*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Zoning Department is responsible for this code in compliance with Chapter 550- Zoning.*					
Subdivisions	Yes	Local & Federal	Yes – if municipality has a Land Use Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47); 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Planning and Zoning Department is responsible for this ordinance in compliance with Chapter 550- Zoning and Chapter 470- Subdivision of Land.* • *Fredon Township Ordinance 2021-03: Amending Chapter 457 Stormwater Management February 2021*					
Stormwater Management	Yes	Local & Federal	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The Planning and Zoning Department is responsible for this ordinance in compliance with Chapter 457 – Stormwater Control.* • *Fredon Township Ordinance 2021-03: Amending Chapter 457 Stormwater Management February 2021*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	Local	Land Use Board	Yes	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.* • *The Planning and Zoning Department is responsible for these ordinances.*					
Site Plan Review	Yes	Local	Land Use Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Planning and Zoning Department is responsible for these requirements in compliance with Chapter 424 – Site Plan Review.* • *Fredon Township Ordinance 2021-03: Amending Chapter 457-17 Stormwater Management February 2021*					
Environmental Protection	Yes	State	Yes	No	-
Comment: • Land Use Board applications require NJDEP Environmental Impact Statement if required. • The Zoning Ordinance (Chapter 550) includes the following purposes related to environmental protection: o To preserve agricultural lands and open space, and to ensure that any future development of farmland that does occur includes a component of preservation and is designed to minimize any visual and environmental impacts that may occur. o To preserve large tracts of land for open space and farmland by encouraging the development of new residential subdivisions in a cluster design. o To protect areas constrained by steep slopes, wetlands, Category 1 streams, flood-prone areas, forested areas and areas with threatened or endangered habitat.					
Flood Damage Prevention	Yes	Local	Yes	Yes	-
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *This ordinance follows Chapter 270- Flood Control, last amended February 2021* • *It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:* o *A. To protect human life and health;* o *B. To minimize expenditure of public money for costly flood control projects;* o *C. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* o *D. To minimize prolonged business interruptions;* o *E. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, bridges located in areas of special flood hazard;* o *F. To help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;* o *G. To ensure that potential buyers are notified that property is in an area of special flood hazard; and*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
o *H. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.*					
Wellhead Protection	No	-	No	-	-
Comment: Fredon Township has no public water systems.					
Emergency Management	Yes	Local	No	Yes	-
Comment: • *Chapter 85, Volunteer Fire Company and First Responders* • ***Chapter 262, Fire Company***					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other: NFIP Freeboard	Yes	State	No	Yes	-
Comment*:* • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Building Department is responsible for this code in compliance with Chapter 200 – Construction Codes, Uniform.*					
Other: Soil Erosion and Sediment Control	Yes	Local	No	Yes	-
Comment: *The Planning and Zoning Department is responsible for these ordinances in compliance with Chapter 441 – Soil Erosion and Sediment Control.*					
Other: Genetically Engineered Microorganisms	Yes	Local	No	Yes	-
Comment: • Chapter 290, Genetically Engineered Microorganisms deals with the release of microorganisms. • "The Township Committee shall adopt, by resolution, such rules and regulations which shall, in its discretion, be deemed reasonable and necessary governing the application for permission to release any genetically engineered microorganism into the outdoor environment of the Township, including, but not limited to, regulations requiring completion of appropriate applications; submission of a plan for environmental protection, containment and disposal; submission of a plan insuring the health, safety and welfare of the public; submission of approvals by appropriate state and federal governmental agencies; payment of fees and costs to the Township; survey and location of the release site and affected areas; and posting of appropriate sureties or other insurances to guarantee against liability for damage or loss."					
Other: Hazardous Materials	Yes	Local	No	Yes	-
Comment: • *Chapter 300, Hazardous Materials deals with the emergency response and cost recovery of hazardous materials.*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *The Planning Board is responsible for this plan. This plan was adopted in 2008.*					
Capital Improvement Plan	Yes	Local	No	Yes	-
Comment: *This Capitol Improvement Plan was adopted in 2015.*					
Disaster Debris Management Plan	Yes	Local	No	Yes	-
Comment: *Disaster debris is addressed within the Fredon Township Office of Emergency Management Emergency Operations Plan October 2018 and the Fredon Township Ordinance 2021-03: Amending Chapter 457-16 Stormwater Management February 2021.*					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Federal, State & Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The Land Use Board is responsible for this plan in compliance with the Master Plan.* • *Identified in Fredon Township Ordinance 2021-03: Amending Chapter 457 Stormwater Management February 2021*					
Stormwater Pollution Prevention Plan	Yes	Federal & Local	Yes	Yes	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.* • *Identified in Fredon Township Ordinance 2021-03: Amending Chapter 457 Stormwater Management February 2021*					
Urban Water Management Plan	No	-	No	-	-
Comment: *Fredon Township is a rural community this is not applicable.*					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	No	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	Yes	Local	No	Yes	-
Comment: *The Office of Emergency Management is responsible for this plan. This plan was adopted in 2014.*					
Agricultural Plan	Yes	Local	No	Yes	-
Comment: *The Land Use Board is responsible for this plan in compliance with the Master Plan.*					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	Yes	Local	No	Yes	-
Comment: *The Land Use Board is responsible for this plan in compliance with the Master Plan.*					
Other: Open Space Plan	Yes	State & Local	No	Yes	-
Comment: *The Planning Board is responsible for this plan. This plan was adopted in 2000.*					
Other: Stream Corridor Management Plan	Yes	Local	No	Yes	-
Comment: *The Land Use Board is responsible for this plan in compliance with the Master Plan.*					
Other: Watershed Management or Protection Plan	Yes	Local	No	Yes	-
Comment: *The Land Use Board is responsible for this plan in compliance with the Master Plan.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Office of Emergency Management is responsible for this plan. This plan was adopted in 2018.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	Local	Yes	Yes	-
Comment: • *Contained within Emergency Operations Plan.* • *The Office of Emergency Management is responsible for this plan. This plan was adopted in 2018.*					
Post-Disaster Recovery Plan	Yes	Local	Yes	Yes	-
Comment: • *Contained within Emergency Operations Plan.* • *The Office of Emergency Management is responsible for this plan. This plan was adopted in 2018.*					
Continuity of Operations Plan	Yes	Local	Yes	Yes	-
Comment: • *Contained within Emergency Operations Plan.* • *The Office of Emergency Management is responsible for this plan. This plan was adopted in 2018.*					
Public Health Plan	Yes	Local	Yes	Yes	-
Comment: • *Contained within Emergency Operations Plan.* • *The Office of Emergency Management is responsible for this plan. This plan was adopted in 2018.*					
Other	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					

Table 9.8-3. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes
Does your jurisdiction have the ability to track permits by hazard area?	No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Fredon.

Table 9.8-4. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Land Use Board	Yes	Combined Planning & Zoning Board
Mitigation Planning Committee	Yes	Fredon Township Committee
Environmental Board / Commission	Yes	Environmental Commission. The Fredon Township Environmental Commission is the focal point for environmental issues affecting the Township. The Commission's area of interest and activities include preservation of natural resources, conservation of open space, inventory of natural resources, water quality, environmental education, enhancement of the quality of life in the Township, solicitation of grants and historical preservation. Anything that may adversely affect or enhance the Township's environment is of interest to the Commission. The Commission is an advisory body to the Planning Board. The Commission reviews applications for development submitted to the Board and reports on elements that may have a negative impact on the environment.
Open Space Board / Committee	Yes	Open Space Commission. In an effort to preserve Fredon's rural character, the Open Space Commission was formed in the spring of 2006. The mission of this group is to identify and prioritize land parcels for preservation, make recommendation to the township committee, and develop partnerships with allied organizations. The group focuses on land that preserves agriculture, scenic views, water quality, wildlife, and passive/active recreation. The funds to

Staff/Personnel Resource	Available?	Department/Agency/Position
		support the purchases or preservation of land are generated by the Open Space Tax. In 2008, the Township Committee reduced the Open Space Tax from 2 cents to 1 cent per $100,000 of the revised assessed value of a home, and it was reduced again to 1/2 a cent in 2009.
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	No	-
Maintenance program to reduce risk	Yes	Tree trimming, stormwater catch basin maintenance
Mutual aid agreements	Yes	Verbal agreements
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Pellow Engineering
Engineers or professionals trained in building or infrastructure construction practices	Yes	State
Planners or engineers with an understanding of natural hazards	Yes	Pellow Engineering and State
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes	E. Banyra, Township Planner
Staff with education/knowledge/training in low impact development	Yes	E. Banyra, Township Planner
Surveyor	No	-
Stormwater engineer	Yes	Pellow Engineering
Personnel skilled or trained in GIS applications	No	-
Local or state water quality professional	Yes	Sussex County
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Appointed by Township Committee
Watershed planner	No	-
Environmental specialist	Yes	E. Banyra, Township Planner
Grant writers	No	-
Resilience Officer	No	-
Other: Professionals trained in conducting damage assessments	Yes	State Building Inspector

Fiscal Capability

The table below summarizes financial resources available to the Township of Fredon.

Table 9.8-5. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	No

Financial Resource	Accessible or Eligible to Use?
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	State Aid
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Fredon.

Table 9.8-6. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes, Mayor designated
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes, Website capable of messaging. Social media. Fire prevention programs are conducted annually at schools.

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Fredon.

Table 9.8-7. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	5	2014
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.8-8. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Weak
Disease Outbreak	Moderate
Drought	Weak
Earthquake	Weak
Flood	Weak
Geologic	Moderate
Hazardous Materials	Strong
Hurricane and Tropical Storm	Moderate
Invasive Species	Weak
Nor'Easter	Strong
Severe Weather	Strong
Severe Winter Weather	Moderate
Wildfire	Weak

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

The Township does not have access to resources to determine the possible impacts of climate change upon the municipality. The administration is not currently supportive of integrating climate change in policies or actions.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.8-9. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Land Use Board
Who is your floodplain administrator? (name, department/position)	Keith Festa, OEM Coordinator
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	2/2021
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	Meets N.J.S.A. 40-48-1 et seq
When was the most recent Community Assistance Visit or Community Assistance Contact?	December 7, 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes

Criterion	Response
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	No
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	3 policies $1,050,000 insurance in force $1,359 premium in force
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	2 claims $6,937 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

9.8.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Fredon's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.7-10 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.8-10. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	$6,810.81 Overtime for storm cleanup
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	$8.311.98

Source: FEMA 2020, NOAA-NCEI 2020

9.8.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Fredon risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Fredon that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Fredon has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Fredon.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019

Critical Facilities

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.8-11. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
None identified			

Source: Sussex County Planning Partnership 2020

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The Township would like to utilize the Civic Center at 436 NJ-94, Newton, NJ 07860 for emergency housing, use as a warming shelter, etc. However, the building will require upgrades. In addition, the shelter would require staffing as staffing from the Township is limited.
- Backup power sources are necessary to maintain critical services for critical facilities. The Township Civic Center requires a backup power source. The site also houses the fire house and EMS. The Township has plans to establish the Civic Center as an emergency shelter.
- The Greendell Road and Long Hill catch basin is in need of replacement in order to improve stormwater.
- Deer Run requires installation of a storm drain to allow for proper stormwater management and to reduce risk of flooding.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Fredon ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Fredon. The Township of Fredon has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Fredon agreed with the calculated hazard rankings.

Table 9.8-12. Township of Fredon Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.8.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.7-14 and Table 9.7-15 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.8-13. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Fredon-1 (old #1 and 11)	Harden the Township's Civic Center and EOC to FEMA 361 standards.	Township Administration, OEM	No Progress	X	2020-Fredon-001, 2020-Fredon-002
Fredon-2 (old #2 and 3)	When updating the roof of the Township school, incorporate current high wind standards into the design.	School Administration	No Progress		
Fredon-3 (old #6 and 8)	Conduct inundation studies for the dams located in the Township: twin dams at Warner Road and Paulinskill Lake Road and at Whittemore Pond.	Township Engineer	No Progress		
Fredon-4 (old #9)	Upgrade and improve stormwater culverts at	Township Engineer	No Progress		

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update? Check if Yes	Include in the 2021 HMP Update? Enter 2021 HMP Action #
	intersection of Pond Place and Slate Ridge.				
Fredon-5 (old #10)	Install stormwater runoff retention basin located at Newton Medical Center	Township Engineer, Hospital Administration	No Progress		
Fredon-6 (new)	Review the current hazard mitigation plan prior to updating plans, ordinances, etc. within the Township.	Township Administration	Completed; Fredon Township Ordinance 2021-03		
Fredon-7 (old #12)	Develop and implement a multi-hazard public outreach program.	Township Administration, OEM	Ongoing Capability		
Fredon-8 (new)	Continue with the process of adding additional radio equipment on an existing tower in the Township. Awaiting zoning sign off; then will complete project.	Township OEM and County OEM	No Progress		
Fredon-9 (revised old #4)	Ensure continuity of operations at critical facilities and municipal buildings. Identified at this time is to purchase and install backup generators at the following locations: • Town Hall/DPW • Civic Center • Township School	Township OEM	No Progress	X	2020-Fredon-002

In addition to the above progress, the Township of Fredon identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- None identified

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Fredon participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Fredon participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.7-14 summarizes the comprehensive-range of specific mitigation initiatives the Township of Fredon would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.7-15 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.8-14. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Fredon-001	Civic Center Emergency Shelter	**Problem**: The Township would like to utilize the Civic Center at 436 NJ-94, Newton, NJ 07860 for emergency housing, use as a warming shelter, etc. However, the building will require upgrades. In addition, the shelter would require staffing as staffing from the Township is limited. **Solution:** The Township will work with FEMA to identify what upgrades are needed to the facility to meet sheltering guidelines. Expected upgrades needed include cots, potential showering locations, etc. The Township will work with Sussex County OEM and the American Red Cross to establish sheltering staffing agreements.	Existing	All Hazards	1	OEM, FEMA, Sussex County OEM, American Red Cross	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, EMPG, Municipal Budget	Civic Center used for emergency sheltering	$125,000	Within 5 years	High	SIP	ES
2020-Fredon-002	Civic Center Backup Power	**Problem**: Backup power sources are necessary to maintain critical services for critical facilities. The Township Civic Center requires a backup power source. The site also houses the fire house and EMS. The Township has plans to establish the Civic Center as an emergency shelter. **Solution:** The Engineer will research what size generator is needed to power the Civic Center. The Township will then purchase and install the selected generator and necessary electrical components to supply backup power to the Municipal Building.	Existing	Severe Storm, Severe Winter Storm, Hurricane, Nor'Easter	1	Engineer, OEM	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Ensures continuity of operations of Civic Center	$50,000	Within 5 years	High	SIP	ES
2020-Fredon-003	Greendell Road And Long Hill Catch Basin Project	**Problem**: The Greendell Road and Long Hill catch basin is in need of replacement in order to improve stormwater. **Solution:** The Township Engineer will design the replacement catch basin. The DPW will install the catch basin designed by the Engineer.	Existing	Flood, Severe Weather	2	Engineer, DPW	HMGP, BRIC, Capitol Improvement Fund	Reduce flood risk, increase stormwater management	High	1 year	High	SIP	SP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Fredon-004	Storm Drain and Maintain Easement Deer Run Installation	**Problem**: Deer Run requires installation of a storm drain to allow for proper stormwater management and to reduce risk of flooding. **Solution:** The Township will secure an easement and design and construct a storm drain at Deer Run.	New	Flood, Severe Weather	2	Engineer, DPW	HMGP, BRIC, Capitol Improvement Fund	Reduce flood risk, increase stormwater management	High	6 months	High	SIP	SP

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
PDM	*Pre-Disaster Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.8-15. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2020-Fredon-001	Civic Center Emergency Shelter	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High ⚠
2020-Fredon-002	Civic Center Backup Power	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2020-Fredon-003	Greendell Road And Long Hill Catch Basin Project	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High
2020-Fredon-004	Storm Drain and Maintain Easement Deer Run Installation	0	1	1	1	1	0	1	1	1	1	1	1	1	1	12	High

Notes: *Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.*
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.8-16. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure					X			X
Disease Outbreak					X			X
Drought					X			X
Earthquake					X			X
Flood					X	X		X
Geologic					X			X
Hazardous Materials					X			X
Hurricane and Tropical Storm					X			X
Invasive Species					X			X
Nor'Easter					X			X
Severe Weather					X	X		X
Severe Winter Weather					X			X
Wildfire					X			X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard

ORANGE medium ranked hazard

YELLOW low ranked hazard

Figure 9.8-1. Township of Fredon Hazard Area Extent and Location Map 1

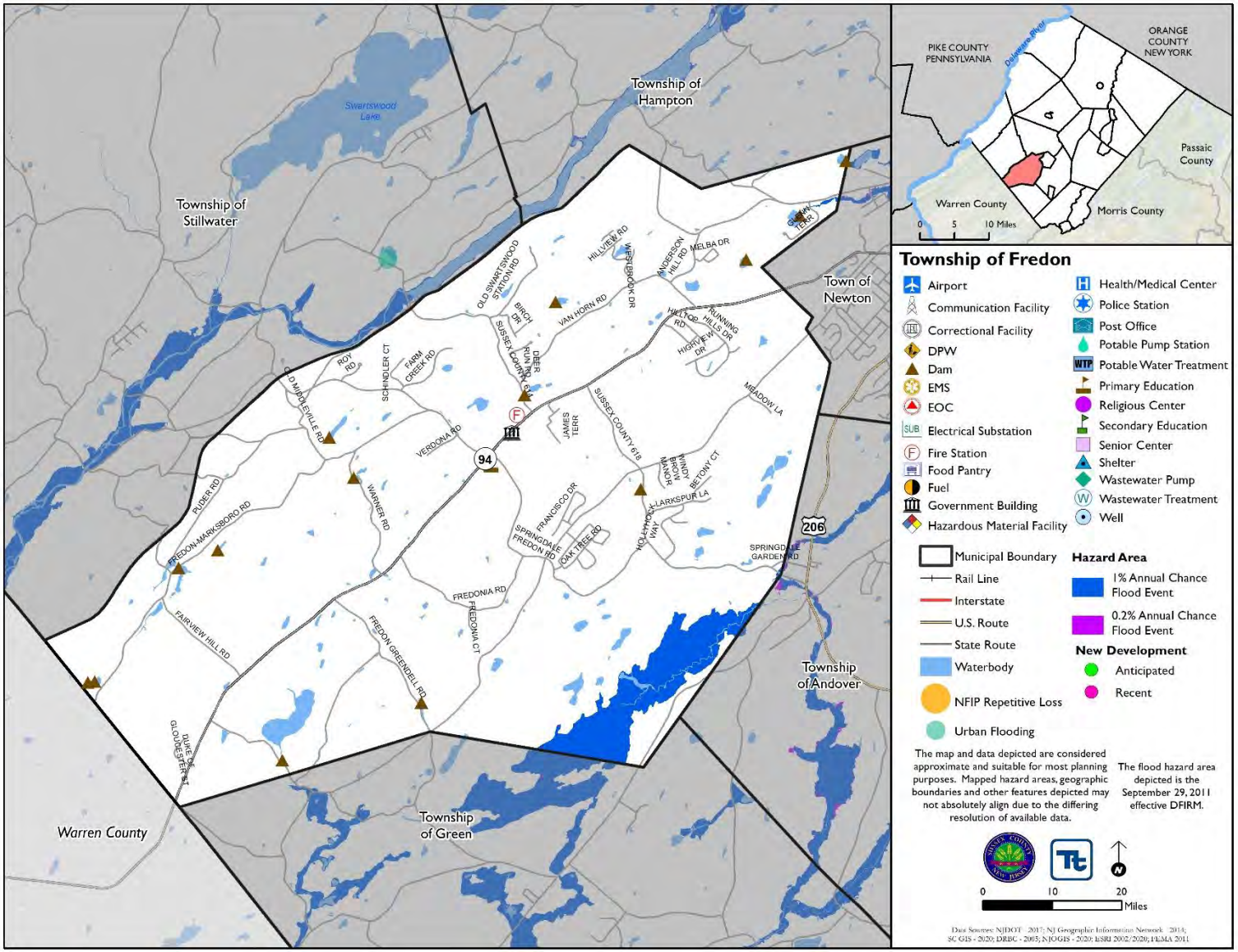


Figure 9.8-2. Township of Fredon Hazard Area Extent and Location Map 2

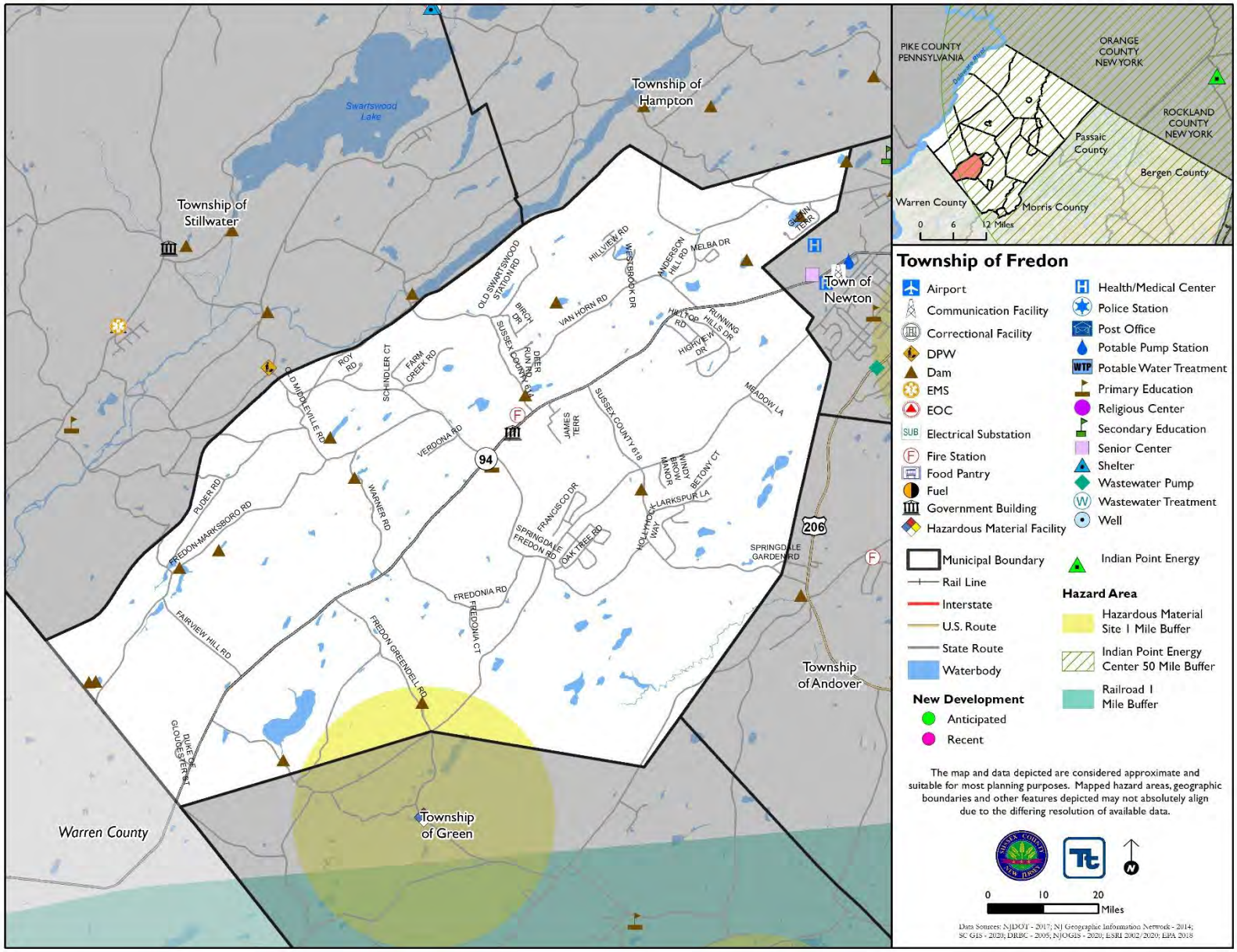
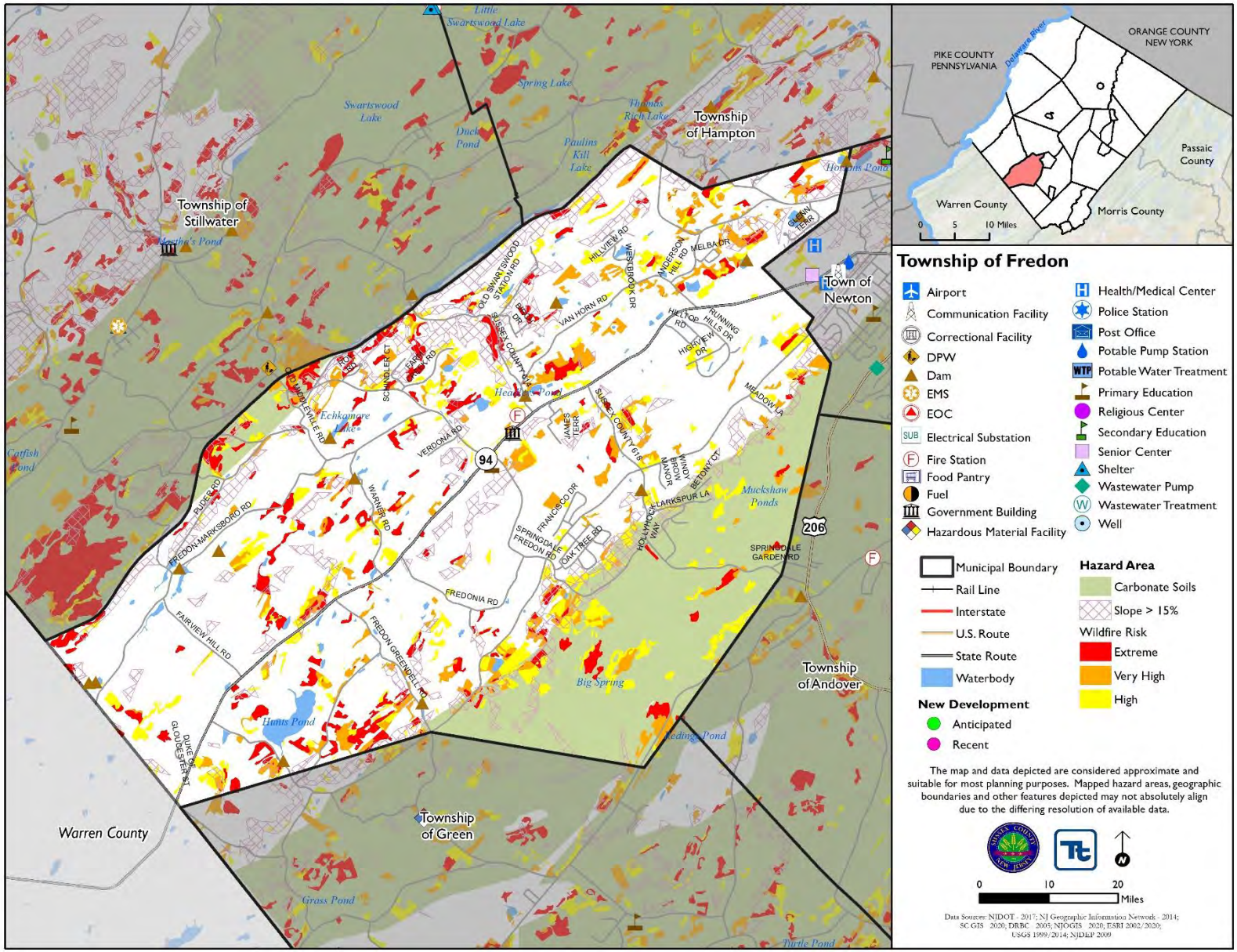


Figure 9.8-3 Township of Fredon Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Civic Center Emergency Shelter		
Project Number:	2020-Fredon-001		
Risk / Vulnerability			
Hazard(s) of Concern:	All Hazards		
Description of the Problem:	The Township would like to utilize the Civic Center at 436 NJ-94, Newton, NJ 07860 for emergency housing, use as a warming shelter, etc. However, the building will require upgrades. In addition, the shelter would require staffing as staffing from the Township is limited.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will work with FEMA to identify what upgrades are needed to the facility to meet sheltering guidelines. Expected upgrades needed include cots, potential showering locations, etc. The Township will work with Sussex County OEM and the American Red Cross to establish sheltering staffing agreements.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	Emergency shelter requirements	**Estimated Benefits (losses avoided):**	Civic Center used for emergency sheltering
Useful Life:	15 years	**Goals Met:**	1
Estimated Cost:	$125,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	6 months	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, EMPG, Municipal Budget
Responsible Organization:	OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, emergency management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Purchase multi-use trailers	$1M per trailer	Require deployment, limited space
	Build separate facility	High	Costly

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Civic Center Emergency Shelter	
Project Number:	2020-Fredon-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Provides sheltering
Property Protection	1	Project will strengthen building protections
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Township has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	All Hazards
Timeline	0	Within 5 years
Agency Champion	1	OEM
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Civic Center Backup Power		
Project Number:	2020-Fredon-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Storm, Severe Winter Storm, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. The Township Civic Center requires a backup power source. The site also houses the fire house and EMS. The Township has plans to establish the Civic Center as an emergency shelter.		
Action or Project Intended for Implementation			
Description of the Solution:	The Engineer will research what size generator is needed to power the Civic Center. The Township will then purchase and install the selected generator and necessary electrical components to supply backup power to the Municipal Building.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of Civic Center
Useful Life:	20 years	**Goals Met:**	1
Estimated Cost:	$50,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Engineer, OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Civic Center Backup Power	
Project Number:	2020-Fredon-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of the Civic Center and allow the building to be used for sheltering
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Storm, Severe Winter Storm, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Engineer, OEM
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Greendell Road And Long Hill Catch Basin Project		
Project Number:	2020-Fredon-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	The Greendell Road and Long Hill catch basin is in need of replacement in order to improve stormwater.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township Engineer will design the replacement catch basin. The DPW will install the catch basin designed by the Engineer.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	TBD by engineering study	**Estimated Benefits (losses avoided):**	Reduce flood risk, increase stormwater management
Useful Life:	20 years	**Goals Met:**	2
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6 months
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, Capitol Improvement Fund
Responsible Organization:	Engineer, DPW	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, Stormwater management
Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Buyout homes exposed to flooding	High	Costly
	Close roadways that experience flooding	Low	Loss of access
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Action Worksheet		
Project Name:	Greendell Road And Long Hill Catch Basin Project	
Project Number:	2020-Fredon-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Properties protected from flooding
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Township has the legal authority to complete the project
Fiscal	1	Project has funding support identified
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather
Timeline	1	1 year
Agency Champion	1	Engineer, DPW
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Storm Drain and Maintain Easement Deer Run Installation		
Project Number:	2020-Fredon-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Deer Run requires installation of a storm drain to allow for proper stormwater management and to reduce risk of flooding.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township Engineer will design the necessary stormwater improvements and new features. The DPW will install the stormwater system components designed by the Engineer.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	TBD by engineering study	**Estimated Benefits (losses avoided):**	Reduce flood risk, increase stormwater management
Useful Life:	20 years	**Goals Met:**	2
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	1 year
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, Capitol Improvement Fund
Responsible Organization:	Engineer, DPW	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, Stormwater management
Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Buyout homes exposed to flooding	High	Costly
	Close roadways that experience flooding	Low	Loss of access
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Action Worksheet		
Project Name:	Storm Drain and Maintain Easement Deer Run Installation	
Project Number:	2020-Fredon-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Properties protected from flooding
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	0	Project requires securing an easement
Fiscal	1	Project has funding support identified
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather
Timeline	1	1 year
Agency Champion	1	Engineer, DPW
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

9.9 TOWNSHIP OF GREEN

This section presents the jurisdictional annex for the Township of Green. The annex includes a general overview of the Township of Green; an assessment of the Township of Green's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.9.1 Hazard Mitigation Planning Team

The Township of Green followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.9-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Mark Zschack, Municipal Clerk/Administrator Address: 150 Kennedy Road, P.O. Box 65, Tranquility, NJ 07879 Phone Number: (908) 852-9333 x18 Email: clerkadmin@greentwp.com	Name / Title: Margaret "Peg" Phillips, Mayor Address: 150 Kennedy Road, P.O. Box 65, Tranquility, NJ 07879 Phone Number: (908) 852-9333 Email: pphillips@greentwp.com

NFIP Floodplain Administrator
Name / Title: Cory Stoner, Township Engineer Address: 17 Plains Road, Augusta, NJ 07822 Phone Number: 973-948-6463 Email: cstoner@hpellow.com

Name	Title	Method of Participation
Mark Zschack	Municipal Clerk/Administrator	Primary point of contact, provided data and information, contributed to mitigation strategy; attended the annex training and risk assessment meeting
Margaret "Peg" Phillips	Mayor	Alternate point of contact
Cory Stoner	Township Engineer	NFIP floodplain administrator

9.9.2 Jurisdiction Profile

Green Township is located in southwestern Sussex County and is bordered to the north by Fredon and Andover Townships, to the south and west by Warren County and to the east by Byram Township. The following unincorporated communities are located within the Township: Huntsburg, Greendell, Tranquility, and Huntsville. The Pequest River, Bear Brook, and Trout Brook are named streams that flow through the Township. Lake Tranquility, Buckmire Pond, and Turtle Pond are the larger named lakes located in the Township.

According to the U.S. Census, the 2010 population for the Township of Green was 3,601. The estimated 2018 population was 3,495, a 2.9 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 2.4 percent of the population is 5 years of age or younger and 15.2 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.9.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.8-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.9-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	6	2	2	0	4	0	2	2	0	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	2	0	1	0	2	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
Crossed Keys	Commercial	1	289 Pequest Road/Block 22 Lots 2 & 2.02	Nuclear Incident Hazard Area, Carbonate Soil, Hazardous Material Incident Hazard Area	Construction in Progress
Forest Flats	Industrial	1	Airport Road/ Block 31 Lot 1.05	Nuclear Incident Hazard Area, Carbonate Soil, Wildfire, Hazardous Material Incident Hazard Area	Construction in Progress
Ridge Rock	Industrial	1	Airport Road/ Block 31 Lot 1.09	Nuclear Incident Hazard Area, Railway Incident Hazard Area, Hazardous Material Hazard Area, Carbonate Soil	Construction in Progress

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Airside	Industrial	1	246 Brighton Road/ Block 26 Lot 4	Nuclear Incident Hazard Area, Carbonate Soil, Wildfire, Railway Incident Hazard Area	Construction in Progress
Tranquility Farms	Commercial	2	47 Decker Pond Road/ Block 113 Lot 3	Nuclear Incident Hazard Area, Carbonate Soil	Completed
Indoor Riding Ring	Commercial	1	81 Henry Road/ Block 9 Lot 4.01	Railway Incident Hazard Area	Completed
Gas Main	Infrastructure	N/A	Whitehall Road	Nuclear Incident Hazard Area, Railway Incident Hazard Area	Construction in Progress
Emerald Glen	Industrial	1	Airport Road/ Block 31 Lot 1.07	Nuclear Incident Hazard Area, Carbonate Soil, Wildfire, Hazardous Material Incident Hazard Area	
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Cedar Peak	Industrial	N/A	Airport Road/ Block 31 Lot 1.06	Nuclear Incident Hazard Area, Carbonate Soil, Wildfire, Hazardous Material Incident Hazard Area	Anticipated
Pine Summit	Industrial	N/A	Airport Road/ Block 31 Lot 1.04	Nuclear Incident Hazard Area, Railway Incident Hazard Area, Hazardous Material Hazard Area, Carbonate Soil	Anticipated
Overland Traverse	Industrial	N/A	Airport Road/ Block 31 Lot 1.03	Nuclear Incident Hazard Area, Railway Incident Hazard Area, Hazardous Material Hazard Area, Carbonate Soil	Anticipated
Ground Solar Array	Infrastructure	N/A	93 Airport Road/ Block 19 Lot 15	Nuclear Incident Hazard Area, Railway Incident Hazard Area, Hazardous Material Hazard Area, Carbonate Soil	Anticipated

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.9.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Green performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Green identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Green and where hazard mitigation has been integrated.

Table 9.9-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Zoning Official is responsible for this code in compliance with State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Zoning Official is responsible for this code in compliance with Chapter 30, Article XII.*					
Subdivisions	Yes	Local	Yes – if municipality has a	Yes	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
			Planning Board		
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Zoning Official is responsible for this ordinance in compliance with Chapter 30, Article IX.*					
Stormwater Management	Yes	County & Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The Township Committee is responsible for this ordinance in compliance with N.J.A.C. 5:21 – Section 30-17.1A.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	No	State, Division of Consumer Affairs	Yes	No	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	Yes – if municipality has a Planning Board	No	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Planning Board is responsible for these requirements in compliance with Chapter 30, Article IX.*					
Environmental Protection	No	-	No	-	-
Comment:					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	2021-Green-011

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Zoning Official is responsible for this ordinance in compliance with Chapter 25.* • *It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:* o *a. Protect human life and health;* o *b. Minimize expenditure of public money for costly flood control projects;* o *c. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* o *d. Minimize prolonged business interruptions;* o *e. Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, bridges located in areas of special flood hazard;* o *f. Help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;* o *g. Ensure that potential buyers are notified that property is in an area of special flood hazard; and* o *h. Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.* • *The ordinance requires update to include the state mandated freeboard requirement.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	No	-	No	-	-
Comment:					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Yes	County & Local	No	Yes	-
Comment: *The Township Committee and Engineering Department is responsible for these ordinances in compliance with Soil and Soil Removal Chapter 26 – purpose to control soil erosion and sediment damages and related environmental damage by requiring adequate provisions for surface water retention and drainage and for the protection of exposed soil surfaces in order to promote the safety, public health, convenience and general welfare of the community.*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen commissioners with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *The Planning Board is responsible for this plan in compliance with Master Plan Reexamination Report, Green Township, September 2008.*					
Capital Improvement Plan	No	-	No	-	-
Comment:					
Disaster Debris Management Plan	No	-	No	-	2021-Green-007
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The Planning Board is responsible for this plan.*					
Stormwater Pollution Prevention Plan	No	-	No	-	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other Plans	Yes	Local	No	No	No
Comment: • *The Planning Board is responsible for these plans in compliance with Green Township Land Use Plan, December 2005 and Housing Element and Fair Share Plan, December 2005.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Office of Emergency Management is responsible for this plan in compliance with EOP.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	No	-	No	-	-
Comment:					
Other	No	-	No	-	-
Comment:					

Table 9.9-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Building Department
Does your jurisdiction have the ability to track permits by hazard area?	Yes

Criterion	Response
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Green.

Table 9.9-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Green Township Planning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Green Township Environmental Advisory Committee
Open Space Board / Committee	Yes	Open Space Advisory Committee
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Smart911
Maintenance program to reduce risk	Yes	The Township works to identify and remove trees on municipal property that could affect electric power
Mutual aid agreements	Yes	Fire, First Aid
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Township Engineer/Township Planner
Engineers or professionals trained in building or infrastructure construction practices	Yes	Township Engineer
Planners or engineers with an understanding of natural hazards	Yes	Township Engineer/Township Planner
Staff with training in benefit/cost analysis	Yes	Township Engineer
Staff with training in green infrastructure	No	-
Staff with education/knowledge/training in low impact development	No	-
Surveyor	Yes	Township Engineer
Stormwater engineer	Yes	Township Engineer
Personnel skilled or trained in GIS applications	Yes	Township Engineer
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM
Watershed planner	No	-
Environmental specialist	No	-
Grant writers	Yes	Peter Sklannik
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Craig Bollmann, Zoning Officer

Fiscal Capability

The table below summarizes financial resources available to the Township of Green.

Table 9.9-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	N/A
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	Yes
Withhold Public Expenditures in Hazard-Prone Areas	Yes
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Green.

Table 9.9-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes
Do you have personnel skilled or trained in website development?	No
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	No

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Green.

Table 9.9-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	05/5Y	July 2014
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	None	Registered 12/16/2016

N/A = Not applicable. NP = Not participating

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.9-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

The Township does not have access to resources to determine the possible impacts of climate change upon the municipality. At this time, the administration is not supportive of integrating climate change in policies or actions.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.9-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Municipal Engineer
Who is your floodplain administrator? (name, department/position)	Cory Stoner
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	June 2016
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements.

Criterion	Response
When was the most recent Community Assistance Visit or Community Assistance Contact?	February 16, 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	He would consider attending continuing education and certification training on floodplain management.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	9 policies $2,630,000 insurance in force $6,920 premium in force
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	2 claims $11,652 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020 (Policy/Claims Data)*
Reference: FEMA 2020

Additional Areas of Existing Integration

- **Green Township Environmental Committee:** The Environmental Advisory Committee provides advice and recommendations to the Planning Board on environmental impacts of land use in the municipality in an effort to ensure that planning reflects consideration of natural resources and quality of life. Groundwater preservation is the current focus of activity.
- **Land Use Board:** The Green Township Land Use Board has the following responsibilities:
  - Adoption of a Master Plan every ten years;
  - Subdivision control and site plan review for permitted uses;
  - Recommendations as to the official map of the Township;
  - Conditional use applications;
  - Recommendations as to the zoning ordinance or amendments;
  - Review of Capital Improvement Projects;
  - Variances under certain circumstances in connection with site plans and subdivisions.
  - Hear and decide Appeals of decisions of the administrative officer enforcing the zoning ordinance;
  - Hear and decide for Interpretations of the zoning map or ordinance;
  - Hear and decide Bulk or "C" Variances; A "c" variance is if it is separate from a site plan, subdivision or conditional use (i.e.. residential permit that doesn't require a subdivision or site plan)
  - Hear and decide Use or "D" Variances: example of a "d" variance; Use of principle structure; Expansion of non-conforming use; deviation from a specification of standard of a conditional use;

Increase in permitted floor area ration; Increase in permitted density; Height greater than 10 feet or 10% of the maximum height permitted.

- May direct the Issuance of a Permit for a building or structure in the bed of a mapped street or public drainage way, flood control basin or public area. A building structure not related to a street.

- **Township Website:** Green Township hosts a municipal website (http://www.greentwp.com/index.cfm) which includes community information, news, and announcements.

OPPORTUNITIES FOR FUTURE INTEGRATION

- **Disaster Debris Management Plan:** The Township intends to develop a Disaster Debris Management Plan (2021-Green-007).
- **Flood Damage Prevention Ordinance:** The Township's flood damage prevention ordinance lacks the state mandated freeboard requirement. The Township will update the ordinance to include freeboard (2021-Green-011).

9.9.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Green's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.8-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.9-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Although the County was impacted, the Township did not receive damages.
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	Additional cost for equipment and overtime

Source: FEMA 2020, NOAA NCEI 200

9.9.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Green risk assessment results and data used to determine the hazard ranking discussed later in this section.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Township of Green that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can

be clearly identified using mapping techniques and technologies and for which the Township of Green has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Green.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.9-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
21-15 Tranquility Mill Dam	Dam	X	X
21-52 Lake Tranquility Dam	Dam	X	X
21-91 Tranquility Church Dam	Dam	X	X

Source: Sussex County Planning Partnership, 2020
Note:
**Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- Road flooding on Whitehall Road near Washers Pond (40-58'29.58" N / 74-45'32.63" W) Roadway will be raised in 2021 as part of a road improvement project.
- Lake Tranquility properties are inundated with ground water. A drainage study of the entire lake community is warranted.
- The Township has a lack of stand pipes at draft stations for emergency equipment.
- Basements of homes in the Township flood during periods of heavy rain and the residents do not have pumps to remove the water.
- Pequest River experiences streambank erosion.
- The Township lacks outreach to address hazards, emergency preparedness, and hazard mitigation.
- The Township lacks a Disaster Debris Management Plan.
- Hunts School Road has an undersized drainage pipe that contributes to flooding.
- Backup power sources are necessary to maintain critical services for critical facilities. The Tranquility Post Office and the Greendell Post Office lack backup power. The Township owns both properties.
- No mapping exists of the drainage system in Green Township to help identify and solve problem areas.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves

an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Green ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Green. The Township of Green has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Green agreed with the calculated hazard rankings.

Table 9.9-13. Township of Green Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.9.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.8-15 and Table 9.8-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.9-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Green Twp-1	Ensure continuity of operations at critical facilities and municipal buildings. Identified at this time: Add or replace permanent generators at critical facilities (municipal building, Road Dept., Fire Station, Squad Building)	OEM Coordinator Fire Department	Complete		
Green Twp-2	Purchase and install repeaters on two existing towers in the Township. This will increase the level of emergency communities both inter and intra-agency.	OEM Coordinator Fire Department	No progress		

2016 Action Number Action Description		Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Green Twp-3	Ensure continuity of operations: Purchase portable generators (12) to ensure those in need have the life support needed during and after an event.	First Aid Captain, Fire Chief, Administrator (Engineer)	Complete		
Green Twp-4	Add stand pipes at draft sites – 2 or more throughout Township	Administrator OEM Coordinator	No progress	X	2021-Green-003
Green Twp-5	Purchase/replace portable water pumps (12) to ensure those who experience flooding in conjunction with loss of power are adequately protected from loss of structure and/or mold issues.	Fire Chief, Administrator	No progress	X	2021-Green-004
Green Twp-6 (old #3)	Work with private land owners to stabilize stream bank(s) and augment Pequest River	Township Engineer	No Progress	X	2021-Green-005
Green Twp-7 (old #4)	Retrofit impact resistant windows and shutters on municipal building located on Kennedy Road as funding permits	DPW	No Progress		
Green Twp-8 (old #5)	Retrofit an external frame to mitigate straight line winds to PO building located on Municipal Rd as funding permits	Township Administrator	No Progress		
Green Twp-9 (old #6)	Retrofit roof on remaining building to meet current high wind standards located at Trinca Airport on Airport Road	Township Administrator	No Progress		
Green Twp-10 (old #7)	Implement a storm water runoff management system for 350 homes in Lake Tranquility area as funding and private cooperation permit	DPW	No Progress	X	2021-Green-002
Green Twp-11 (old #8)	Conduct all-hazards public education and outreach program for hazard mitigation and preparedness.	OEM Coordinator, in coordination with SCDEM	No Progress	X	2021-Green-006
Green Twp-12 (new)	Review the current hazard mitigation plan and other hazard analysis prior to land use, zoning changes and development permitting.	Township Engineer and Planner	Ongoing Capability		
Green Twp-	Provide protection to buildings/infrastructure in high hazard areas in the Township	Township Engineer and Planner	No Progress		

2016 Action Number Action Description		Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
13 (new)					
Green Twp – 14 (old #1)	Work with school to retrofit roof to meet current high wind standards on Green Hills School located on Mackerley Road as funding permits.	Township Administrator, School Board	Complete		
Green Twp – 15 (old #2)	Implement Fire Wise	OEM Coordinator	No Progress		

In addition to the above progress, the Township of Green identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- None identified.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Green participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Green participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.8-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Green would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.8-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.9-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Green-001	Whitehall Road Roadway Elevation	**Problem**: Road flooding on Whitehall Road near Washers Pond restricts normal travel and greatly effects emergency access. During Hurricane Irene the road surface was covered for months by six feet of water. In high rain years the roadway is partially flooded also creating a driving hazard. **Solution:** A four hundred- and fifty-foot (450') section of the road will need to reconstructed. The area of flooding will need to be raised approximately eighteen inches (18") to mitigate the semi-annual flooding. The slope along Washers Pond will require grading and a guide rail needs to be replaced.	Existing	Flood, Severe Weather	2	Engineer, DPW	HMGP, BRIC, Township budget	Reduction in roadway flooding	High	1 year	High	SIP	PP
2021-Green-002	Lake Tranquility Drainage Study	**Problem**: Lake Tranquility properties are inundated with water runoff and ground water. **Solution:** The Township will conduct drainage study of the entire lake community and determine if actions can be taken to address groundwater flooding in Lake Tranquility. Once actions are identified, the Township will carry out the cost-effective options. A potential action would be to implement a storm water runoff management system for 350 homes in Lake Tranquility area as funding and private cooperation permit. Drainage easements need to be created allowing the Township the authorization to access and maintain.	Existing	Flood	2, 4, 5	Engineer	HMGP, BRIC, FMA, Township budget	Better understanding of flooding and addressing of flood risk	High	Within 5 years	High	LPR, SIP	PP, SP
2021-Green-003	Stand Pipes at Draft Sites	**Problem**: Water systems are limited in Green Township therefore the need for a water source to combat fires is paramount. The Township has a lack of stand pipes at draft stations for emergency equipment. **Solution:** Additional areas for the installation of a stand pipe or draft stations will be researched and	N/A	Hazardous Materials, Wildfire	3, 6	Administrator, OEM Coordinator	HMGP, Township budget	Increased emergency response capability.	Medium	Within 5 years	High	SIP	ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		determined. Once the locations are established funding and or easements will need to be secured.											
2021-Green-004	Portable Water Pumps	**Problem**: Basements of homes in the Township flood during periods of heavy rain and the residents do not have pumps to remove the water. **Solution:** Purchase/replace portable water pumps (12) to ensure those who experience flooding in conjunction with loss of power are adequately protected from loss of structure and/or mold issues.	N/A	Flood	2, 5	Fire Chief, Administrator	Township budget	Increased emergency response capability.	Medium	Within 5 years	Medium	SIP	ES
2021-Green-005	Pequest River	**Problem**: The Pequest River experiences streambank erosion. **Solution:** Identify areas of the Pequest River where erosion and undermining of the river bank are occurring. Work with the Township Engineer and private land owners in developing plans to stabilize these locations.	Existing	Flood, Severe Weather	1, 2	Township Engineer	HMGP, BRIC, Township budget	Erosion and flood issues reduced	Medium	Within 5 years	High	NSP	NR
2021-Green-006	All Hazards Outreach	**Problem**: The Township lacks outreach to address hazards, emergency preparedness, and hazard mitigation. **Solution:** Develop and conduct all-hazards public education and outreach program for hazard mitigation and preparedness. Utilize Township social media outlets to communicate with township residents.	New & Existing	All Hazards	3	OEM Coordinator, in coordination with SCDEM	Township budget	Educated public	Low	1 year	High	EAP	PI
2021-Green-007	Disaster Debris Management Plan	**Problem**: The Township lacks a Disaster Debris Management Plan. **Solution:** The Township will develop and adopt a Disaster Debris Management Plan.	Existing	All Hazards	2, 5	OEM, Public Works	Township budget	Increased disaster response capabilities	Staff time	1 year	High	LPR	ES
2021-Green-008	Hunts School Road	**Problem:** Hunts School Road has an undersized drainage pipe that contributes to flooding. **Solution:** The Township will replace and upsize the drainage pipe.	Existing	Flood, Severe Weather	2	Public Works	HMGP, BRIC, Township budget	Reduction in flood risk	$75,000	Within 5 years	High	SIP	SP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Green-009	Post Office Backup Power	**Problem:** Backup power sources are necessary to maintain critical services for critical facilities. The Tranquility Post Office and the Greendell Post Office lack backup power. The Township owns both properties. **Solution:** The Township will consider the installation of backup generators at each site. The Engineer will research what size generator is needed to power the facilities. The Township will then purchase and install the selected generator and necessary electrical components to supply backup power to the facilities.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter	2, 6	OEM, Engineer, Administration	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Ensures continuity of operations of Post Office	$50,000 per generator	Within 5 years	High	SIP	ES
2021-Green-010	Drainage System Mapping	**Problem:** No mapping exists of the drainage system in Green Township to help identify and solve problem areas. **Solution:** The Township will contract with an engineering firm to create detailed mapping of all drainage infrastructure.	Existing	Flood, Severe Weather	4, 5	Public Works	Township budget	Increased capability to identify issues and needs for improvement	High	Within 5 years	Medium	LPR	SP
2021-Green-011	Flood Damage Prevention Ordinance Update	**Problem:** The Township's Flood Damage Prevention Ordinance lacks the state mandated freeboard requirement.	New	Flood	2	FPA, Administration	Township budget	Meet state standards, reduce future flood risk	Staff time	6 months	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		Solution: The Township will update the Flood Damage Prevention Ordinance to include the freeboard requirement.											

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC Program	*Building Resilient Infrastructure and Communities*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.9-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Green-001	Whitehall Road Roadway Elevation	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High ⚠
2021-Green-002	Lake Tranquility Drainage Study	0	1	0	1	1	1	0	1	1	0	1	0	1	1	9	High
2021-Green-003	Stand Pipes at Draft Sites	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Green-004	Portable Water Pumps	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Green-005	Pequest River	0	1	1	1	1	0	0	1	1	1	1	0	1	1	10	High
2021-Green-006	All Hazards Outreach	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-Green-007	Disaster Debris Management Plan	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High
2021-Green-008	Hunts School Road	1	1	0	1	1	1	0	1	0	0	1	0	1	1	9	High
2021-Green-009	Post Office Backup Power	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Green-010	Drainage System Mapping	0	1	1	1	1	1	1	1	1	1	1	0	1	1	12	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.9-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure			X		X			X
Disease Outbreak			X		X			X
Drought			X		X			X
Earthquake			X		X			X
Flood		X	X	X	X	X		X
Geologic			X		X			X
Hazardous Materials			X		X			X
Hurricane and Tropical Storm			X		X			X
Invasive Species			X		X			X
Nor'Easter			X		X			X
Severe Weather		X	X	X	X	X		X
Severe Winter Weather			X		X			X
Wildfire			X		X			X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.9-1. Township of Green Hazard Area Extent and Location Map 1

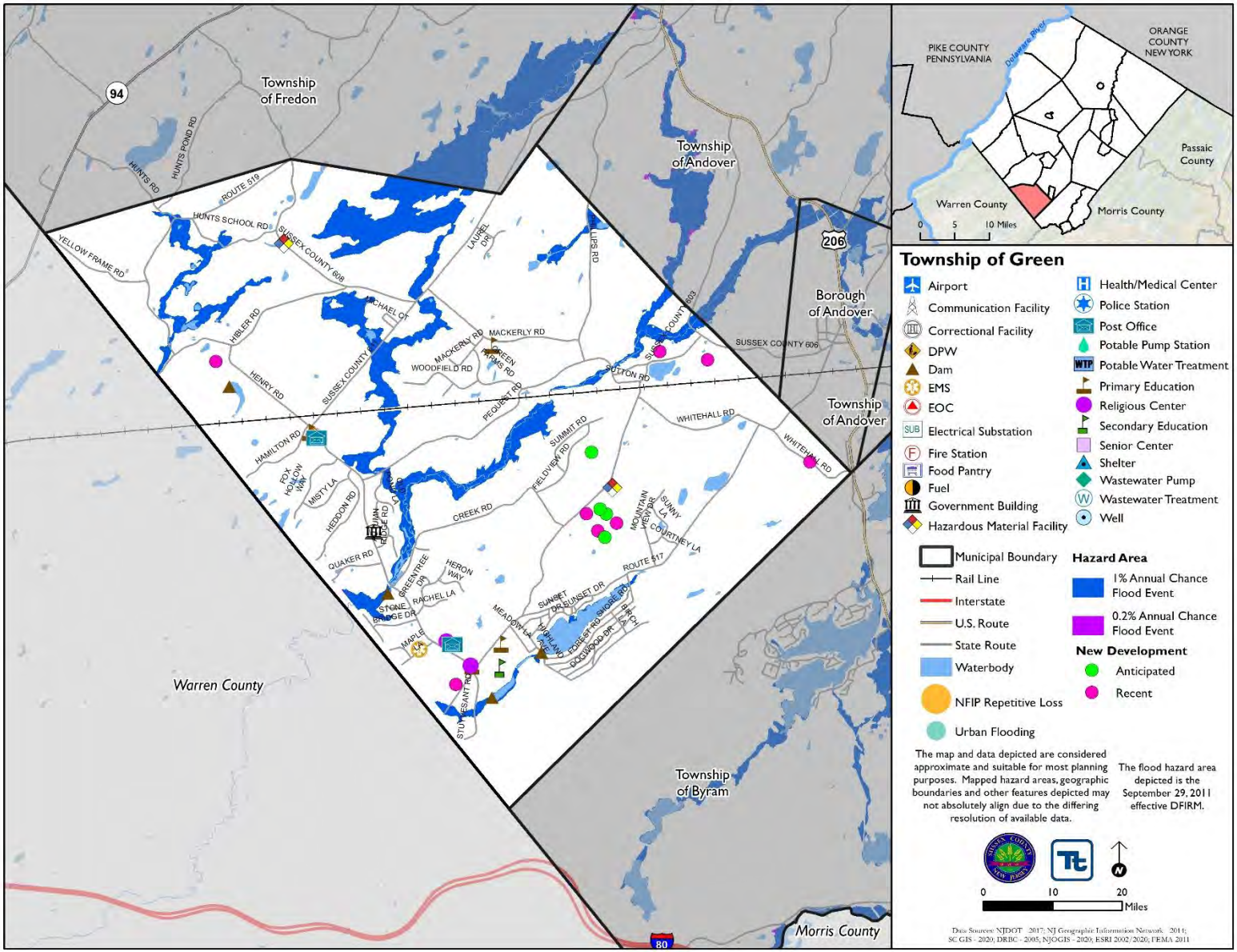


Figure 9.9-2. Township of Green Hazard Area Extent and Location Map 2

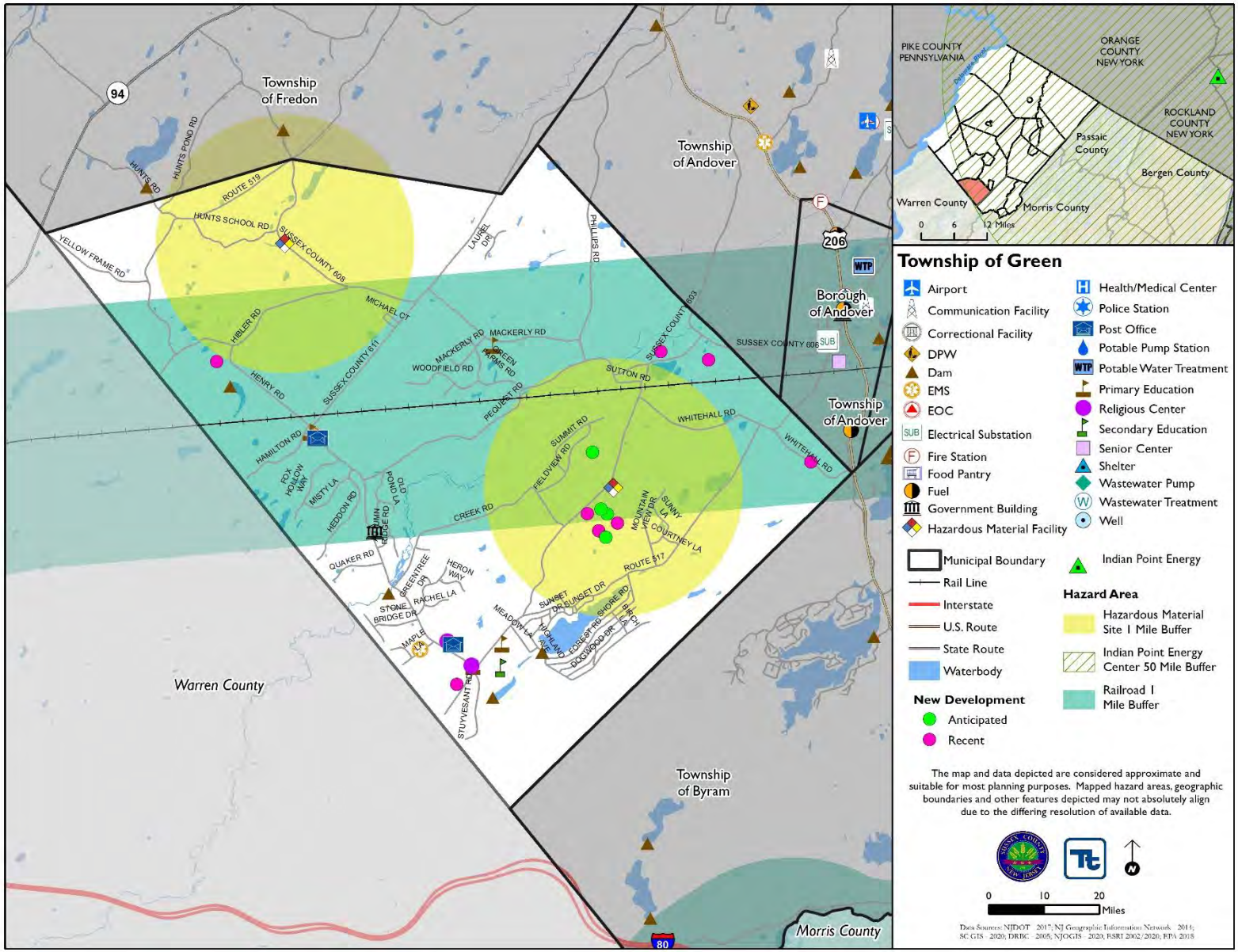
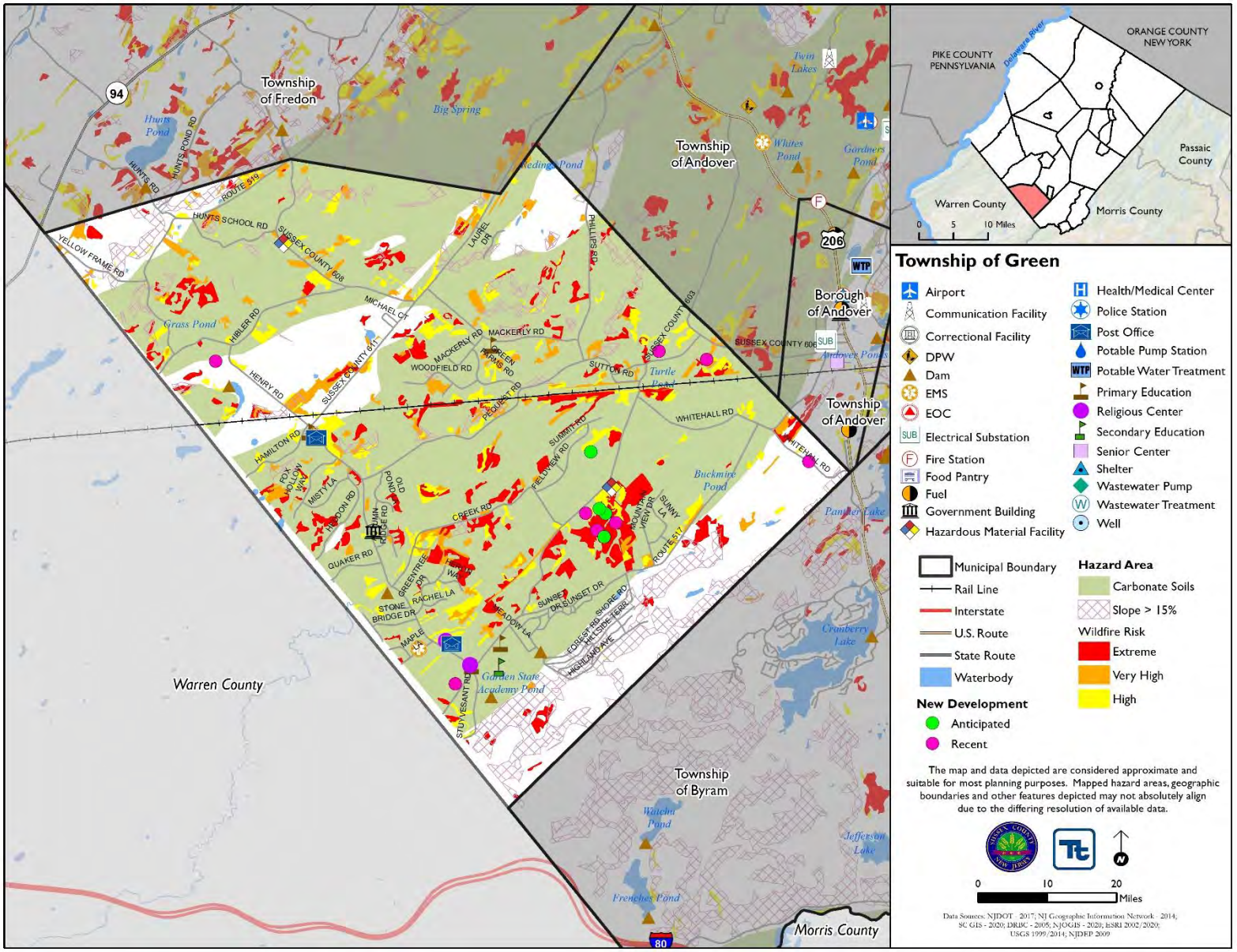


Figure 9.9-3 Township of Green Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Whitehall Road Roadway Elevation		
Project Number:	2021-Green-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Road flooding on Whitehall Road near Washers Pond restricts normal travel and greatly effects emergency access. During Hurricane Irene the road surface was covered for months by six feet of water. In high rain years the roadway is partially flooded also creating a driving hazard.		
Action or Project Intended for Implementation			
Description of the Solution:	A four hundred- and fifty-foot (450') section of the road will need to reconstructed. The area of flooding will need to be raised approximately eighteen inches (18") to mitigate the semi-annual flooding. The slope along Washers Pond will require grading and a guide rail needs to be replaced.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	18" elevation	**Estimated Benefits (losses avoided):**	Reduction in roadway flooding
Useful Life:	50 years	**Goals Met:**	3
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 2 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, Municipal budget
Responsible Organization:	Engineer, Roads Department	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation planning
Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Remove flood prone roadway	N/A	Loss of access to neighborhoods, increased emergency risk
	Buyout properties that exist along flood prone roadways	$Tens of Millions	Costly, loss of large portion of community
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Evaluation and Prioritization		
Project Name:	Whitehall Road Roadway Elevation	
Project Number:	2021-Green-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect emergency access
Property Protection	1	Project will protect roadway from flood damage
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Township has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather
Timeline	1	1 year
Agency Champion	1	Engineer, Roads Department
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Lake Tranquility Drainage Study		
Project Number:	2021-Green-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Lake Tranquility properties are inundated with water runoff and ground water.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will conduct drainage study of the entire lake community and determine if actions can be taken to address groundwater flooding in Lake Tranquility. Once actions are identified, the Township will carry out the cost-effective options. A potential action would be to implement a storm water runoff management system for 350 homes in Lake Tranquility area as funding and private cooperation permit. Drainage easements need to be created allowing the Township the authorization to access and maintain.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD	**Estimated Benefits (losses avoided):**	Reduction in flood risk in selected areas
Useful Life:	TBD by drainage study	**Goals Met:**	2, 4, 5
Estimated Cost:	TBD by study	**Mitigation Action Type:**	Local Plans and Regulations, Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	5 years	**Potential Funding Sources:**	HMGP, BRIC, FMA, municipal budget
Responsible Organization:	Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation planning, stormwater planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$200,000 per home	Costly and may not solve problems with access
	Buyout homes	N/A	Costly

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Lake Tranquility Drainage Study	
Project Number:	2021-Green-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	.
Property Protection	1	Reduction in flooding risk
Cost-Effectiveness	0	
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	1	Project would reduce flooding impacts.
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	
Agency Champion	1	Engineering
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	Medium	

Action Worksheet			
Project Name:	Stand Pipes at Draft Sites		
Project Number:	2021-Green-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Hazmat, Wildfire		
Description of the Problem:	Water systems are limited in Green Township therefore the need for a water source to combat fires is paramount. The Township has a lack of stand pipes at draft stations for emergency equipment.		
Action or Project Intended for Implementation			
Description of the Solution:	Additional areas for the installation of a stand pipe or draft stations will be researched and determined. Once the locations are established funding and or easements will need to be secured.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	To be determined	**Estimated Benefits (losses avoided):**	Fire hydrants and water lines maintained for emergency response
Useful Life:	20 years	**Goals Met:**	2
Estimated Cost:	Medium	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	Within 5 years	**Potential Funding Sources:**	HMGP, Township budget
Responsible Organization:	Administrator, OEM Coordinator	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, emergency management
Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Purchase tanker truck for water	$190,000	Slow emergency service response times.
	Develop contract with neighboring towns for fire response	N/A	Too slow of response times, towns may be unable
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Action Worksheet		
Project Name:	Stand Pipes at Draft Sites	
Project Number:	2021-Green-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Emergency response preserved to protect life
Property Protection	1	Emergency response preserved to protect property
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Hazmat, Wildfire
Timeline	0	Within 5 years
Agency Champion	1	Administrator, OEM Coordinator
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Pequest River		
Project Number:	2021-Green-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	The Pequest River experiences streambank erosion.		
Action or Project Intended for Implementation			
Description of the Solution:	Identify areas of the Pequest River where erosion and undermining of the river bank are occurring. Work with the Township Engineer and private land owners in developing plans to stabilize these locations.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Erosion and flood issues reduced
Useful Life:	1 year	**Goals Met:**	1, 2
Estimated Cost:	Medium	**Mitigation Action Type:**	Natural Systems Protection
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, Township budget
Responsible Organization:	Township Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Retreat from areas near Creek	High	Costly, unpopular
	Levees along Creek	High	Not feasible/environmentally damaging, costly

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Pequest River	
Project Number:	2021-Green-005	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Project will protect properties from potential flood damage
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	0	Permitting likely required
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	
Agency Champion	1	Administration
Other Community Objectives	1	Restore natural floodplain function
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Hunts School Road		
Project Number:	2021-Green-008		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Hunts School Road has an undersized drainage pipe that contributes to flooding.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township Public Works Department will determine the proper size needed to adequately service Hunts School Road and will then replace and upsize the drainage pipe.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD by size selected	**Estimated Benefits (losses avoided):**	Reduction in flood risk
Useful Life:	30 years	**Goals Met:**	2
Estimated Cost:	$75,000	**Mitigation Action Type:**	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	6 months	**Potential Funding Sources:**	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate roadway	$500,000	Costly and may not solve problem
	Relocate roadway	N/A	Not possible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Hunts School Road	
Project Number:	2021-Green-008	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protects life from flooding.
Property Protection	1	Protects culvert from flood damage
Cost-Effectiveness	0	
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would reduce flooding impacts
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	Within 5 years
Agency Champion	1	DPW
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Post Office Backup Power		
Project Number:	2021-Green-009		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. The Tranquility Post Office and the Greendell Post Office lack backup power. The Township owns both properties.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will consider the installation of backup generators at each site. The Engineer will research what size generator is needed to power the facilities. The Township will then purchase and install the selected generator and necessary electrical components to supply backup power to the facilities.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of Post Office
Useful Life:	20 years	**Goals Met:**	2, 6
Estimated Cost:	$50,000 per generator	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	OEM, Engineer, Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Post Office Backup Power	
Project Number:	2021-Green-009	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Post Offices
Property Protection	1	Project will protect buildings from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	OEM, Engineer, Administration
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

9.10 BOROUGH OF HAMBURG

This section presents the jurisdictional annex for the Borough of Hamburg. The annex includes a general overview of the Borough of Hamburg; an assessment of the Borough of Hamburg's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.10.1 Hazard Mitigation Planning Team

The Borough of Hamburg followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.10-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Keith Sukennikoff, OEM Coordinator Address: 16 Wallkill Avenue, Hamburg, NJ 07419 Phone Number: (973) 670-0105 Email: oem@hamburgnj.org	Name / Title: Michael Postorino, Public Safety/Police Director Address: 16 Wallkill Avenue, Hamburg, NJ 07419 Phone Number: (973) 827-9230 Email: mpostorino@hamburgpolice.org
NFIP Floodplain Administrator	
Name / Title: John Ruschke, Borough Engineer Address: 412 Mt. Kemble Avenue, Suite G22 Morristown NJ 07960 Phone Number: (973) 827-9230 Email: John.ruschke@mottmac.com	

Name	Title	Method of Participation
John Ruschke, PE & Samantha Anello, PE	Borough Engineer	NFIP, floodplain managers, contributed to the mitigation strategies, reviewed annex. John attended the kickoff meeting. Samantha attended the risk assessment meeting and mitigation strategy workshop.
Keith Sukennikoff	OEM Coordinator	Primary point of contact; attended the kickoff meeting
Michael Postorino	Public Safety/Police Director	Alternate point of contact

9.10.2 Jurisdiction Profile

The Borough of Hamburg is located in northern Sussex County. It is bordered to the north, east and west by the Township of Hardyston and to the south by the Borough of Franklin. The Borough covers an area of approximately 1.2 square miles. A tributary of the Wallkill River flows through the northern section of the Borough and along the Wallkill River forms the western border between the Borough and Township of Hardyston. Hamburg Creek is located in the southern end of the Borough. Hardistonville is an unincorporated area of the Borough.

According to the U.S. Census, the 2010 population for the Borough of Hamburg was 3,277. The estimated 2018 population was 3,152, a 3.8 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 4.2 percent of the population is 5 years of age or younger and 15.4 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.10.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.9-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.10-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	0	0	0	0	0	0	0	0	0	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0	0	0	0	0	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
Fairways at Wallkill	Residential	68	G/B Castle Road Block 11 Lot 30 and Block 11.01 Lot 1	1% and 0.2% Flood Hazard Areas, Railway Incident Hazard Area, Hazardous Material Incident Area, Nuclear Incident Hazard Area, Carbonate Soil, Steep Slopes, Wildfire	Ongoing
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None anticipated					

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.10.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Borough of Hamburg performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Borough of Hamburg identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Borough of Hamburg and where hazard mitigation has been integrated.

Table 9.10-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *This code follows State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Zoning Department is responsible for this code in compliance with Chapter 215.*					
Subdivisions	Yes	Local	Yes – if municipality has a	Yes	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans? If yes- how? Describe in comments.	Have aspects of the HMP been integrated into your codes/ordinances/plans? If no - add Mitigation Action #, if applicable.
			Planning Board		
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The LUB is responsible for this ordinance in compliance with Chapter 186.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The LUB is responsible for this ordinance in compliance with Chapter 182.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	Yes – if municipality has a Planning Board	-	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The LUB is responsible for these requirements in compliance with Chapter 171.*					
Environmental Protection	Yes	State	No	Yes	-
Comment: *Chapter 215-20 of the Hamburg Code regulates development in critical areas. According to the code, all open water, streams, ponds, detention basins, wetlands as defined on the Army Corps of Engineers' wetlands survey and floodplains shall be excluded from the land area used by an applicant for development in the calculation of permitted densities for construction.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans? If yes- how? Describe in comments.	Have aspects of the HMP been integrated into your codes/ordinances/plans? If no - add Mitigation Action #, if applicable.
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	-
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Construction Official is responsible for this ordinance in compliance with Chapter 215-20.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	Yes	State and Local	No	No	-
Comment: • *Chapter 20 Fire Department* • *Chapter 44 Police Department*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other: Municipal Separate Storm Sewer System (MS4)	Yes	Local	No	Yes	-
Comment: *The DPW is responsible for this ordinance in compliance with Chapter 182.*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The LUB is responsible for this plan. The plan was adopted in 1997 and a re-examination report was completed in November of 2006.*					
Capital Improvement Plan	No	-	No	-	-
Comment:					
Disaster Debris Management Plan	No	-	No	-	2020-Hamburg-006
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans? If yes- how? Describe in comments.	Have aspects of the HMP been integrated into your codes/ordinances/plans? If no - add Mitigation Action #, if applicable.
Comment:					
Stormwater Management Plan	Yes	Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *This plan was adopted on April 20,2005.* • *The MC is responsible for this plan in compliance with Chapter 182.*					
Stormwater Pollution Prevention Plan	No	-	No	-	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.* • *Hamburg is a Tier B community and a Stormwater Pollution Prevention Plan is not required.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	No	-	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans? If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other: Open Space Plan	Yes	Local	No	No	-
Comment: • *This plan was adopted on June 24, 2003.* • *The MC is responsible for this plan in compliance with Chapter 215.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *This plan was adopted in 2010, updated in March 2019, and approved by the New Jersey State Police.* • *The Office of Emergency Management is responsible for this plan.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	Yes	County	Yes	-	-
Comment: *There is a public health plan within the Emergency Operations Plan and is subject to the jurisdiction of the Sussex County Health Department.*					
Other	No	-	No	-	-
Comment:					

Table 9.10-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Construction Department
Does your jurisdiction have the ability to track permits by hazard area?	Yes, the Borough has access to the County GIS system
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Borough of Hamburg.

Table 9.10-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Lane Use Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	No	-
Open Space Board / Committee	Yes	Land Use Board, Recreation Commission
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	No	-
Maintenance program to reduce risk	No	-
Mutual aid agreements	Yes	Mayor and Council
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Mayor and Council
Engineers or professionals trained in building or infrastructure construction practices	Yes	Mayor and Council
Planners or engineers with an understanding of natural hazards	Yes	Mayor and Council
Staff with training in benefit/cost analysis	Yes	Engineer
Staff with training in green infrastructure	Yes	Engineer
Staff with education/knowledge/training in low impact development	Yes	Engineer
Surveyor	Yes	Mayor and Council
Stormwater engineer	Yes	Engineer
Personnel skilled or trained in GIS applications	Yes	Mayor and Council
Local or state water quality professional	Yes	John Perry-
Scientist familiar with natural hazards in local area	Yes	Mayor and Council
Emergency manager	Yes	Mayor and Council
Watershed planner	No	-
Environmental specialist	Yes	Engineer
Grant writers	Yes	Jeff Stevens
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Construction Official, Engineer

Fiscal Capability

The table below summarizes financial resources available to the Borough of Hamburg.

Table 9.10-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes

Financial Resource	Accessible or Eligible to Use?
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Hamburg.

Table 9.10-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	No
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	No

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Hamburg.

Table 9.10-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	Hardyston Building Department	Hardyston Building Department
Public Protection (Fire ISO Protection Class)	Yes	Hardyston Building Department	Hardyston Building Department
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words,

it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.10-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Weak
Disease Outbreak	Weak
Drought	Moderate
Earthquake	Weak
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Moderate
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.10-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering
Who is your floodplain administrator? (name, department/position)	John Ruschke, PE, CFM – Borough Engineer; Samantha Anello, PE, CFM - Engineering
Are any certified floodplain managers on staff in your jurisdiction?	Yes - John Ruschke, PE, CFM – Borough Engineer; Samantha Anello, PE, CFM - Engineering
What is the date that your flood damage prevention ordinance was last amended?	August 2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements.
When was the most recent Community Assistance Visit or Community Assistance Contact?	December 7, 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction?	No

Criterion	Response
If so, state what they are.	
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA would consider attending continuing education and/or certification training on floodplain management if offered.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	4 policies
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	0 claims or payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	Not currently

According to FEMA statistics as of October 13, 2020
Reference: FEMA 2020

Opportunities for Future Integration

- **Disaster Debris Management Plan:** The Borough will develop a Disaster Debris Management Plan (2020-Hamburg-006).

9.10.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Borough of Hamburg's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.9-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.10-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Weather and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Although the County was impacted, the Borough did not report damages.
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	The Borough was subject to closures and social distance and masking mandates.

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
2020	Rainstorm	No	Large storm event resulted in significant wash out at the Limekiln road culvert in 2020. Resulted	The Borough incurred costs for DPW overtime to clean-up

Source: FEMA 2020, NOAA NCEI 2020

9.10.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Borough of Hamburg risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Hamburg that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Hamburg has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Hamburg.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.10-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
Wheatsworth Mill #1 Dam	Dam	X	X
Wheatsworth Mill #2 Dam	Dam	X	X

Source: Sussex County Planning Partnership 2020

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The Borough has noted that dams in Hamburg need to be brought into compliance with NJDEP requirements. Currently, there are no Emergency Action Plans in place.

- The Borough has reported the need to install a backup generator at the Hamburg Elementary School and to install portable generators to deploy on an as-needed basis.
- Limekiln Road has been identified as having undersized culverts that result in periodic road flooding.
- North Governor Haines Street has been identified as being a drainage problem area.
- The Borough has identified inflow/infiltration issues with Hamburg's water/sewer system and proposes monitoring and remedies to manage the issue.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Borough of Hamburg ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Borough of Hamburg. The Borough of Hamburg has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Borough of Hamburg indicated the following reasons why hazard rankings have changed since the 2016 HMP:

- In 2016, the Dam Failure ranking was listed as high. In the initial 2020 risk assessment, the hazard was ranked low. The Borough requested that the ranking should be changed to high to reflect the lack of evidence for existing dams' compliance and the lack of an Emergency Action Plan.

Table 9.10-13. Borough of Hamburg Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
High	Medium	Medium	Low	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.10.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.9-15 and Table 9.9-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.10-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Hamburg-1 (old #1)	Backup generator for shelter at Hamburg Elementary School located on Linwood Avenue.	OEM Coordinator	No Progress	X	2021-Hamburg-001
Hamburg-2 (old #2)	Retrofit roof to meet current snow load standards on Hamburg Elementary School located on Linwood Avenue.	School Administrator, Municipal Engineer	In-Progress, 50% complete	X	2021-Hamburg-002
Hamburg-3 (revised old #4)	Develop, implement, and facilitate a multi-hazard public awareness program. Provide information on all types of hazards, preparedness and mitigation measures via the Borough website and social media.	OEM Coordinator, in coordination with SCDEM	No Progress	X	2021-Hamburg-003
Hamburg-4 (new)	Multi-purpose emergency vehicle to support highways	Borough OEM	No Progress	X	2021-Hamburg-004
Hamburg-5 (new)	Purchase Bobcat Skid-Steer to use during debris cleanup operations and post-hazard events.	Borough DPW	No Progress	X	2021-Hamburg-005
Hamburg-6 (new)	Create and maintain a plan for adequate road and debris clearing capabilities within the Borough.	Borough DPW	No Progress	X	2021-Hamburg-006
Hamburg-7 (new)	Purchase portable generator for critical facilities	Municipal Engineer, OEM Coordinator	No Progress	X	2021-Hamburg-007
Hamburg-8 (new)	Utilize the Hazard Mitigation Plan (HMP) when updating the Comprehensive Master Plan; consider including hazard identification, hazard zones risk assessment information, and hazard mitigation goals as identified in the HMP. Further, the findings and recommendation of the HMP will be considered during any future site plan review processes.	Planning	No Progress	X	2021-Hamburg-008
Hamburg-9 (new)	During the Borough's rezoning procedures or update of the zoning ordinance, the Borough will recognize hazard areas as limits on changes to zoning within the municipality.	Borough Administration	No Progress	X	2021-Hamburg-009
Hamburg-10 (new)	Prepare and enforce a fire plan for the Borough and recognize the existence of wildfire	OEM Coordinator	No Progress	X	2021-Hamburg-010

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
	hazards and identify risk areas based on a vulnerability assessment.				
Hamburg-11 (new)	The Borough will work with local school districts and assist with community service projects regarding hazards and mitigation.	OEM Coordinator	No Progress	X	2021-Hamburg-011
Hamburg-12 (new)	Catch Basin & General Stormwater Facility Maintenance: The continual maintenance of catch basins and stormwater facilities is critical especially before and after large storm events	Borough DPW and Engineer	On Going Capability	X	2021-Hamburg-012
Hamburg-13 (new)	Sanitary Sewer Reinforcement: Perform a study to determine where sanitary sewer reinforcement is needed due to most imminent threats of failure or cracking.	Borough Engineer	No Progress	X	2021-Hamburg-013
Hamburg-14 (new)	Tree Removal and Maintenance in the Vicinity of Power Lines: Tree removal and maintenance in the vicinity of power lines will help minimize power outages during Severe Weather events.	Borough DPW	Ongoing	X	2021-Hamburg-014

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Hamburg participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Hamburg participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.9-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Hamburg would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and

the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.9-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.10-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Hamburg-001	Generator Installation	**Problem:** The Hamburg Elementary School does not have a backup generator to power the facility during a power outage. Because the facility is used as a shelter for the municipality, it is critical to install a generator to power the facility to be used during hazard events. **Solution:** Install 3 phase backup generator for shelter at Hamburg Elementary School located on Linwood Avenue. The Borough Engineer and the school maintenance crew shall work together to purchase and install the generator.	New	Flood, Severe Weather, Severe Winter Weather	1, 2, 3, 5, 6	OEM Coordinator	HMGP, Municipal Budget	Continued Operation	150k	1 year	Medium	SIP	PP, PR, ES
2021-Hamburg-002	Roof Upgrade	**Problem:** The roof of the Hamburg Elementary	Existing	Severe Winter Weather	1, 2, 5	School Administrator, Municipal Engineer	Municipal Budget, School Budget	Structural Mitigation	Medium	1 year	Medium	SIP	PR, ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		School cannot handle the snow load that accumulates during severe snowstorms. **Solution:** Retrofit roof to meet current snow load standards on Hamburg Elementary School located on Linwood Avenue.											
2021-Hamburg-003	Multi-Hazard Public Awareness Program	**Problem:** There is a lack of knowledge around hazard mitigation in the region and residents are underprepared for potential natural hazard events **Solution:** Develop, implement, and facilitate a multi-hazard public awareness program. Provide information on all types of hazards, preparedness and mitigation measures via the Borough	New	All Hazards	1, 2, 3, 4, 5, 6	OEM Coordinator, in coordination with SCDEM	Municipal Budget	Preparedness and Increase Public Knowledge	Low	5 years	Medium	EAP	PR, PI

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		website and social media.											
2021-Hamburg-004	Purchase Emergency vehicle	**Problem:** The municipality does not have an emergency vehicle to support highway and issues related to road closures and issues related to severe weather. Additional vehicles will increase capacity and overall response. **Solution:** The Municipality shall purchase a multi-purpose emergency vehicle to support highways.	New	All Hazards	3, 5, 6	Borough OEM	Municipal Budget, HMGP,	Increased Capacity	Low	5 year	Medium	SIP	PP, ES
2021-Hamburg-005	Purchase Bobcat Skid-Steer	**Problem:** The municipality struggles to keep up with debris cleanup operation immediately after storm events. This could cause significant issues around subsequent flooding due to clogging of roadways and waterbodies.	New	Severe Weather, Flood	1, 2, 4, 5	Borough DPW	Municipal Budget, HMGP, New Jersey Department of Transportation – Local Aid Program	Increased capability	Medium	1 year	Medium	SIP	PR, PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		Solution: Purchase Bobcat Skid-Steer to use during debris cleanup operations and post-hazard events.											
2021-Hamburg-006	Develop Disaster Debris Management Plan	**Problem:** The municipality has not developed a comprehensive strategy to address debris clearing during and after a hazard event. **Solution:** Create and maintain a plan for adequate road and debris clearing capabilities within the Borough.	New	All Hazards	1, 2, 4, 5	Borough DPW	Municipal Budget	Streamlined Response	Low	1 year	High	LPR	ES
2021-Hamburg-007	Portable Generator	**Problem:** Not all critical facilities have backup power. **Solution:** Purchase portable generators for critical facilities that can be used to power the bare essentials during a hazard event	New	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather	1, 2, 3, 5	Municipal Engineer, OEM Coordinator	HMGP	Continued Operation	Low	1 year	Medium	LPR	PR
2021-Hamburg-008	HMP Implementation	**Problem:** The municipality has previously not been successful	Existing	All	1, 2, 3, 4, 5, 6, 7	Planning	Municipal Budget	Enhanced Planning	Low	5 years	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		in implementing hazard mitigation actions within the municipality. **Solution:** Utilize the Hazard Mitigation Plan (HMP) when updating the Comprehensive Master Plan; consider including hazard identification, hazard zones risk assessment information, and hazard mitigation goals as identified in the HMP. Further, the findings and recommendation of the HMP will be considered during any future site plan review processes.											
2021-Hamburg-009	Hazard Area Identification and Plan Implementation	**Problem:** The municipality has previously not been successful in identifying potential hazard areas within the municipality. **Solution:** During the Borough's	Existing	All	1, 2, 3, 4, 5, 6, 7	Borough Administration	Municipal Budget as Needed	Hazard Mitigation	Low	5 years and longer	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		rezoning procedures or update of the zoning ordinance, the Borough will recognize hazard areas as limits on changes to zoning within the municipality.											
2021-Hamburg-010	Fire Plan Implementation	**Problem:** The municipality has previously not been successful in implementing the municipal fire plan proposed actions. **Solution:** Prepare and enforce a fire plan for the Borough and recognize the existence of wildfire hazards and identify risk areas based on a vulnerability assessment.	Existing	All	1, 2, 3, 4, 5, 6, 7	OEM Coordinator	Municipal Budget as Needed	All	Low	5 years and longer	High	LPR	PR
2021-Hamburg-011	Local School Districts HMP Implementation	**Problem:** The municipality has previously not been able to successfully implement hazard mitigation actions in coordination	Existing	All	1, 2, 3, 4, 5, 6, 7	OEM Coordinator	Municipal Budget as Needed	HMP Integration	Low	5 years	Medium	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		with the local school districts. **Solution:** The Borough will work with local school districts and assist with community service projects regarding hazards and mitigation.											
2021-Hamburg-012	Stormwater Maintenance Program	**Problem:** The municipality has previously had trouble around stormwater infrastructure maintenance capabilities **Solution:** The municipality would like to increase maintenance capabilities of catch basins and stormwater facilities is critical especially before and after large storm events. The municipality can do this by developing a program that can be coordinated with other municipalities to facilitate the maintained of	New	Flood, Severe Weathers	1, 2, 3, 5	Borough DPW and Engineer	HMGP, BRIC Municipal Budget as needed; New Jersey Water Bank; Environmental Infrastructure Financing Program	Increased organized capacity	Low	5 years	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		local stormwater infrastructure.											
2021-Hamburg-013	Reinforcements	**Problem:** The Sewer Sanitary Facility has been having issues around building cracking which has led to the threat of potential disrupted operation of the critical service. **Solution:** Sanitary Sewer Reinforcement: Perform a study to determine where sanitary sewer reinforcement is needed due to most imminent threats of failure or cracking.	New	Flood, Severe Weather	1, 2, 3, 5	Borough Engineer	HMGP, Municipal Budget	Fix Structure disrepairs	Low	2 years	Medium	SIP	SP
2021-Hamburg-014	Tree Maintenance	**Problem:** In previous years, the municipality has experienced accidents around tree falling and disrupting the utility lines, subsequently causing power outages. The Borough is now on the power company's tree trimming program which	New	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather	1, 2, 3, 4, 5	Borough DPW	HMGP, Municipal Budget	Better Tree Maintenance	High	2 years	Medium	LPR SP,	PP, NR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		is implemented every three years. **Solution:** Tree Removal and Maintenance in the Vicinity of Power Lines: Tree removal and maintenance in the vicinity of power lines will help minimize power outages during Severe Weather events. The municipality work with the County to develop strategy to conduct tree maintenance.											
2021-Hamburg-015	Hamburg Borough Building Code Update	**Problem**: Building Codes need to be periodically reviewed for updates to keep up with changing regulations and reduce hazard risks **Solution: P**erform periodical building code reviews and make updates as required	Existing	All Hazards	1	Construction Code Official	N/A – Staff Time	Low	Low	Ongoing	High	LPR	PR/ PP
	Evaluation of Bridges and	**Problem**: Aged Infrastructure	Existing	Flood/Severe Weather	1	Borough Administration	Borough	High	High	Short	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Hamburg-016	Other River Structures	**Solution:** A comprehensive master plan should be developed for appropriate sizing of the bridge openings and setting road elevations to provide maximum benefits as the bridges are eventually replaced over time.				, Township Engineer							
2021-Hamburg-017	Hazard Warning System	**Problem**: Hazard warning systems need to be developed. **Solution:** The hazard warning system resources available to the Township should be reviewed and utilized.	Existing	All Hazards	1, 2, 3, 4	Borough Administration, Township Engineer	Borough	High	Low	Short	High	EAP	PI
2021-Hamburg-018	Stream Cleaning & Maintenance	**Problem**: The required removal of built-up debris and sediment/silt buildup within streams and rivers. Bridge openings must be maintained. **Solution:** Removal of debris,	Existing	Flood, Severe Weather, Severe Winter Weather	1, 3	Borough Administration, Township Engineer	Borough; Capital Improvements	High	Low	Short – Annual Basis	High	NSP	PR, PP, NR, SP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		sediment, and silt from the channel as well as bridge openings by volunteer groups and outside contractors when needed.											
2021-Hamburg-019	GIS Mapping of Catch Basin & General Stormwater Facilities	**Problem**: The location of all catch basins and stormwater facilities, both private and public, need to be identified, mapped, and located for planning and maintenance **Solution:** Create a GIS mapping system of catch basins, stormwater facilities, basins, culverts, and other drainage features and structures	Existing	Flood, Severe Weather	1	Borough Administration, Township Engineer DPW Supervisor	Borough, PDM	High	Low	Short	High	NSP, SIP	PR, PP
2021-Hamburg-020	Dam project	**Problem:** No evidence of existing dams being in compliance with Dam Safety Requirements; No Emergency Action Plan for Dam failure. **Solution:** The Borough will	Existing	Dam Failure	7	Administration, Dam owners	Borough budget	Dams brought into compliance with NJDEP Dam Safety Requirements	Staff time	1 year	High	EAP	PI

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		work with dam owners to gain copies of Emergency Action Plans or instruct them to develop Plan in conjunction with NJDEP.											
2021-Hamburg-021	North Governor Haines Street Drainage	**Problem:** North Governor Haines Street experiences drainage issues. **Solution:** The Borough will conduct a feasibility study for North Governor Haines Street drainage issues. If cost-effective measures are identified, the Borough will pursue grant funding and implement the selected actions.	Existing	Flood, Severe Weather	2	Engineer, DPW	HMGP, BRIC, municipal budget	Reduction in flood risk	$200,000	Within 5 years	High	SIP	SP
2021-amburg-022	Limekiln Road Drainage Improvement Project	**Problem:** Existing Culvert does not have adequate capacity. Results in flooding on roadway and near Pump Station **Solution:** Culvert and drainage	Existing	Flood, Severe Weather	2	Engineering	HMGP, BRIC, Municipal Budget	Reduction in Flood Risk	$500,000	Within 5 years	High	SIP	SP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		channel improvements are required to pass required capacity.											

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

BRIC	*Building Resilient Infrastructure and Communities*
FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.10-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Hamburg-001	Backup generator for shelter at Hamburg Elementary School located on Linwood Avenue.	0	0	1	0	0	0	0	0	1	1	1	1	1	1	7	Medium
2021-Hamburg-002	Retrofit roof to meet current snow load standards on Hamburg Elementary School located on Linwood Avenue.	1	1	1	1	0	0	0	0	0	0	1	1	1	1	7	Medium
2021-Hamburg-003	Develop, implement, and facilitate a multi-hazard public awareness program. Provide information on all types of hazards, preparedness and mitigation measures via the Borough website and social media.	0	0	1	1	0	0	0	0	0	1	1	1	1	0	6	Medium
2021-Hamburg-004	Multi-purpose emergency vehicle to support highways	1	0	1	0	0	0	1	0	0	1	1	1	1	1	8	Medium
2021-Hamburg-005	Purchase Bobcat Skid-Steer to use during debris cleanup operations and post-hazard events.	1	0	1	0	0	0	1	0	0	1	1	1	1	1	8	Medium
2021-Hamburg-006	Create and maintain a plan for adequate road and debris clearing capabilities within the Borough.	1	1	1	1	0	0	0	0	0	1	1	1	1	1	9	High

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Hamburg-007	Purchase portable generator for critical facilities	0	0	1	0	0	0	0	0	1	1	1	1	1	1	7	Medium
2021-Hamburg-008	Utilize the Hazard Mitigation Plan (HMP) when updating the Comprehensive Master Plan; consider including hazard identification, hazard zones risk assessment information, and hazard mitigation goals as identified in the HMP. Further, the findings and recommendation of the HMP will be considered during any future site plan review processes.	1	1	1	1	1	0	0	0	0	1	1	1	1	1	10	High
2021-Hamburg-009	During the Borough's rezoning procedures or update of the zoning ordinance, the Borough will recognize hazard areas as limits on changes to zoning within the municipality.	1	1	1	1	1	0	0	0	0	1	1	1	1	1	10	High
2021-Hamburg-010	Prepare and enforce a fire plan for the Borough and recognize the existence of wildfire hazards and identify	1	1	1	1	1	0	0	0	0	1	1	1	1	1	10	High

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
	risk areas based on a vulnerability assessment.																
2021-Hamburg-011	The Borough will work with local school districts and assist with community service projects regarding hazards and mitigation.	0	0	1	1	0	0	0	0	0	1	1	1	1	0	6	Medium
2021-Hamburg-012	Catch Basin & General Stormwater Facility Maintenance: The continual maintenance of catch basins and stormwater facilities is critical especially before and after large storm events	0	1	1	0	0	0	0	1	1	1	1	1	1	1	9	High
2021-Hamburg-013	Sanitary Sewer Reinforcement: Perform a study to determine where sanitary sewer reinforcement is needed due to most imminent threats of failure or cracking.	0	1	1	1	0	0	0	0	0	1	0	1	1	1	7	Medium
2021-Hamburg-014	Tree Removal and Maintenance in the Vicinity of Power Lines: Tree removal and maintenance in the vicinity of power lines will help minimize power	0	1	1	0	0	0	0	1	1	1	0	1	1	1	8	Medium

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
	outages during Severe Weather events.																
2021-Hamburg-015	Hamburg Borough Building Code Update	0	1	1	1	0	1	0	0	0	1	1	1	1	0	8	Medium
2021-Hamburg-016	Evaluation of Bridges and Other River Structures	1	1	1	1	0	0	0	1	0	1	1	1	0	1	9	High
2021-Hamburg-017	Hazard Warning System	1	0	1	0	0	1	1	0	1	1	1	0	1	1	9	High
2021-Hamburg-018	Stream Cleaning & Maintenance	0	1	1	0	0	0	0	1	1	1	1	1	1	1	9	High
2021-Hamburg-019	GIS Mapping of Catch Basin & General Stormwater Facilities	0	0	1	1	0	0	0	1	1	1	1	1	1	1	9	High ⚠
2021-Hamburg-020	Dam project	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2021-Hamburg-021	North Governor Haines Street Drainage	0	1	0	1	1	1	0	1	0	1	1	0	1	1	9	High ⚠
2021-Hamburg-022	Limekiln Road Drainage Improvement Project	1	1	0	1	1	1	0	1	0	1	1	0	1	1	10	High ⚠

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.10-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure	X	X	X		X			X
Disease Outbreak	X	X	X		X			X
Drought	X	X	X		X			X
Earthquake	X	X	X		X			X
Flood	X	X	X	X	X	X		X
Geologic	X	X	X		X			X
Hazardous Materials	X	X	X		X			X
Hurricane and Tropical Storm	X	X	X		X			X
Invasive Species	X	X	X		X			X
Nor'Easter	X	X	X		X			X
Severe Weather	X	X	X	X	X	X		X
Severe Winter Weather	X	X	X	X	X			X
Wildfire	X	X	X		X			X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.10-1. Borough of Hamburg Hazard Area Extent and Location Map 1

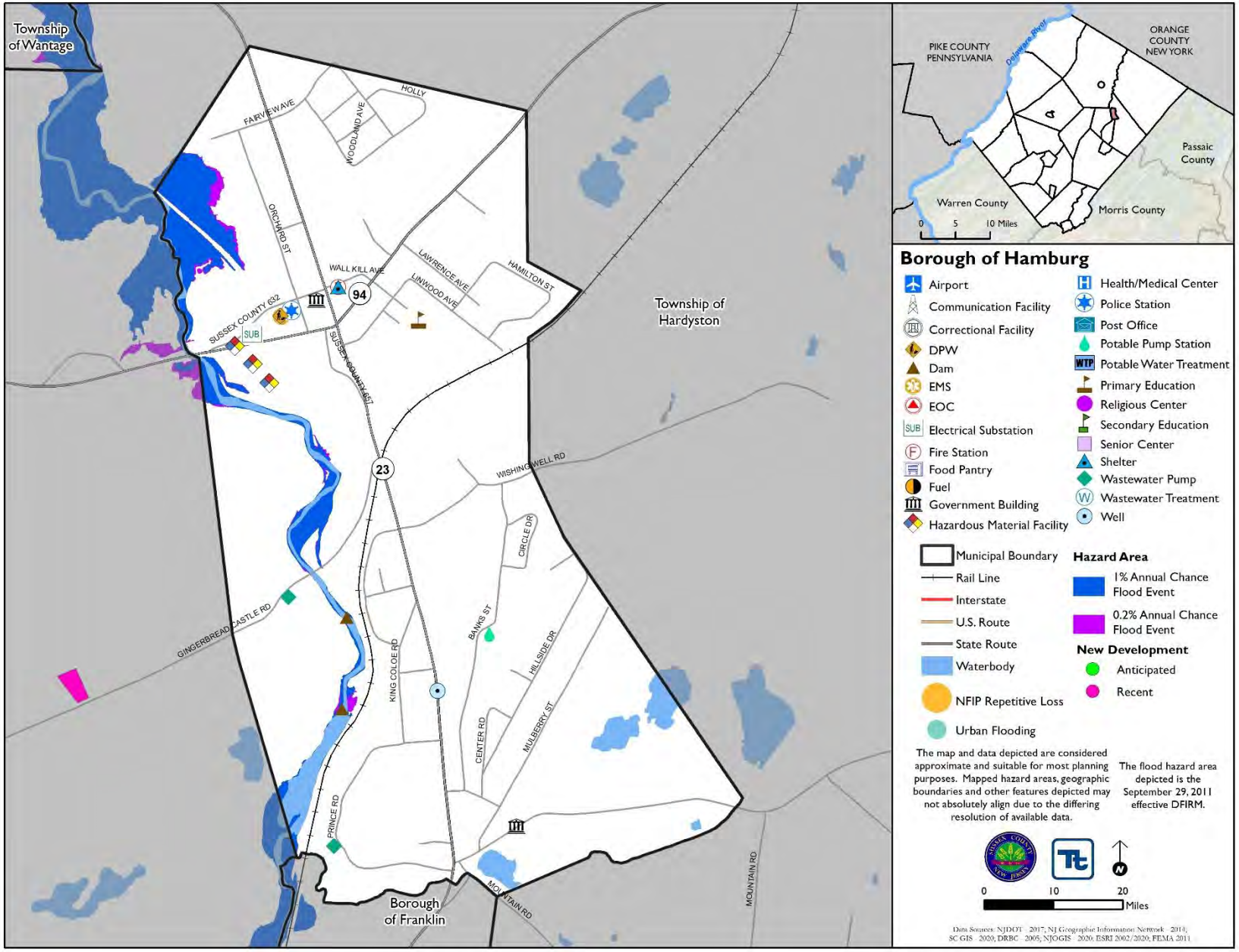


Figure 9.10-2. Borough of Hamburg Hazard Area Extent and Location Map 2

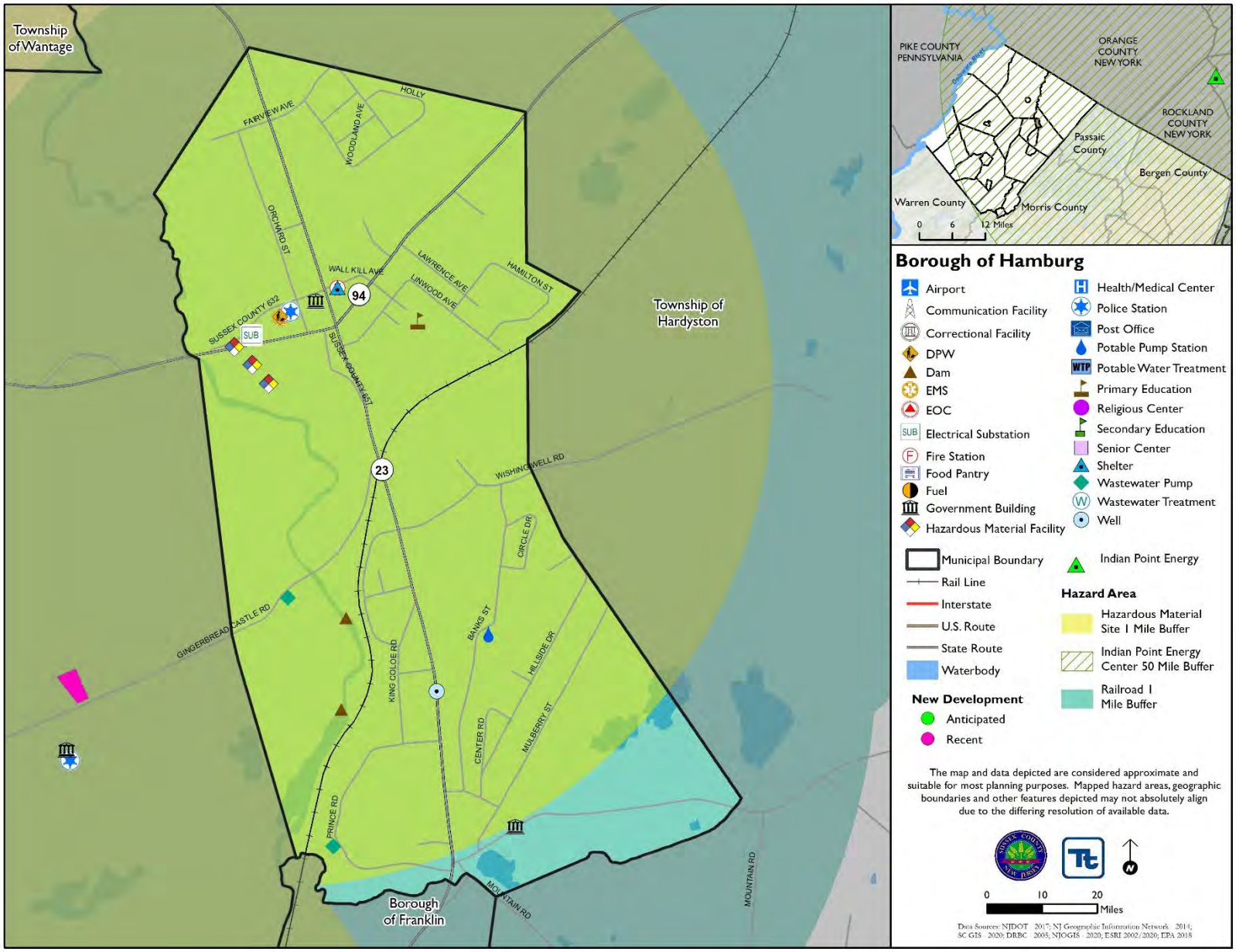
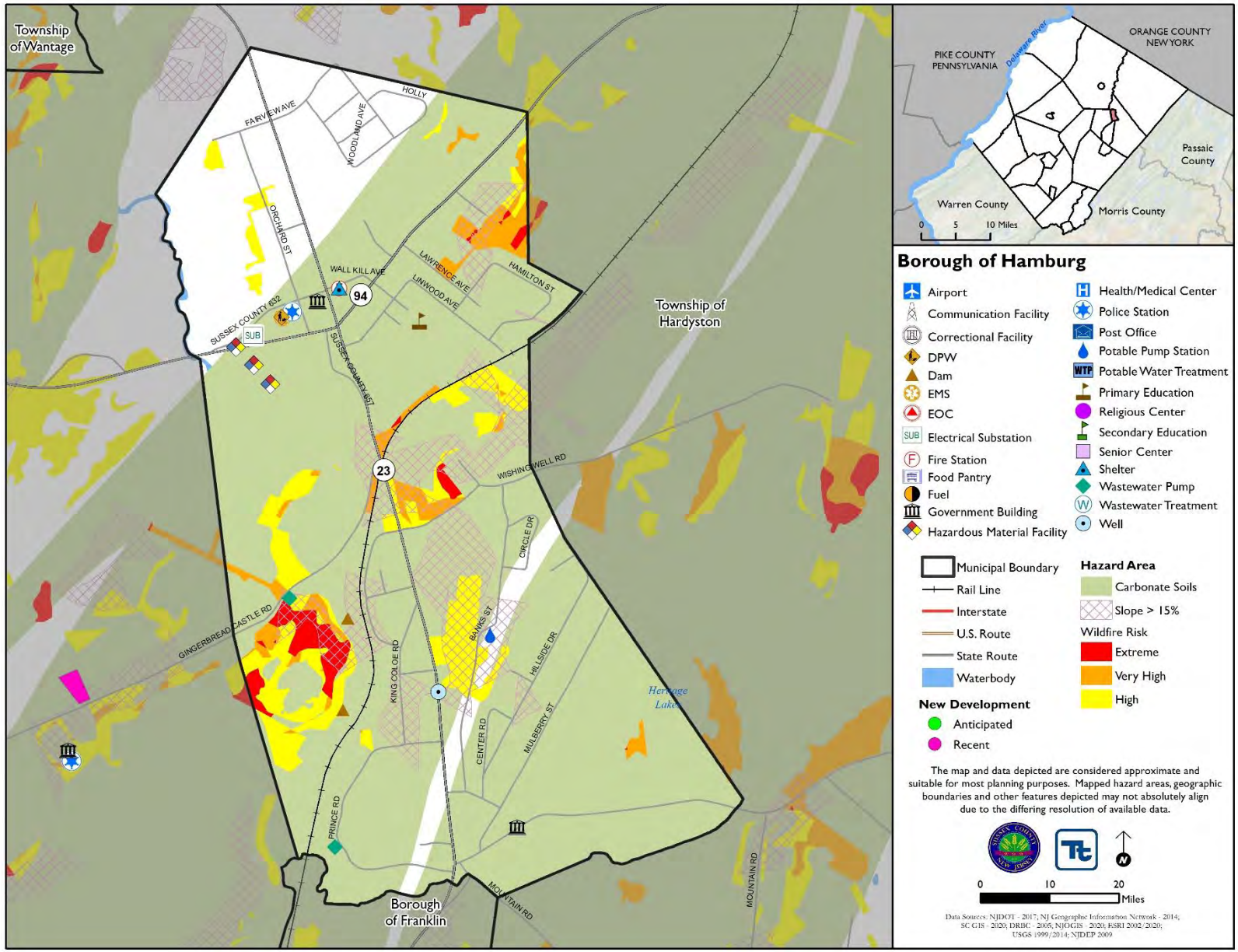


Figure 9.10-3 Borough of Hamburg Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Generator Installation		
Project Number:	2020-Hamburg-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather, Severe Winter Weather		
Description of the Problem:	The Hamburg Elementary School does not have a backup generator to power the facility during a power outage. Because the facility is used as a shelter for the municipality, it is critical to install a generator to power the facility to be used during hazard events.		
Action or Project Intended for Implementation			
Description of the Solution:	Install 3 phase backup generator for shelter at Hamburg Elementary School located on Linwood Avenue. The Borough Engineer and the school maintenance crew shall work together to purchase and install the generator.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	500-year storm	**Estimated Benefits (losses avoided):**	Continued Operation
Useful Life:	20 years	**Goals Met:**	1, 2, 3, 5, 6
Estimated Cost:	100k	**Mitigation Action Type:**	Structural and Infrastructure Project
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	1 year once funding received
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP
Responsible Organization:	OEM Coordinator	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Install Solar	High	Weather Dependent
	Generator Installation	Medium	Best alternative

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Generator Installation	
Project Number:	2020-Hamburg-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	This project protects life and property
Property Protection	0	This project protects life and property
Cost-Effectiveness	1	
Technical	0	Additional technical resources are needed
Political	0	There are no known political complications
Legal	0	There are no known legal complications
Fiscal	0	Additional funding is needed
Environmental	0	No adverse environmental impacts
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	7	
Priority (High/Med/Low)	Medium	

Action Worksheet			
Project Name:	Purchase Bobcat Skid-Steer		
Project Number:	2020-Hamburg-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather, Severe Winter Weather		
Description of the Problem:	The municipality struggles to keep up with debris cleanup operation immediately after storm events. This could cause significant issues around subsequent flooding due to clogging of roadways and waterbodies.		
Action or Project Intended for Implementation			
Description of the Solution:	Purchase Bobcat Skid-Steer to use during debris cleanup operations and post-hazard events. Details are unknown at this point. The DPW shall determine the size needed for the municipality and coordinate with the municipality on how to raise money to purchase the machinery.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	500-year storm	**Estimated Benefits (losses avoided):**	Continued Operation
Useful Life:	20 years	**Goals Met:**	1, 2, 4, 5
Estimated Cost:	Medium	**Mitigation Action Type:**	Structural and Infrastructure Project
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	1 year once funding received
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, New Jersey Department of Transportation – Local Aid Program, Municipal Budget
Responsible Organization:	Borough DPW	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Hire contractor to conduct any additional work	Low	Low cost but dependent on external aid which might not be fully reliable
	Purchase Bobcat Skid Steer	Medium	Best alternative

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Purchase Bobcat Skid-Steer	
Project Number:	2020-Hamburg-005	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	0	This project protects property
Cost-Effectiveness	1	
Technical	0	Additional technical resources are needed
Political	0	There are no known political complications
Legal	0	There are no known legal complications
Fiscal	1	
Environmental	0	No adverse environmental impacts
Social	0	There are no social effects
Administrative	1	
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	Medium	

Action Worksheet			
Project Name:	Develop Debris Management Plan		
Project Number:	2020-Hamburg-006		
Risk / Vulnerability			
Hazard(s) of Concern:	All Hazards		
Description of the Problem:	The municipality has not developed a comprehensive strategy to address debris clearing during and after a hazard event. As a result, the municipality is unable to respond to debris clearance is a concise and organized manner. While increased capacity would also be beneficial, better organization and coordination of existing resources can also be useful.		
Action or Project Intended for Implementation			
Description of the Solution:	Create and maintain a plan for adequate road and debris clearing capabilities within the Borough. Coordinate with the DPW and County to develop an inventory of existing sites that need constant debris clearance and for repetitive flooded sites that pose constant issues for the municipality, develop relevant mitigation actions. Finally, develop methodologies for addressing debris management after a Severe Weather and areas that require immediate response.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	500-year storm	**Estimated Benefits (losses avoided):**	Streamlined Operations
Useful Life:	5 years	**Goals Met:**	1, 2,4, 5
Estimated Cost:	Medium	**Mitigation Action Type:**	Local Plans and Regulations
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	1 year once funding received
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	Municipal Budget
Responsible Organization:	Borough DPW	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Increase current capacity	High	Would need additional equipment, staff, and larger facility
	Debris management plan	Low	Best solution

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Develop Debris Management Plan	
Project Number:	2020-Hamburg-006	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	0	There might be some political complications
Legal	0	There are potential legal complications
Fiscal	0	Resource needs have not yet been identified
Environmental	0	There are no adverse environmental impacts
Social	0	There are no adverse social impacts
Administrative	1	
Multi-Hazard	1	All Hazards
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Stormwater Maintenance Program		
Project Number:	2020-Hamburg-012		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Flood		
Description of the Problem:	The municipality has previously had trouble around stormwater infrastructure maintenance capabilities and would like to increase its overall capacity.		
Action or Project Intended for Implementation			
Description of the Solution:	The municipality would like to increase maintenance capabilities of catch basins and stormwater facilities is critical especially before and after large storm events. The municipality can do this by developing a program that can be coordinated with other municipalities to facilitate the maintained of local stormwater infrastructure.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	500-year storm	**Estimated Benefits (losses avoided):**	Increased organized capacity
Useful Life:	NA	**Goals Met:**	1, 2, 3, 5
Estimated Cost:	Low	**Mitigation Action Type:**	Local Plans and Regulations
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	1 year once funding received
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC Municipal Budget as needed; New Jersey Water Bank; Environmental Infrastructure Financing Program
Responsible Organization:	Borough DPW and Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Hire contractor to conduct any additional work	Low	Low cost but dependent on external aid which might not be fully reliable
	Purchase Bobcat Skid Steer	Medium	Best alternative

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Stormwater Maintenance Program	
Project Number:	2020-Hamburg-012	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	
Technical	0	Technical issues have not been identified
Political	0	Political issues have not been identified
Legal	0	No legal issues have been identified
Fiscal	0	The exact cost has not yet been identified
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Reinforcements		
Project Number:	2020-Hamburg-013		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Flood		
Description of the Problem:	The Sewer Sanitary Facility has been having issues around building cracking which has led to the threat of potential disrupted operation of the critical service. The facility deals with municipal sewer and therefore needs to be in full operation at all times.		
Action or Project Intended for Implementation			
Description of the Solution:	The municipal DPW shall perform a study to determine where sanitary sewer reinforcement is needed due to most imminent threats of failure or cracking. The DPW and borough engineer could hire a contractor to conduct this assessment and determine the steps that need to be taken.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	500-year storm	**Estimated Benefits (losses avoided):**	Fix Structure disrepairs
Useful Life:	15 years	**Goals Met:**	1, 2, 3, 5
Estimated Cost:	Low	**Mitigation Action Type:**	Structural and Infrastructure Projects
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	1 year once funding received
Estimated Time Required for Project Implementation:	2 years	**Potential Funding Sources:**	HMGP, Municipal Budget
Responsible Organization:	Borough Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Construct a new facility	High	Existing facility needs to be closed
	Reinforcements Study	Low	Best solution

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Reinforcements	
Project Number:	2020-Hamburg-013	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	
Cost-Effectiveness	1	
Technical	0	Technical issues have not been identified
Political	0	Political issues have not been identified
Legal	0	No legal issues have been identified
Fiscal	0	The exact cost has not yet been identified
Environmental	0	No adverse environmental impact
Social	1	
Administrative	0	No known administrative issues
Multi-Hazard	1	
Timeline	1	
Agency Champion	1	
Other Community Objectives	1	
Total	7	
Priority (High/Med/Low)	Medium	

Action Worksheet			
Project Name:	North Governor Haines Street Drainage		
Project Number:	2021-Hamburg-021		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	North Governor Haines Street experiences drainage issues.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will conduct a feasibility study for North Governor Haines Street drainage issues. If cost-effective measures are identified, the Borough will pursue grant funding and implement the selected actions.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD by feasibility study	**Estimated Benefits (losses avoided):**	Reduction in flood risk
Useful Life:	TBD by feasibility study	**Goals Met:**	2
Estimated Cost:	TBD by feasibility study	**Mitigation Action Type:**	Local Plans and Regulations, Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	5 years	**Potential Funding Sources:**	HMGP, BRIC, municipal budget
Responsible Organization:	Engineer, DPW	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation planning, stormwater planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate roadways	$500,000	Costly and may not solve problem
	Relocate roadways	N/A	Not possible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	North Governor Haines Street Drainage	
Project Number:	2021-Hamburg-021	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Reduction in flooding risk
Cost-Effectiveness	0	
Technical	1	Technically feasible project
Political	1	
Legal	1	The Borough has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would reduce flooding impacts.
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	
Agency Champion	1	Engineer, DPW
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	High	

9.11 TOWNSHIP OF HAMPTON

This section presents the jurisdictional annex for the Township of Hampton. The annex includes a general overview of the Township of Hampton; an assessment of the Township of Hampton's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.11.1 Hazard Mitigation Planning Team

The Township of Hampton followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.11-1. Hazard Mitigation Planning Team

Primary Point of Contact		Alternate Point of Contact
Name / Title: Edward Hayes, Township Emergency Management Coordinator Address: 1 Rumsey Way, Newton, NJ 07860 Phone Number: (973) 592-2767 Email: biged5679@yahoo.com		Name / Title: Jessica M. Caruso, Administrator Address: 1 Rumsey Way, Newton, NJ 07860 Phone Number: (973) 383-5570 Email: administrator@hamptontwp-nj.org
NFIP Floodplain Administrator		
Name / Title: Harold E. Pellow, Township Engineer 17 Plains Road, August, NJ 07822 Phone Number: 973-948-6463 Email: hpellow@hpellow.com		
Name	**Title**	**Method of Participation**
Jessica Caruso	Township Administrator	Attended the kickoff meeting, risk assessment meeting and mitigation strategy workshop; provided data and information for annex development
Ed Hayes	OEM Coordinator	Attended the kickoff meeting, annex training, risk assessment meeting and mitigation strategy workshop; provided data and information for annex development
Daniel Bayles	CPWM	Contributed to annex development

9.11.2 Jurisdiction Profile

The Township of Hampton is located in northwestern Sussex County. It has a total area of approximately 25.3 square miles. The Township is bordered to the north by Frankford Township, to the south by Fredon Township and the Town of Newton, to the east by the Townships of Lafayette and Andover, and to the west by the Township of Stillwater. The following unincorporated communities are located within the Township: Crandon Lakes, Myrtle Grove, Balesville, Halsey, and Washingtonville. Numerous ponds and lakes are found throughout the Township. The Paulins Kill flows through the center of the Township. Other streams found in Hampton Township include Troys Brook, Clearview Creek, Swartswood Creek, and smaller tributaries of Paulins Kill.

According to the U.S. Census, the 2010 population for the Township of Hampton was 5,196. The estimated 2018 population was 4,916, a 5.3 percent decrease from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 2.8 percent of the population is 5 years of age or younger and 19.4 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.11.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.10-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.11-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	0	0	1	0	4	0	1	0	3	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0	0	0	0	0	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
None identified.					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None anticipated.					

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.11.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Hampton performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Hampton identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Hampton and where hazard mitigation has been integrated.

Table 9.11-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	No	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Building Department is responsible for this code in compliance with State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Planning Board is responsible for this code in compliance with Chapter 108 of Hampton Township Code.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Planning Board is responsible for this ordinance in compliance with Chapter 85 of Hampton Township Code.*					
Stormwater Management	Yes	State & Local	Yes	No	--
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The Planning Board is responsible for this ordinance in compliance with Chapter 109.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans? If yes- how? Describe in comments.	Have aspects of the HMP been integrated into your codes/ordinances/plans? If no - add Mitigation Action #, if applicable.
Post-Disaster Recovery	No	Local	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	No	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.* • *The Planning Board is responsible for these ordinances in compliance with Chapter 108-53 of Hampton Twp. Code.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Planning Board is responsible for these requirements in compliance with Chapter 85 of Hampton Twp. Code.*					
Environmental Protection	No	Local	No	No	-
Comment:					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	No	--
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Township Engineer is responsible for this ordinance in compliance with Chapter 62.*					
Wellhead Protection	No	State/Regional/Local	No	No	--
Comment:					
Emergency Management	Yes	County and Local	No	Yes	2021-HamptonTwp-006
Comment:					
Climate Change	No	Local	No	No	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans? If yes- how? Describe in comments.	Have aspects of the HMP been integrated into your codes/ordinances/plans? If no - add Mitigation Action #, if applicable.
Disaster Recovery Ordinance	No	Local	No	No	-
Comment:					
Disaster Reconstruction Ordinance	No	Local	No	No	-
Comment:					
Other: NFIP Freeboard	Yes	State & Local	No	No	--
Comment: • *The Township Engineer is responsible for this in compliance with N.J.A.C 7:13 – Flood Hazard Area Control Act.*					
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Yes	Local	**Yes**	No	--
Comment: *The Township is responsible for these ordinances in compliance with Chapter 48 – Carbonate Area Development, Chapter 87 – Soil Removal, and Chapter 95 – Trees. The Township's Stormwater Management ordinance (Chapter 207) regulates soils.*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	No	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Planning Board is responsible for this plan in compliance with Township of Hampton Master Plan, 2002.*					
Capital Improvement Plan	Yes	Local	No	No	-
Comment: *The Finance Department is responsible for this plan in compliance with the Township Budget,*					
Disaster Debris Management Plan	No	Local	Yes	Yes	2021-HamptonTwp-007
Comment:					
Floodplain or Watershed Plan	Yes	State & Local	No	No	-
Comment: *The Township Engineer is responsible for this plan in compliance with Chapter 62 Entitled Flood Damage Prevention Adopted 1982 and Updated 2011.*					
Stormwater Management Plan	Yes	State & Local	Yes	No	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *State/Local are responsible for this plan, which was adopted in 2006 entitled "Storm Water Control."*					
Stormwater Pollution Prevention Plan	No	State & Local	No	No	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans? If yes- how? Describe in comments.	Have aspects of the HMP been integrated into your codes/ordinances/plans? If no - add Mitigation Action #, if applicable.
• *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	State & Local	No	No	-
Comment:					
Habitat Conservation Plan	No	State & Local	No	No	-
Comment:					
Economic Development Plan	No	State & Local	No	No	-
Comment:					
Shoreline Management Plan	No	State	Yes – if located in a coastal zone	No	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	State & Local	No	No	-
Comment:					
Community Forest Management Plan	No	State & Local	No	No	-
Comment:					
Transportation Plan	No	State & Local	No	No	-
Comment:					
Agriculture Plan	No	State & Local	No	No	-
Comment:					
Climate Action Plan	No	State	No	No	-
Comment:					
Tourism Plan	No	State & Local	No	No	-
Comment:					
Business Development Plan	No	State & Local	No	No	-
Comment:					
Other: Open Space Plan	Yes	Local	No	No	-
Comment: • *The Planning Board is responsible for this plan in compliance with Chapter 17 of Hampton Twp. Code. The plan was adopted in November 2000 and revised and updated in January of 2013.*					
Response/Recovery Planning					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	County & Local	Yes	No	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The County is responsible for this plan in compliance with Hampton Township Emergency Operations Plan – Updated 2014.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	State & Local	No	No	-
Comment:					
Post-Disaster Recovery Plan	No	State & Local	No	No	-
Comment:					
Continuity of Operations Plan	No	State & Local	No	No	-
Comment:					
Public Health Plan	No	County	No	No	-
Comment:					
Other: Watershed Management or Protection Plan	Yes	State & Local	No	No	-
Comment: • *The Planning Board is responsible for this plan in compliance with Chapter 109-9, 11 & 13 and adopted 2006 Storm Water Control.*					

Table 9.11-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes Planning and Zoning; Construction Dept
Does your jurisdiction have the ability to track permits by hazard area?	No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes The Township completed a Housing Plan in 2019 with regard to its affordable housing obligation. The plan included a buildable land inventory that identified two major tracts of land for low and moderate income housing, with one located in the sewer service area.

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Hampton.

Table 9.11-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Bd./Governing Body
Mitigation Planning Committee	Yes	Emergency Management Coordinator

Staff/Personnel Resource	Available?	Department/Agency/Position
Environmental Board / Commission	No	-
Open Space Board / Committee	Yes	Open Space Committee
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Reverse 9-1-1 (opt-in)
Maintenance program to reduce risk	Yes	Risk Management Consultant/Statewide Insurance
Mutual aid agreements	Yes	Local/County
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Township Engineer Harold E. Pellow
Engineers or professionals trained in building or infrastructure construction practices	Yes	Township Engineer Harold E. Pellow
Planners or engineers with an understanding of natural hazards	Yes	Township Engineer Harold E. Pellow
Staff with training in benefit/cost analysis	Yes	Township Administrator Jessica Caruso
Staff with training in green infrastructure	Yes	Township Engineer Harold E. Pellow
Staff with education/knowledge/training in low impact development	Yes	Township Engineer Harold E. Pellow
Surveyor	Yes	Township Engineer Harold E. Pellow
Stormwater engineer	Yes	Township Engineer Harold E. Pellow
Personnel skilled or trained in GIS applications	Yes	Township Engineer Harold E. Pellow
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Emergency Management Coordinator Edward Hayes
Watershed planner	No	-
Environmental specialist	No	-
Grant writers	Yes	Township Administrator Jessica Caruso
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Township Engineer Harold E. Pellow
Other: Professionals trained in conducting damage assessments	Yes	Construction Official and Local Sub-code Officials

Fiscal Capability

The table below summarizes financial resources available to the Township of Hampton.

Table 9.11-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	Yes
Withhold Public Expenditures in Hazard-Prone Areas	Only in Private Communities
State-Sponsored Grant Programs	Yes

Financial Resource	Accessible or Eligible to Use?
Development Impact Fees for Homebuyers or Developers	COAH
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Hampton.

Table 9.11-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes Edward Hayes (Emergency Management)
Do you have personnel skilled or trained in website development?	Yes- website creation in progress
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes- COVID-19 info and HMP poll/survey
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes- OEM Register Ready

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Hampton.

Table 9.11-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	9	2020
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-
Disaster/Safety Programs in/for Schools	Yes	-	-
Public Education Program/Outreach (through website, social media)	Yes	Township Website	-
Public-Private Partnerships	Yes	Local Fire Department	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of

local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.11-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) – Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Strong
Invasive Species	Moderate
Nor'Easter	Strong
Severe Weather	Strong
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.11-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Township Engineer & DPW
Who is your floodplain administrator? (name, department/position)	Harold E. Pellow & Associates, Inc.
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	September 29, 2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements set by FEMA and the State.
When was the most recent Community Assistance Visit or Community Assistance Contact?	July 30, 2012
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes

Criterion	Response
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	Continuing education and certification training on floodplain management would be welcomed by the FPA if it were offered in the County.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No, however the County has considered joining and would attend a CRS seminar if offered locally.
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	7
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	1 0 $0
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*

9.11.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Hampton's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.10-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.11-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	N/A
March 7, 2018	Winter Storm	No	An area of low pressure moving into the region caused considerable snowfall in Sussex County.	The Township did not experience property damage. The Township expanded funds for overtime for DPW.
May 2018	Rain/Wind Event	No	The County experienced a rain/wind event causing localized damage.	The Township did not experience property damage. The Township expanded funds for overtime for DPW.
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	As of December 24, 2020 the Township has had 117 reported cases of COVID-19.

Source: FEMA 2020; NOAA-NCES 2020; Sussex COunty
Note:

9.11.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Hampton risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Hampton that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Hampton has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Hampton.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.11-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
22-23 Howell Mill Pond	Dams	X	X
22-24 Balesville Dam	Dams	X	X

Source: Sussex County Planning Partnership 2020
Note:
**Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The Township has two culverts that experience drainage issues. One culvert is located at the corner of Ike Williams Road and Dickson Road; the other is located at Old Swartswood Road.
- The Township's trees and forest stands have been impacted by Gypsy moths and lantern fly infestations. The past infestations have left a number of dead standing oaks.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves

an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Hampton ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Hampton. The Township of Hampton has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Hampton indicated that the risk for drought had decreased since 2016.

Table 9.11-13. Township of Hampton Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Low	Medium	Low	Low	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Medium

9.11.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.10-15 and Table 9.10-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.11-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Hampton-1 (new)	Ensure continuity of operations by purchasing and installing emergency generators	Township Administration	Completed		
Hampton-2 (old #3)	Develop and implement an enhanced all-hazards, public outreach / education / mitigation information program on natural hazard risks and what they can do in	Township Administration	Ongoing Capability		

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
	the way of mitigation and preparedness, including flood insurance.				
Hampton-3 (new)	Purchase emergency vehicles – fire truck and ambulance	Township Fire and Rescue	In progress	X	2021-HamptonTwp-002
Hampton-4 (new)	Stabilize Ike Williams and Old Swartswood Roads to ensure life safety and passage – roads are deteriorating due to erosion from water.	Township and NJDEP	No progress	X	2021-HamptonTwp-001 2021-HamptonTwp-003
Hampton-5 (old #1)	Retrofit roof to meet current snow load standards on Department of Public Works facility located on Rumsey Way.	Township DPW	In progress	X	2021-HamptonTwp-004
Hampton-6 (old #3)	Implement Fire Wise program throughout Township.	OEM Coordinator	In progress	X	2021-HamptonTwp-005

The Township of Hampton did not identify mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Hampton participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Hampton participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.10-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Hampton would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1)

for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.10-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.11-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Hampton Twp-001	Old Swartswood Road Culvert Mitigation	**Problem**: The culvert located at the northern intersection of CR-622 (Swartswood Road) and Old Swartswood is deteriorating. The 36" RCCP drain requires replacement and may cause the road to collapse. The shoulder of the road has longitudinal cracking, and there is significant erosion downstream of the culvert. The concrete is separating in several areas, and rip rap has fallen through the pipe separation. The runoff derives from two ponds at the Salesian Sisters property, where the channel runs downhill, under the road, the enters a small pond. From the pond, the channel runs underneath the Township and County Road. **Solution:** The Township proposes to re-examine drainage in the area and implement mitigating measures for the culvert.	Existing	Flood; Hurricane Tropical Storm; Nor'easter; Severe Weather; Severe Winter Weather	1, 2, 4, 6	Township DPW/Engineer; DEP; Sussex County; private owners	Local match; County funds	Preservation of road functions	Medium	3 years	High	SIP	SP
2021-Hampton Twp-002	Ambulance Acquisition	**Problem**: The Township has been losing emergency vehicles due to aging equipment and loss of staff. The Township has identified a need for an ambulance. **Solution:** The Township proposes to acquire a new ambulance.	New	All hazards	1, 3, 5, 6	Hampton Fire Rescue	AFG; Local match	Enhanced emergency services operations	Medium	5 years	Medium	SIP	ES
2021-Hampton Twp-003	Ike Williams/Dickson Road Mitigation	**Problem**: Ike Williams Road and Dickson Road comprise a continuous 1.6-mile road that branches off Route 521. The terminus of these two roads occurs at a curve located adjacent to private properties, where a tributary of Little Swartswood Lake runs southward towards the lake. Due to the unique topography of the area, water runs off the surrounding hills and washes out the culvert located at the curve. The private property ownership complicates potential mitigation solutions.	Existing	Flood; Geological; Hurricane/ Tropical Storm Nor'easter; Severe Weather;	1, 2, 4, 6	Township DPW; DEP; Private owner	Transportation Trust Fund; Local match	Protection of public infrastructure and private	Medium	3 years	High	SIP	SP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		In addition to this culvert, Ike Williams Road shows longitudinal cracking along the roadway where the creek under the aforementioned intersection runs under Ike Williams Road approximately 150 feet to the southwest. **Solution:** The Township proposes to study the drainage issue and implement mitigation measures to protect the roadway intersection, downstream properties, and the Ike Williams Road culvert. Potential mitigation measures could include retention basins.											
2021-Hampton Twp-004	DPW Roof Retrofit	**Problem**: The roof of the Township's DPW facility requires a retrofit for compliance. **Solution:** The Township proposes to examine the roof of the DPW and determine and implement design solutions for the roof.	Existing	Hurricane/ Tropical Storm Nor'easter; Severe Weather; Severe Winter Weather	1, 2, 4, 6	Township DPW; Engineer	Township funds; HMGP	Protection of DPW facility	Low	1 year	High	SIP	PP
2021-Hampton Twp-005	Firewise Participation	**Problem**: The Township has a significant wildfire risk that is exacerbated by dead trees resulting from pest infestations (gypsy moth and lantern flies) and federal/state land management issues. **Solution:** The Township proposes to participate in the Firewise program to mitigate wildfire risk.	Existing	Wildfire	1, 2, 3, 4, 5, 6	NJDEP; Hampton Fire Rescue	Township funds	Increased preparation/responsiveness to wildfires	No cost	1 year	High	EAP	ES
2021-Hampton Twp-006	OEM Trailer Acquisition	**Problem**: The Township buildings lack a capacity for OEM functions and storage of records related to emergency management. **Solution:** The Township proposes to acquire a trailer to house OEM functions and consolidate records that need to be retained from hazard events.	New	All hazards	3, 5, 6	Township OEM	FEMA; Township Funds	Storage; communications safety; consolidation of records /FEMA	Low	Short-term	Medium	SIP	ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Hampton Twp-007	Disaster Debris Management Plan	**Problem:** The Township lacks a debris management plan. **Solution:** The Township will develop and adopt a Disaster Debris Management Plan.	N/A	All Hazards	4, 6	Hampton Twp. - Administration	Municipal budget	Plan in place for debris management	Staff time	1 year	High	LPR	ES
2021-Hampton Twp-008	Flood Damage Prevention Ordinance	**Problem:** The Township's Flood Damage Prevention Ordinance lacks the state mandated 1 foot of freeboard. **Solution:** The Township will update the ordinance to include 1 foot of freeboard for new construction in the SFHA.	New	Flood	2	Administration, FPA	Township budget	Increased flood protection for new construction	Staff time	6 months	High	LPR	PR

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

BRIC	*Building Resilient Infrastructure and Communities*
FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*

- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.11-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-HamptonTwp-001	Old Swartswood Road Culvert Mitigation	1	1	1	1	1	1	-1	1	1	1	1	1	1	1	13	High ⚠
2021-HamptonTwp-002	Ambulance Acquisition	1	1	1	1	1	1	-1	1	1	1	1	1	1	1	13	High
2021-HamptonTwp-003	Ike Williams/Dickson Road Mitigation	1	1	1	1	1	1	-1	1	1	1	1	1	1	1	13	High
2021-HamptonTwp-004	DPW Roof Retrofit	1	1	1	1	1	1	-1	1	1	1	1	1	1	1	13	High
2021-HamptonTwp-005	Firewise Participation	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-HamptonTwp-006	OEM Trailer Acquisition	0	1	0	1	1	1	-1	0	1	1	1	1	1	0	8	Medium
2021-HamptonTwp-007	Disaster Debris Management Plan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-HamptonTwp-008	Flood Damage Prevention Ordinance	0	1	1	1	1	1	1	1	1	0	1	1	1	1	12	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.11-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure	X				X			
Disease Outbreak	X				X			
Drought	X				X			
Earthquake	X				X			
Flood	X				X			
Geologic	X				X			
Hazardous Materials	X				X			
Hurricane and Tropical Storm	X	X			X	X		
Invasive Species	X				X			
Nor'Easter	X	X			X	X		
Severe Weather	X	X			X	X		
Severe Winter Weather	X	X			X	X		
Wildfire	X				X			

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.11-1. Township of Hampton Hazard Area Extent and Location Map 1

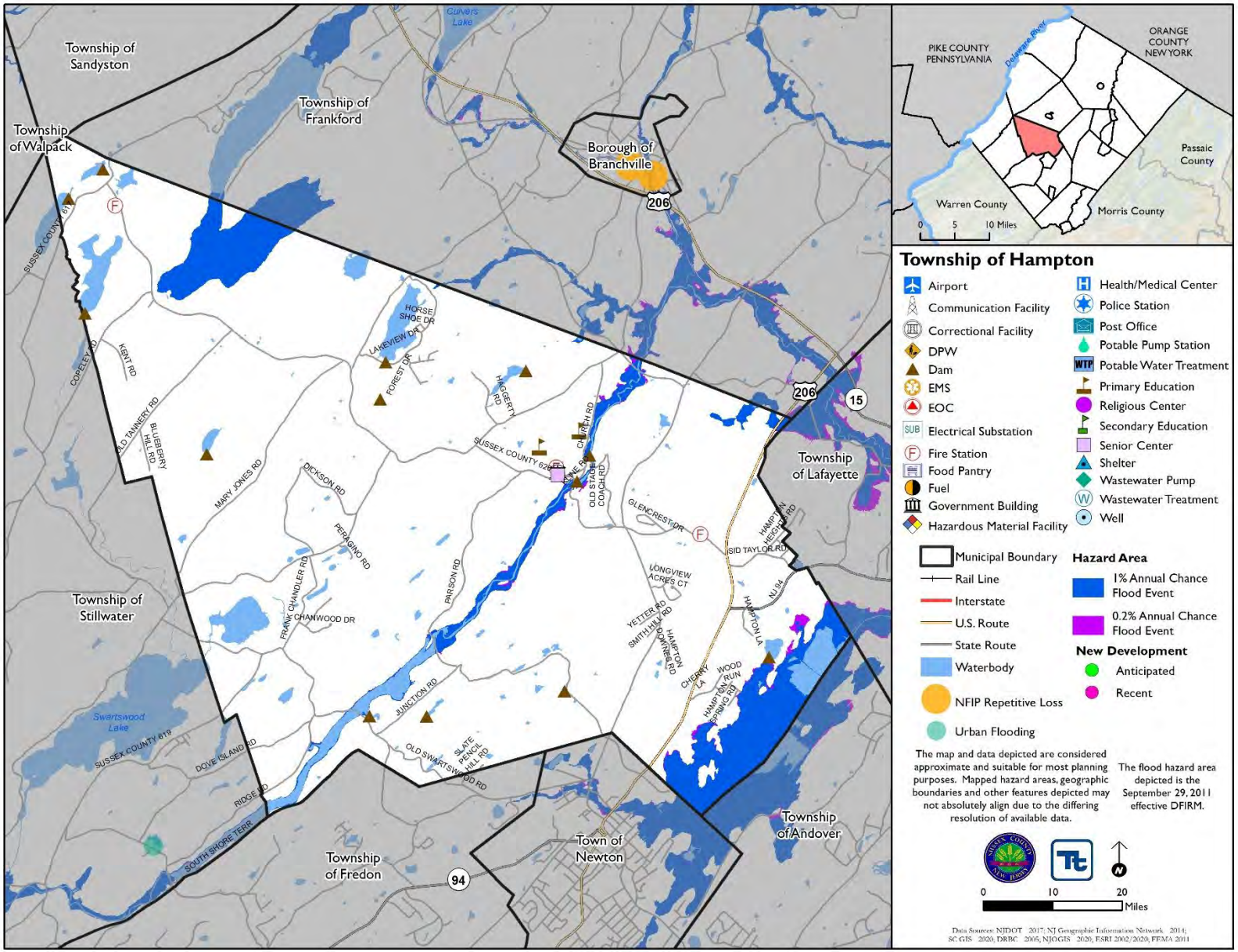


Figure 9.11-2. Township of Hampton Hazard Area Extent and Location Map 2

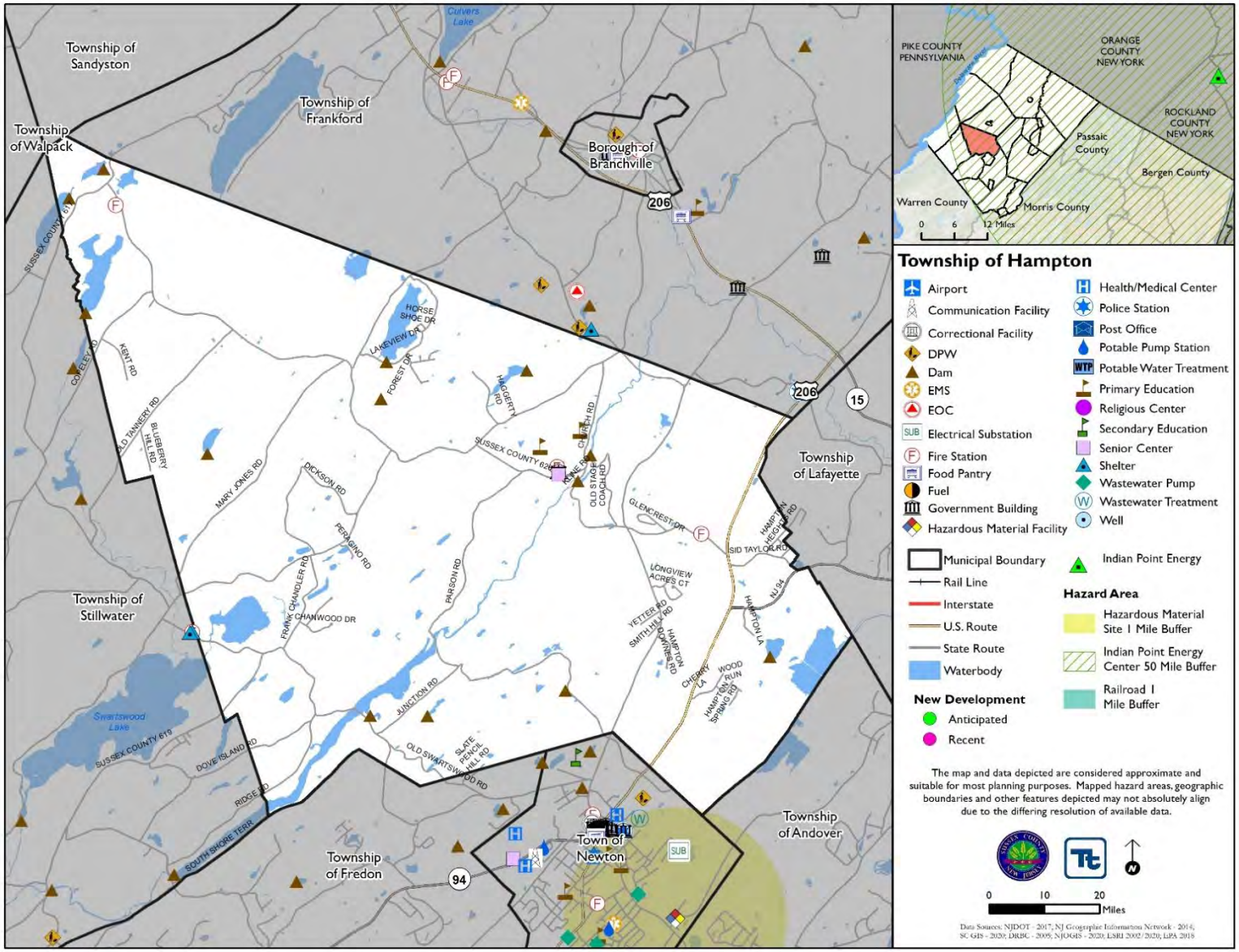
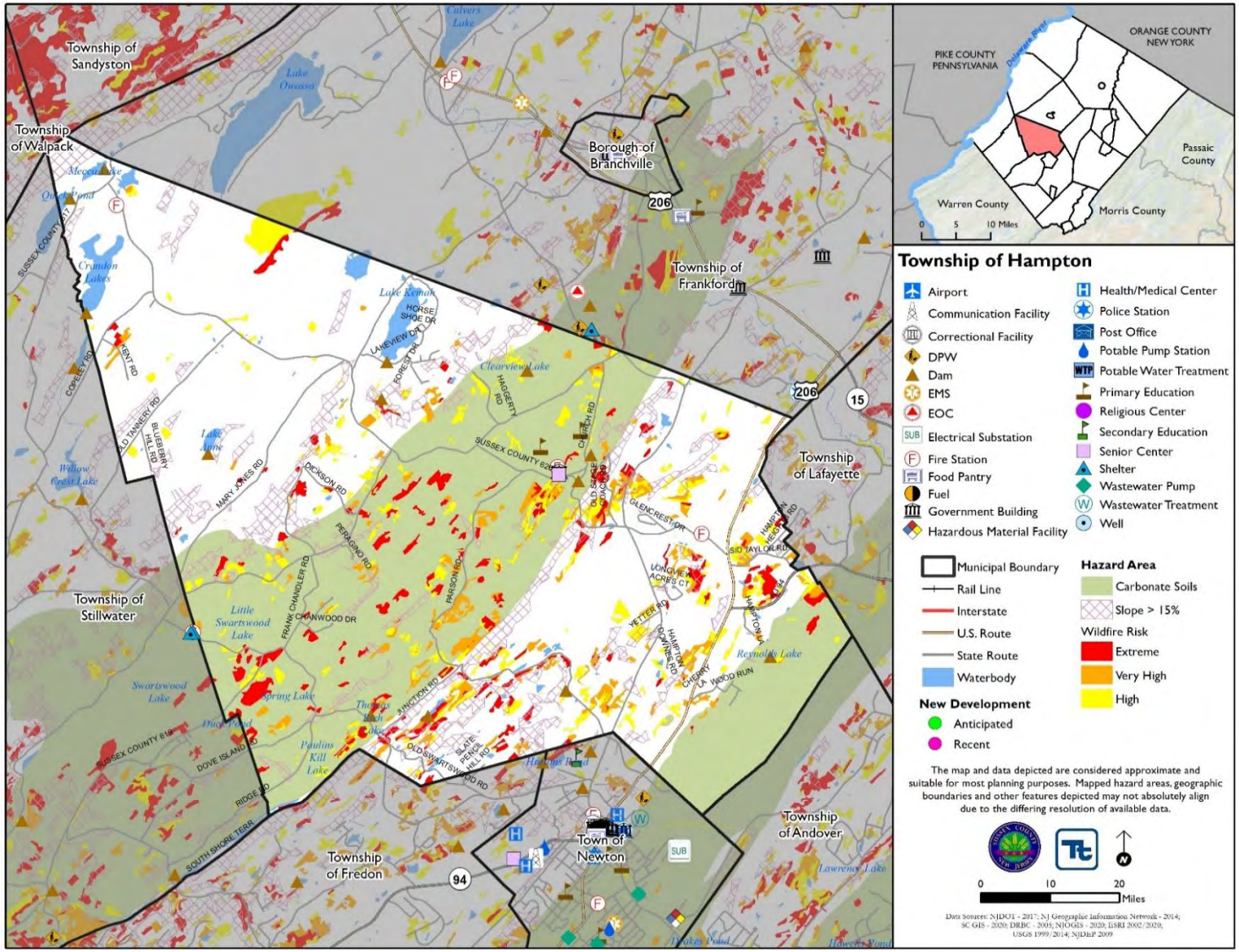


Figure 9.11-3 Township of Hampton Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Old Swartswood Road Culvert Mitigation		
Project Number:	2021-HamptonTwp-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood; Hurricane Tropical Storm; Nor'easter; Severe Weather; Severe Winter Weather		
Description of the Problem:	The culvert located at the northern intersection of CR-622 (Swartswood Road) and Old Swartswood is deteriorating. The 36" RCCP drain requires replacement and may cause the road to collapse. The shoulder of the road has longitudinal cracking, and there is significant erosion downstream of the culvert. The concrete is separating in several areas, and rip rap has fallen through the pipe separation. The runoff derives from two ponds at the Salesian Sisters property, where the channel runs downhill, under the road, the enters a small pond. From the pond, the channel runs underneath the Township and County Road.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township proposes to re-examine drainage in the area and implement mitigating measures for the culvert.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Preservation of road functions
Useful Life:	30 years	**Goals Met:**	1, 2, 4, 6
Estimated Cost:	TBD	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	Local match; County funds
Responsible Organization:	Township DPW/Engineer; DEP; Sussex County; private owners	**Local Planning Mechanisms to be Used in Implementation if any:**	Capital Improvement Plan

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Road abandonment	Low	Not logistically feasible
	Culvert Mitigation	TBD	Technically feasible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Old Swartswood Road Culvert Mitigation	
Project Number:	2021-HamptonTwp-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	Culvert Mitigation will protect road and downstream properties
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	-1	Project requires funding
Environmental	1	
Social	1	Project prevents social disruption from utility interruption
Administrative	1	
Multi-Hazard	1	Flood; Hurricane Tropical Storm; Nor'easter; Severe Weather; Severe Winter Weather
Timeline	1	
Agency Champion	1	Township will champion
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Old Swartswood Rd Drain 12/16/20

Outlet

Outlet down hill

Pipe Seperation

Upstream - Recently dug out by property owner - Root exposure

Action Worksheet			
Project Name:	Ike Williams/Dickson Road Mitigation		
Project Number:	2021-HamptonTwp-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood; Hurricane Tropical Storm; Nor'easter; Severe Weather; Severe Winter Weather		
Description of the Problem:	Ike Williams Road and Dickson Road comprise a continuous 1.6-mile road that branches off Route 521. The terminus of these two roads occurs at a curve located adjacent to private properties, where a tributary of Little Swartswood Lake runs southward towards the lake. Due to the unique topography of the area, water runs off the surrounding hills and washes out the culvert located at the curve. The private property ownership complicates potential mitigation solutions. In addition to this culvert, Ike Williams Road shows longitudinal cracking along the roadway where the creek under the aforementioned intersection runs under Ike Williams Road approximately 150 feet to the southwest.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township proposes to study the drainage issue and implement mitigation measures to protect the roadway intersection, downstream properties, and the Ike Williams Road culvert. Potential mitigation measures could include retention basins.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Protection of public infrastructure and private
Useful Life:	30 years	**Goals Met:**	1, 2, 4, 6
Estimated Cost:	TBD	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	3 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	Transportation Trust Fund; Local match
Responsible Organization:	Township DPW/Engineer; DEP; Sussex County; private owners	**Local Planning Mechanisms to be Used in Implementation if any:**	Capital Improvement Plan

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Road abandonment	Low	Not logistically feasible
	Culvert Mitigation	TBD	Technically feasible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Ike Williams/Dickson Road Mitigation	
Project Number:	2021-HamptonTwp-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	Culvert Mitigation will protect road and downstream properties
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	-1	Project requires funding
Environmental	1	
Social	1	Project prevents social disruption from utility interruption
Administrative	1	
Multi-Hazard	1	Flood; Hurricane Tropical Storm; Nor'easter; Severe Weather; Severe Winter Weather
Timeline	1	
Agency Champion	1	Township will champion
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	DPW Roof Retrofit		
Project Number:	2021-HamptonTwp-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Hurricane/Tropical Storm Nor'easter; Severe Weather; Severe Winter Weather		
Description of the Problem:	The roof of the Township's DPW facility requires a retrofit for compliance.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township proposes to examine the roof of the DPW and determine and implement design solutions for the roof.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Protection of DPW facility
Useful Life:	50 years	**Goals Met:**	1, 2, 4, 6
Estimated Cost:	TBD	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	1 year
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	Township funds; HMGP
Responsible Organization:	Township DPW; Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Capital Improvement Plan

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Facility Replacement	High	Not cost effective
	Roof retrofit	TBD	Technically feasible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	DPW Roof Retrofit	
Project Number:	2021-HamptonTwp-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect workers in facility
Property Protection	1	Project will protect DPW facility
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	-1	Project requires funding
Environmental	1	
Social	1	Project prevents social disruption from loss of facility
Administrative	1	
Multi-Hazard	1	Hurricane/Tropical Storm Nor'easter; Severe Weather; Severe Winter Weather
Timeline	1	
Agency Champion	1	Township will champion
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	OEM Trailer Acquisition		
Project Number:	2021-HamptonTwp-006		
Risk / Vulnerability			
Hazard(s) of Concern:	All hazards		
Description of the Problem:	The Township buildings lack a capacity for OEM functions and storage of records related to emergency management.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township proposes to acquire a trailer to house OEM functions and consolidate records that need to be retained from hazard events.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Storage; communications safety; consolidation of records
Useful Life:	30 years	**Goals Met:**	3, 5, 6
Estimated Cost:	Low	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	Medium	**Desired Timeframe for Implementation:**	Short-term
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA; Township Funds
Responsible Organization:	Township OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Capital Improvement Plan

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Building addition	High	Not cost effective
	Trailer acquisition	TBD	Technically feasible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	OEM Trailer Acquisition	
Project Number:	2021-HamptonTwp-006	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Protection of records
Cost-Effectiveness	0	
Technical	1	
Political	1	
Legal	1	
Fiscal	-1	Project requires funding
Environmental	0	
Social	1	Project prevents social disruption from loss of facility
Administrative	1	
Multi-Hazard	1	Project will protect records from all types of hazard events
Timeline	1	
Agency Champion	1	Township will champion
Other Community Objectives	0	
Total	8	
Priority (High/Med/Low)	Medium	

9.12 TOWNSHIP OF HARDYSTON

This section presents the jurisdictional annex for the Township of Hardyston. The annex includes a general overview of the Township of Hardyston; an assessment of the Township of Hardyston's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.12.1 Hazard Mitigation Planning Team

The Township of Hardyston followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.12-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: William Hickerson, OEM Coordinator Address: 149 Wheatsworth Road, Suite A, Hardyston, NJ 07419 Phone Number: (973) 615-5687 Email: whickerson@gmail.com	Name / Title: Carrine Piccolo-Kaufer, Township Manager/Planner Address: 149 Wheatsworth Road, Suite A, Hardyston, NJ 07419 Phone Number: (973) 823-7020 Email: cpiccolo@hardyston.com
NFIP Floodplain Administrator	
Name / Title: Joseph Butto, Construction Official Address: 149 Wheatworth Road Suite A Hardyston NJ 07419 Phone Number: (973) 823-7020 Email: jbutto@hardyston.com	

Name	Title	Method of Participation
William Hickerson	OEM Coordinator	Attended the kickoff meeting, annex training, risk assessment meeting and mitigation strategy workshop. Provided data and information for the annex update.
Carrine Piccolo-Kaufer	Township Manager/Planner	Secondary point of contact.
Joseph Butto	Construction Official	NFIP Floodplain Administrator

9.12.2 Jurisdiction Profile

The Township of Hardyston is located in northeastern Sussex County. It is bordered to the north by the Townships of Vernon and Wantage, to the south by the Township of Sparta and Morris County, to the east by Vernon Township and Morris County, and to the west by Lafayette Township. The Township covers an area of approximately 32.6 square miles. There are numerous streams located within the Township and include: Wallkill River, Hamburg Creek, Mud Pond Outlet Stream, Pequannock River, Lake Stockholm Brook, Franklin Pond Creek, Beaver Run, and Black Creek. The following unincorporated communities are located within the Township: Beaver Run, North Church, Big Springs, Rudeville, and Beaver Lake.

According to the U.S. Census, the 2010 population for the Township of Hardyston was 8174. The estimated 2018 population was 7786, a 4 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 5.5 percent of the population is 5 years of age or younger and 18.8 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.12.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.11-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.12-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	6	0	2	0	3	0	13	0	0	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	1	0	3	0	0	0	2	0	0	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
Crystal Springs - Shotmeyer	Single Family	38	Coventry, Woodcot, Tarrington, Blocks 16.28,16.30, 16.34, 16.37	Railway Incident Hazard Area, Nuclear Incident Hazard Area, Carbonate Soil, Steep Slopes, Wildfire	Under Construction
Crystal Springs – Shotmeyer	Multi-Family	1 (18 Units)	Tarrington Road , Block 16.29 Lot 1	Railway Incident Hazard Area, Nuclear Incident Hazard Area, Carbonate Soil, Wildfire	Approved
Emerald Estates	Single Family	4	Emerald Drive/Ruby Court, Block 63, Lots 26.15,26.16,26.17,27.01	Railway Incident Hazard Area, Hazardous Material Incident Area, Nuclear Incident Hazard Area, Carbonate Soil, Steep Slopes, Wildfire	Under Construction
Estell Manor	Single Family	3	Estell Drive, Block 75 Lot 11.03	Railway Incident Hazard Area, Hazardous Material Incident Area, Nuclear Incident Hazard Area,	

				Carbonate Soil, Wildfire	
NA	None	Under construction	Block 75.01 Lots 1 & 16	Railway Incident Hazard Area, Hazardous Material Incident Area, Nuclear Incident Hazard Area, Carbonate Soil, Wildfire	Under Construction
Ridgefield Commons	Single Family - Townhouse	8	Brookview, Block 67.23 Lots 1-8	Nuclear Incident Hazard Area, Carbonate Soil, Wildfire	Under Construction
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Crystal Springs – Balmorale	Single Family	15	Exeter Lane/Sutton Court	Railway Incident Hazard Area, Nuclear Incident Hazard Area, Carbonate Soil, Steep Slopes, Wildfire	
Brecia Farms	Single Family	18	Anthony Lane/Davon Court	Hazardous Material Incident Area, Nuclear Incident Hazard Area, Carbonate Soil, Steep Slopes, Wildfire	

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.12.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Hardyston performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of planning, legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of administrative and technical capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change
- Information on NFIP compliance

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Hardyston identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Hardyston and where hazard mitigation has been integrated.

Table 9.12-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Construction Office is responsible for this code in compliance with State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.)* • *The Township's building code is found in Chapter 62 (Building Construction) of the municipal code. It was originally adopted in 1972 and revised in 1998 and 2000. Prior to the issuance of a building permit for any single-family home, the applicant must submit two copies of a detailed site plan to the building inspector. The site plan must show swales, brooks, streams, springs, retaining walls, terraces, sidewalks, slopes, major rock formations, existing easements, building line setback and elevation at the curb, where existing, and, if no curb, elevation at existing opposite lot corners and center line of driveway where building is to be located, and all provisions for the proper drainage thereof shall be shown on the plan.*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Zoning Board is responsible for this code in compliance with the Town Council.* • *The Zoning Code is found in Chapter 185 of the Township's municipal code. It was adopted in 1972 and revised in 1998 and 2021. There are several purposes to the code including securing safety from fire, flood, panic and other natural and man-made disasters.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *Chapter 158 (Subdivision of Land) was first adopted in 1972 and amended in 1998. The purpose of this code is to provide rules, regulations and standards to guide land subdivision in the Township in order to promote the public health, safety, convenience and general welfare of the Township. It shall be administered to ensure the orderly growth and development, conservation, protection and proper use of land and adequate provision for circulation, utilities and services.* • *The Zoning Board and Planning Board are responsible for administering this code.*					
Stormwater Management	Yes	State and Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The Town Council is responsible for this ordinance in compliance with the State.* • *The Township's code contains a section regarding stormwater management in accordance with NJDEP. It is found in Chapter 185 (Zoning) of the municipal code. The purpose of the code is to establish minimum stormwater management requirements and controls for major development in the Township. Design standards for stormwater management measures should be designed to take into account existing site conditions including environmentally critical areas; wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability, and texture; drainage area and drainage patterns; and the presence of solution-prone carbonate rocks (limestone).*					
Post-Disaster Recovery	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Real Estate Disclosure	No	State, Division of Consumer Affairs	Yes	-	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	State	Yes – if municipality has a Planning Board	No	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.* • *The Town Council is responsible for these ordinances in compliance with the State.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Town Council is responsible for these requirements in compliance with the Town Council.*					
Environmental Protection	No	-	No	-	-
Comment:					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	2021-Hardyston-009
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Construction official is responsible for this ordinance in compliance with Chapter 96.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	Yes	Local	No	No	-
Comment: • *Chapter 19 of the municipal code, adopted in 1972 and revised in 1998. The chapter identified the emergency management coordinator and council.*					
Climate Change	No	-	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other:	No	-	No	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	State	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Planning Board is responsible for this plan, which was adopted in 2014. Several objectives of the plan align with those identified in the HMP update.* • *Portions of the Township are located in the Highlands Regions. The master plan conforms with the Highlands Regional Master Plan and supports elements and objectives of the overall master plan.*					
Capital Improvement Plan	Yes	Town Council	No	Yes	-
Comment: • *The Town Manager is responsible for this plan, which was adopted in 2014.* • *The Township's municipal budget outlines the capital budget and improvement program for the next three years. There is a line item for various capital improvements; however, details regarding the improvements is not listed in the 2020 budget.*					
Disaster Debris Management Plan	No	-	No	-	2021-Hardyston-008
Comment:					
Floodplain or Watershed Plan	Yes	State	No	Yes	-
Comment: *The Planning Board is responsible for this plan. This plan is a part of the Master Plan.*					
Stormwater Management Plan	Yes	State	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The Township's Municipal Stormwater Management Plan was adopted in March 2005. The plan documents the strategy for the Township to address stormwater-related impacts. Several goals of the plan aligns with the goals of the HMP update, including protecting public safety and reducing impacts of hazards (e.g. flood and erosion).* • *The Town Council is responsible for this plan.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Stormwater Pollution Prevention Plan	Yes/No	If yes, who enforces?	Yes	Yes/No	Yes/No
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	Yes	Local	No	Yes	-
Comment: *Planning Board is responsible for this plan which is a part of the Master Plan*					
Transportation Plan	Yes	Local	No	Yes	-
Comment: *The Planning Board is responsible for this plan, which is a part of the Master Plan.*					
Agriculture Plan	Yes	Local	No	Yes	-
Comment: *The Planning Board is responsible for this plan which is a part of the Master Plan*					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment: *While there is no plan in place, the Township has an Economic Development Advisory Commission that assists in attracting new business and industry as well as retaining established businesses.*					
Other: Open Space Plan	Yes	Local	No	Yes	-
Comment: • *The Planning Board is responsible for this plan, which is a part of the Master Plan.*					
Stream Corridor Management Plan	Yes	Local	No	Yes	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment: *The Planning Board is responsible for this plan, which is a part of the Master Plan.*					
Watershed Management or Protection Plan	Yes	Local	No	Yes	-
Comment: *The Planning Board is responsible for this plan, which is a part of the Master Plan.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Township OEM	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *This plan was adopted in 2014.* • *The Office of Emergency Management is responsible for this plan.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	Township OEM	No	Yes	-
Comment: *Part of the Township's EOP*					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	Yes	County	No	Yes	-
Comment: *Performed at the county level*					
Other	No	-	No	-	-
Comment:					

Table 9.12-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Building Department
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes, the Township completed a buildable land inventories as part of its housing element.

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Hardyston.

Table 9.12-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board and Zoning Bord of Adjustment
Mitigation Planning Committee	Yes	OEM
Environmental Board / Commission	Yes	Clean Communities Program

Staff/Personnel Resource	Available?	Department/Agency/Position
Open Space Board / Committee	No	-
Economic Development Commission / Committee	Yes	Hardyston Township Economic Development Advisory Commission - composed of volunteer Township residents, assists in attracting new business and industry as well as retaining established businesses. Their mission is to maintain the quality of life of our residents by stabilizing and expanding our local tax base.
Warning Systems / Services (mass notification system, outdoor warning signals)	Yes	Swift911 and PSAP
Maintenance program to reduce risk	Yes	Town Manager Insurance related
Mutual aid agreements	Yes	Fire Department, Police and EMS
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Deputy Manager/planner and Construction
Engineers or professionals trained in building or infrastructure construction practices	Yes	Construction
Planners or engineers with an understanding of natural hazards	Yes	Deputy Manager/Planner
Staff with training in benefit/cost analysis	Yes	OEM and Deputy Manager
Staff with training in green infrastructure	Yes	Land Use/Town Manager
Staff with education/knowledge/training in low impact development	Yes	Town Manager
Surveyor	No	-
Stormwater engineer	Yes	Township Engineering dept
Personnel skilled or trained in GIS applications	Yes	Zoning
Local or state water quality professional	No	Use Sussex County BOH
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM
Watershed planner	Yes	Town planner/Manager
Environmental specialist	No	-
Grant writers	Yes	OEM and Deputy Manager
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Construction Official
Other: Professionals trained in conducting damage assessments	Yes	OEM and Construction

Fiscal Capability

The table below summarizes financial resources available to the Township of Hardyston.

Table 9.12-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes; Hardyston Town Council
Capital Improvements Project Funding	Yes; Hardyston Town Council
Authority to Levy Taxes for Specific Purposes	Yes; Hardyston Town Council
User Fees for Water, Sewer, Gas or Electric Service	Yes; Hardyston Town Council
Incur Debt through General Obligation Bonds	Yes; Hardyston Town Council
Incur Debt through Special Tax Bonds	Yes; Hardyston Town Council
Incur Debt through Private Activity Bonds	Yes; Hardyston Town Council

Financial Resource	Accessible or Eligible to Use?
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	No
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other: Open Space Acquisition Funding Programs	Yes; Hardyston Town Council

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Hardyston.

Table 9.12-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	The Township's municipal website has notices and announcements specific to the municipality. They also have a storm preparation checklist on their main page.
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes, Township Lake and development associations

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Hardyston.

Table 9.12-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	No	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Not certified	Joined program on 9/7/2010

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.12-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.12-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Building Department
Who is your floodplain administrator? (name, department/position)	Joe Butto, Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	???
What is the date that your flood damage prevention ordinance was last amended?	July 5, 2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	This program exceeds the minimum requirements set by the FEMA and the State. The master plan and planning board have a review for flood zones during application process.
When was the most recent Community Assistance Visit or Community Assistance Contact?	January 10, 1995
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	???
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	???

Criterion	Response
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	No
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No, and the community has not considered joining CRS at this time.
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	8 policies
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	2 claims $60,787 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

Opportunities for Future Integration

- **Firewise Program:** The Township will follow the proper steps in applying for and becoming a Firewise community. This includes forming a board/committee, obtaining a wildfire risk assessment, developing an action plan, and hosting outreach events and programs. The Township will also create an education program (2021-Hardyston-002).
- **Disaster Debris Management Plan:** The Township will develop a debris management plan that will assist the municipality when they need to facilitate response and recovery after a debris-causing incident. The plan will provide direction to facilitate and coordinate the management of debris following a disaster (2021-Hardyston-008).
- **Flood Damage Prevention Ordinance:** The Township will update its flood damage prevention ordinance to meet the New Jersey requirement of one foot of freeboard (2021-Hardyston-009).

9.12.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Hardyston's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.11-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.12-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	???

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	Currently 30K request for cost reimbursement submitted

Source: FEMA 2020, NOAA NCEI 2020

9.12.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Hardyston risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Hardyston that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Hardyston has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Hardyston.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.12-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
22-192 Canistear Reservoir #1 Dam	Dam	X	X

Source: Sussex County Planning Partnership 2020
Note:
**Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The Township's DPW fuel station is a critical facility and provides essential services to the community. The station currently does not have a source of backup power. In the event of a power outage, the station can fuel municipal vehicles.
- Hardyston Township has over 4000 acres of State and Newark Watershed woods that in many cases backup to housing developments. This exposes many homes to wildfire and brush fire events.
- Colson Terrace experiences storm drainage issues during periods of rain. This reduces access to this road and the facilities located there, including the EMS and fire departments.
- It is unknown if the roof of the elementary school meets the current snow load standards.
- It is unknown if the windows of the elementary school are impact resistant.
- It is unknown if the windows on the southwest side of the municipal building are impact resistant.
- Due to the current COVID-19 pandemic, the Township has identified several areas in their buildings that could be enhanced to reduce expose to bacteria and viruses.
- The Township currently does not have an adopted debris management plan. Without a plan in place, there are no identified resources in place to properly address debris and do not have identified locations for debris storage.
- The Township's current flood damage prevention ordinance was last adopted in 2011. It currently does not have a freeboard requirement and does not meeting New Jersey's minimum requirement.

HAZARD RANKING

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Hardyston ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Hardyston. The Township of Hardyston has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Hardyston agreed with the calculated hazard rankings.

Table 9.12-13. Township of Hardyston Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Medium	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Medium

9.12.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.11-15 and Table 9.11-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.12-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Hardyston-1 (new)	Ensure continuity of operations at critical facilities and municipal buildings: Hardyston Township Critical Facilities Generators	OEM	Fire Houses and Police/Dispatch complete. DPW and fuel station no funding	X (for DPW)	2021-Hardyston-001
Hardyston-2 (old #1)	Implement Fire Wise Program throughout Township. Create an education program and set up town hall meetings.	OEM Coordinator	No progress	X	2021-Hardyston-002
Hardyston-3 (old #3)	Stormwater management study to correct storm drainage system located on Colson Terrace.	DPW and OEM	No progress	X	2021-Hardyston-003
Hardyston-4 (revised old #4)	Conduct engineering study to determine the correct actions for retrofitting the roof of the elementary school to meet current snow load standards. Once completed, identify mitigation actions to correct the problem.	School Board Administrator	No Progress	X	2021-Hardyston-004
Hardyston-5 (revised #5)	Conduct engineering study to determine the correct actions for retrofitting the gymnasium windows of the elementary school to make them impact resistant. Once completed, identify mitigation actions to correct the problem.	School Board Administrator	No Progress	X	2021-Hardyston-005
Hardyston-6 (revised #6)	Conduct engineering study to determine the correct actions for retrofitting the windows on the southwest side of the municipal building to make them impact resistant. Once completed, identify mitigation actions to correct the problem.	Township Manager	No Progress	X	2021-Hardyston-004
Hardyston-7 (revised #7)	Educate citizens on hazard mitigation and preparedness through Town Hall meetings and outreach programs.	OEM Coordinator	Ongoing/In Progress - meetings with lake and development associations on going	-	-
Hardyston-8	Establish a line item for mitigation project funding in	Township	Ongoing Capability	-	-

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
(new)	both the municipal budget and Capital Improvement Plan.				
Hardyston-9 (new)	Adopt and enforce codes and standards beyond FEMA and state NFIP minimum requirements.	Township	In Progress	X	2021-Hardyston-009
Hardyston-10 (new)	Where applicable, Township job descriptions will incorporate hazard mitigation.	Township	Ongoing Capability	-	-
Hardyston-11 (new)	Incorporate hazard mitigation in the daily practice of the Township; all projects identified in Township's annex will be a goal of the municipality.	Township	Ongoing Capability - Hardyston Twp. develops 5 year plans which address risk management	-	-
Hardyston-12 (new)	Establish a community resilience committee and advisor for the Township which will increase the Township's capacity to prepare for, mitigate, respond to and recover from hazard events in the community.	Township Administration, OEM Coordinator	Township OEM	-	-
Hardyston-13 (new)	Provide informational handouts or meetings to share best practices of hazard mitigation and increase the knowledge of mitigation throughout the Township.	Township Administration, OEM Coordinator	Available at town hall, adding to web pages	-	-
Hardyston-14 (new)	Develop a continuity of operations (COOP) plan which will identify mitigation opportunities.	Township			
Hardyston-15 (old #2)	Correct the stormwater drainage on Colson Terrace.	Township OEM and DPW	No Progress	X	2021-Hardyston-003

In addition to the above progress, the Township of Hardyston identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- None identified

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Hardyston participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Hardyston participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate*

Mitigation Measures for Floodprone Structures (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.11-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Hardyston would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.11-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.12-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Hardyston-001	DPW Fuel Station Generator	**Problem**: The Township's DPW fuel station is a critical facility and provides essential services to the community. The station currently does not have a source of backup power. In the event of a power outage, the station can fuel municipal vehicles. **Solution:** Determine the proper size permanent generator for the fuel station; once determined, purchase and install generator.	Existing	All	2, 6	Engineering, DPW, Township Administration	FEMA HMGP, Township Budget	Continuity of operations; provide fuel to municipal vehicles	$100,000	Within 2 years	High	SIP	ES
2021-Hardyston-002	Firewise Program	**Problem**: Hardyston Township has over 4000 acres of State and Newark Watershed woods that in many cases backup to housing developments. This exposes many homes to wildfire and brush fire events. **Solution:** The Township will follow the proper steps in applying for and becoming a Firewise community. This includes forming a board/committee, obtaining a wildfire risk assessment, developing an action plan, and hosting outreach events and programs. The Township will also create an education program and set up town hall meetings.	Existing	Wildfire	1, 2, 3	Township Administration, Fire Department	Township budget	Increase wildfire awareness, provide grant opportunities for Township	<$20,000	Within 4 years	Medium	LPR, EAP	PI, ES
2021-Hardyston-003	Colson Terrace Study	**Problem**: Colson Terrace experiences storm drainage issues during periods of rain. This reduces access to this road and the facilities located there, including the EMS and fire departments. **Solution:** Conduct an engineering study to determine the drainage issues on Colson Terrace. Once study is complete and solutions are identified, obtain funding to	Existing	Flood, Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather	1, 2, 5	Engineering, DPW, Township Administration	Township Budget, FEMA BRIC and HMGP	Identify drainage issues and provide solutions to reduce or alleviate the problem	$50,000+	Within 2 years	High	LPR. SIP	PR, SP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		implement best solution to alleviate the drainage issues.											
2021-Hardyston-004	Engineering Study (roof) on Elementary School	**Problem:** It is unknown if the roof of the elementary school meets the current snow load standards. **Solution**: Conduct engineering study to determine the correct actions for retrofitting the roof of the elementary school to meet current snow load standards. Once completed, identify mitigation actions to correct the problem	Existing	Severe Winter Weather, Nor'Easter	1, 2, 4	School Board Administration	School and Township Budgets	Identifies any required actions to protect the facility	$25,000	Within 3 years	Medium	LPR, SIP	PR
2021-Hardyston-005	Engineering Study (windows) on Elementary School	**Problem**: It is unknown if the windows of the elementary school are impact resistant. **Solution:** Conduct engineering study to determine the correct actions for retrofitting the gymnasium windows of the elementary school to make them impact resistant. Once completed, identify mitigation actions to correct the problem.	Existing	Severe Weather, Hurricane, Nor'Easter	1, 2, 4	School Board Administration	School and Township Budgets	Identifies any required actions to protect the facility	$25,000	Within 3 years	Medium	LPR, SIP	PR
2021-Hardyston-006	Engineering Study on Municipal Building	**Problem:** It is unknown if the windows on the southwest side of the municipal building are impact resistant. **Solution**: Conduct engineering study to determine the correct actions for retrofitting the windows on the southwest side of the municipal building to make them impact resistant. Once completed, identify mitigation actions to correct the problem.	Existing	Severe Weather, Hurricane, Nor'Easter	1, 2, 4	Township Administration	Township budget	Identifies any required actions to protect the facility	$25,000	Within 3 years	Medium	LPR, SIP	PR
2021-Hardyston-007	Enhance Municipal Buildings	**Problem**: Due to the current COVID-19 pandemic, the Township has identified several areas in their buildings that could be enhanced to reduce expose to bacteria and viruses.	Existing	Disease Outbreak	1, 2, 5	Township Administration	Township budget	Increase protection from diseases; decrease risk of spread	$50,000+	Within 5 years	Medium	SIP	ES, PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		Solution: The Township will upgrade the bathroom facilities in the town hall, EMS, police station, and fire department to touchless toilets and sinks. This will reduce exposure to germs and provide safer environments for municipal staff.											
2021-Hardyston-008	Develop Debris Management Plan	**Problem**: The Township currently does not have an adopted debris management plan. Without a plan in place, there are no identified resources in place to properly address debris and do not have identified locations for debris storage. **Solution:** The Township will develop a debris management plan that will assist the municipality when they need to facilitate response and recovery after a debris-causing incident. The plan will provide direction to facilitate and coordinate the management of debris following a disaster.	Existing	Flood, Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather, Wildfire	3, 5, 6	OEM, Public Works	Township budget	Increased disaster capability and preparedness	Staff time	1 year	High	LPR	ES
2021-Hardyston-009	Update Flood Damage Prevention Ordinance	**Problem**: The Township's current flood damage prevention ordinance was last adopted in 2011. It currently does not have a freeboard requirement and does not meeting New Jersey's minimum requirement. **Solution:** The Township will update its flood damage prevention ordinance to meet the New Jersey requirement of one foot of freeboard.	New and Existing	Flood	1, 2	Township Administration, Construction Official	Township budget, FEMA BRIC	Meet state standards, reduce future flood risk	Staff time	6 months	High	LPR	PR

Notes:

Acronyms and Abbreviations:
CAV Community Assistance Visit
CRS Community Rating System
DPW Department of Public Works

Potential FEMA HMA Funding Sources:
FMA Flood Mitigation Assistance Grant Program
HMGP Hazard Mitigation Grant Program
PDM Pre-Disaster Mitigation Grant Program

Timeline:
The time required for completion of the project upon implementation

Cost:

FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.12-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2021-Hardyston-001	DPW Fuel Station Generator	1	1	1	1	1	1	0	0	0	1	1	1	1	0	10	High ⚠
2021-Hardyston-002	Firewise Program	1	1	1	1	0	0	1	1	0	1	0	1	0	0	8	Medium
2021-Hardyston-003	Colson Terrace Study	1	1	1	1	1	1	0	1	0	1	1	1	1	0	11	High
2021-Hardyston-004	Engineering Study (roof) on Elementary School	1	1	1	1	0	0	0	0	0	0	0	1	0	0	5	Medium
2021-Hardyston-005	Engineering Study (windows) on Elementary School	1	1	1	1	0	0	0	0	0	0	0	1	0	0	5	Medium
2021-Hardyston-006	Engineering Study on Municipal Building	1	1	1	1	1	1	0	0	0	1	0	1	0	0	8	Medium
2021-Hardyston-007	Enhance Municipal Buildings	1	1	1	1	1	1	0	0	0	1	0	1	0	0	8	Medium
2021-Hardyston-008	Develop Debris Management Plan	1	1	1	1	1	1	0	0	0	1	1	1	1	0	10	High
2021-Hardyston-009	Update Flood Damage Prevention Ordinance	1	1	1	1	1	1	1	0	0	1	0	1	1	0	10	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.12-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure					X	X		X
Disease Outbreak	X				X	X		X
Drought					X	X		X
Earthquake					X	X		X
Flood	X				X	X	X	X
Geologic					X	X		X
Hazardous Materials					X	X		X
Hurricane and Tropical Storm	X				X	X		X
Invasive Species					X	X		X
Nor'Easter	X				X	X		X
Severe Weather	X				X	X		X
Severe Winter Weather	X				X	X		X
Wildfire	X		X		X	X		X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.
high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.12-1. Township of Hardyston Hazard Area Extent and Location Map 1

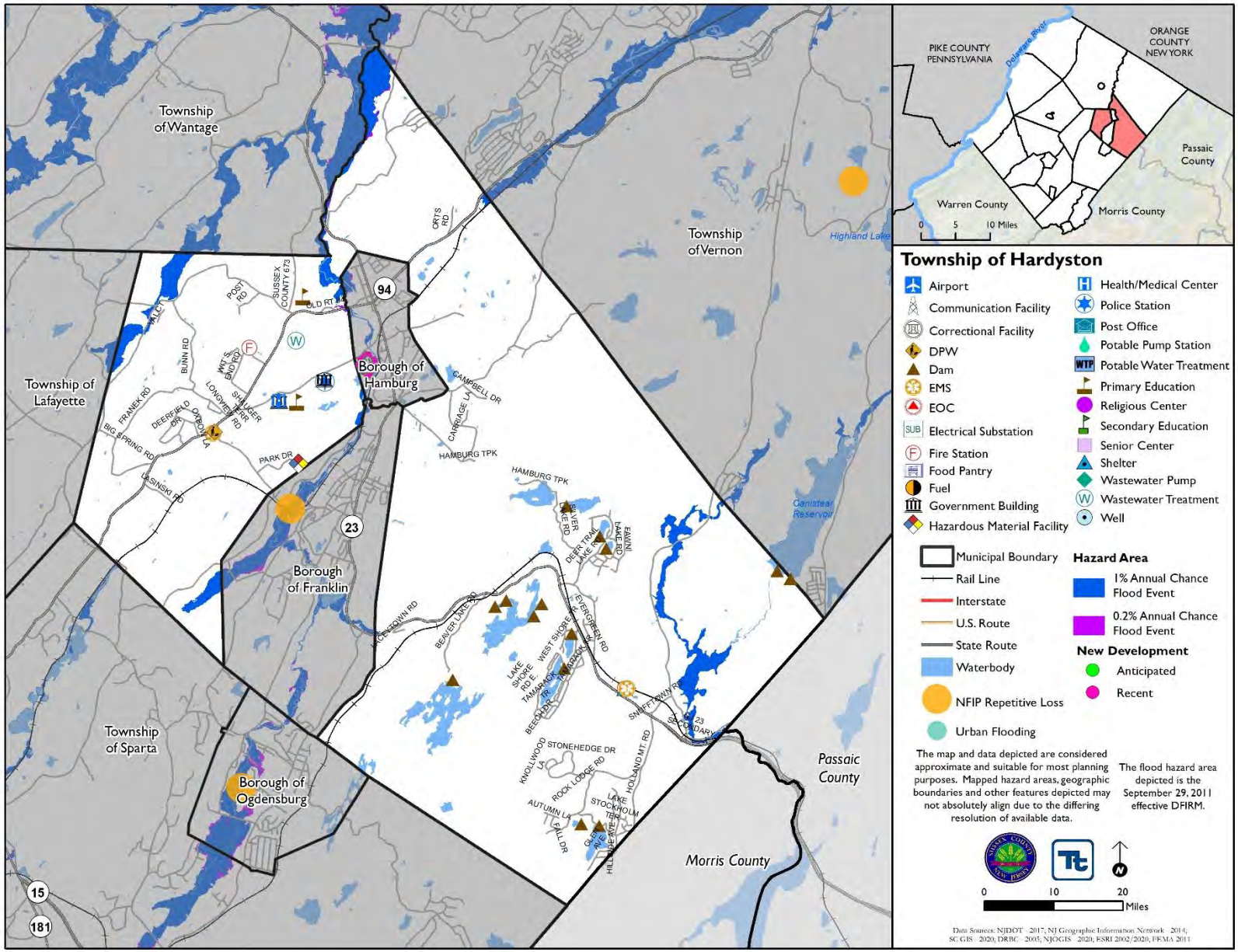


Figure 9.12-2. Township of Hardyston Hazard Area Extent and Location Map 2

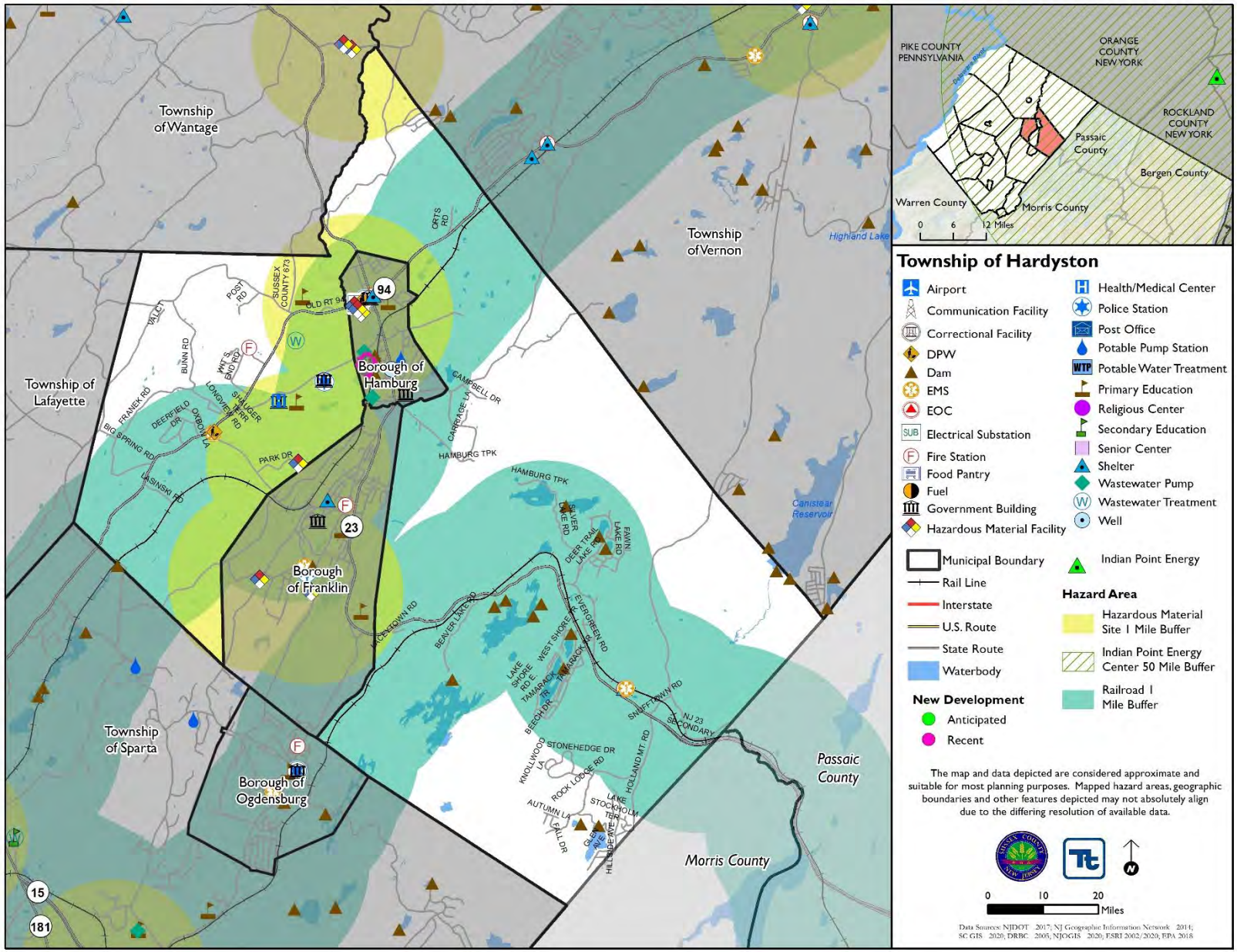
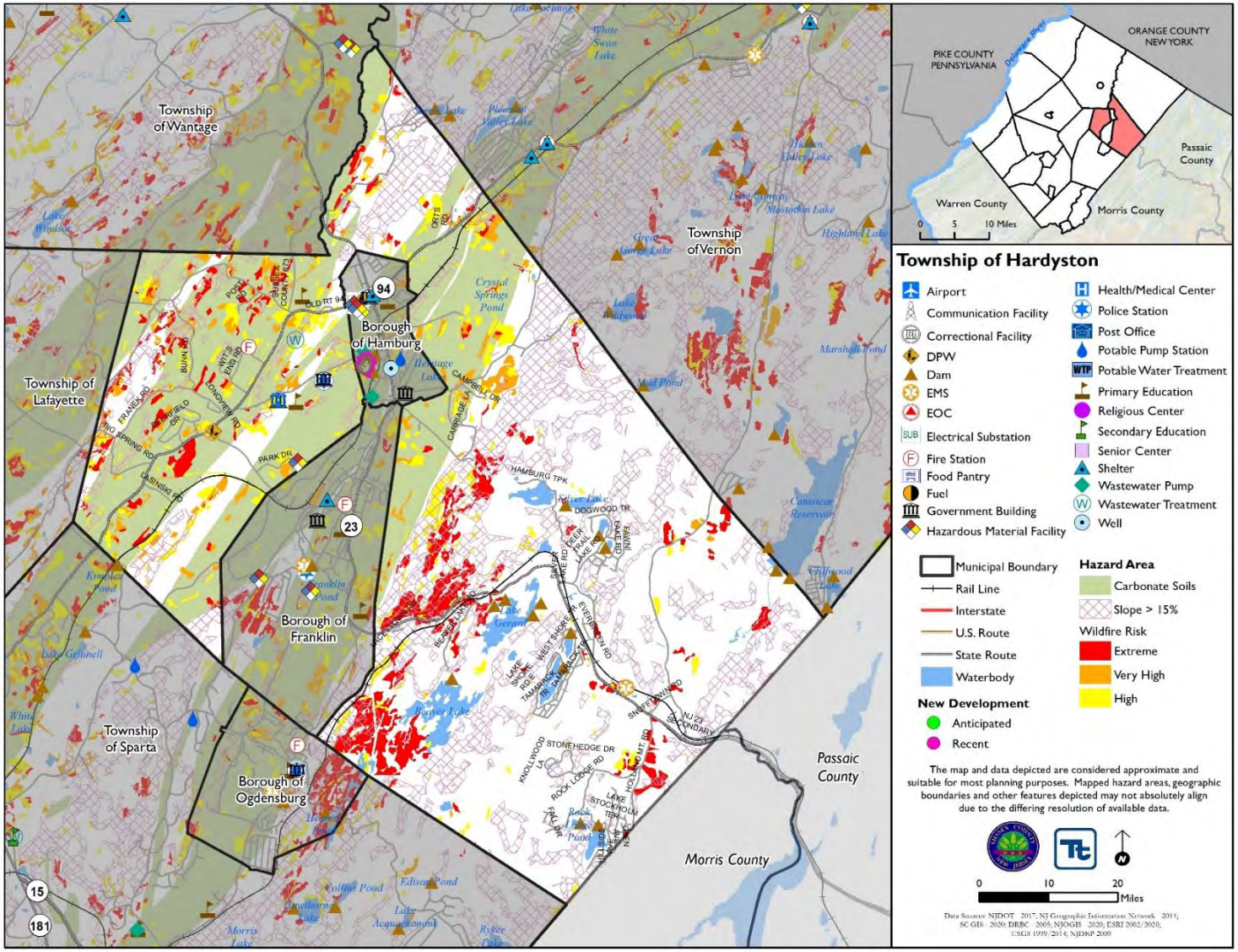


Figure 9.12-3 Township of Hardyston Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	DPW Fuel Station Generator		
Project Number:	2021-Hardyston-001		
Risk / Vulnerability			
Hazard(s) of Concern:	All		
Description of the Problem:	The Township's DPW fuel station is a critical facility and provides essential services to the community. The station currently does not have a source of backup power. In the event of a power outage, the station can fuel municipal vehicles.		
Action or Project Intended for Implementation			
Description of the Solution:	Determine the proper size permanent generator for the fuel station; once determined, purchase and install generator.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Continuity of operations; provide fuel to municipal vehicles
Useful Life:	5 years	**Goals Met:**	2, 6
Estimated Cost:	$100,000	**Mitigation Action Type:**	SIP
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 2 years
Estimated Time Required for Project Implementation:	Within 2 years	**Potential Funding Sources:**	FEMA HMGP, Township Budget
Responsible Organization:	Engineering, DPW, Township Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	N/A

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Install solar panels at fuel station	$25,000+	Weather dependent; maintenance costs
	Install wind turbine	$25,000+	Weather dependent; maintenance costs

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	DPW Fuel Station Generator	
Project Number:	2021-Hardyston-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	Provide continuity of operations; allows building to operate during power outage
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to implement this project
Fiscal	0	The Township will need funding to complete project
Environmental	0	No environmental impacts
Social	0	No social impacts
Administrative	1	
Multi-Hazard	1	All hazards
Timeline	1	To be completed within 2 years
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Colson Terrace Study		
Project Number:	2021-Hardyston-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather		
Description of the Problem:	Colson Terrace experiences storm drainage issues during periods of rain. This reduces access to this road and the facilities located there, including the EMS and fire departments.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct an engineering study to determine the drainage issues on Colson Terrace. Once study is complete and solutions are identified, obtain funding to implement best solution to alleviate the drainage issues.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Identify drainage issues and provide solutions to reduce or alleviate the problem
Useful Life:	N/A	**Goals Met:**	1, 2, 5
Estimated Cost:	$50,000+	**Mitigation Action Type:**	LPR, SIP
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 2 years
Estimated Time Required for Project Implementation:	Within 2 years	**Potential Funding Sources:**	Township Budget, FEMA BRIC and HMGP
Responsible Organization:	Engineering, DPW, Township Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	N/A
Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate buildings located along Colson Terrace	$1 million+	Costly; not feasible; not all buildings sustain flood damage
	Elevate roadway	$100,000+	Costly; can lead to access issues to buildings
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Action Worksheet		
Project Name:	Colson Terrace Study	
Project Number:	2021-Hardyston-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	Protect buildings along roadway; allow critical facilities to be accessible
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has jurisdiction to implement this project
Fiscal	0	Need grant funding to complete projects
Environmental	1	
Social	0	No social impacts
Administrative	1	The Township has the administrative capabilities to implement this project
Multi-Hazard	1	Flood, Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather
Timeline	1	Within 2 years
Agency Champion	1	
Other Community Objectives	0	
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Update Flood Damage Prevention Ordinance		
Project Number:	2021-Hardyston-009		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	The Township's current flood damage prevention ordinance was last adopted in 2011. It currently does not have a freeboard requirement and does not meeting New Jersey's minimum requirement.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will update its flood damage prevention ordinance to meet the New Jersey requirement of two feet for non-critical structures and three feet for all critical structures.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Meet state standards, reduce future flood risk
Useful Life:	N/A	**Goals Met:**	1, 2
Estimated Cost:	Minimal – staff time	**Mitigation Action Type:**	LPR
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6 months
Estimated Time Required for Project Implementation:	6 months	**Potential Funding Sources:**	Township budget, FEMA BRIC
Responsible Organization:	Township Administration, Construction Official	**Local Planning Mechanisms to be Used in Implementation if any:**	N/A

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Acquire all structures in the floodplain	$1 million+	Not feasible; loss tax base; not all properties flood
	Update Flood Damage Prevention Ordinance	Staff time	Solution selected

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Update Flood Damage Prevention Ordinance	
Project Number:	2021-Hardyston-009	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	Protect buildings located in the floodplain
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has jurisdiction to implement this project
Fiscal	1	Funded through municipal budget/staff time
Environmental	0	No environmental impacts
Social	0	No social impacts
Administrative	1	The Township has the administrative capabilities to implement this project
Multi-Hazard	0	Flood
Timeline	1	To be completed within 6 months
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	

9.13 BOROUGH OF HOPATCONG

This section presents the jurisdictional annex for the Borough of Hopatcong. The annex includes a general overview of the Borough of Hopatcong; an assessment of the Borough of Hopatcong's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.13.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Hopatcong's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.13-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Wade Crowley, OEM Coordinator Address: 111 River Styx Road, Hopatcong, NJ 07843 Phone Number: (973) 390-0988 Email: wcrowley@hopatcong.org	Name / Title: Ron Tappan, Administrator Address: 111 River Styx Road, Hopatcong, NJ 07843 Phone Number: (973) 770-1200 Email: rtappan@hopatcong.org
NFIP Floodplain Administrator	
Name / Title: William O'Connor, Construction Official Address: 111 River Styx Road, Hopatcong, NJ 07843 Phone Number: (973)770-1200 Email: woconner@hopatcong.org	

Name	Title	Method of Participation
Wade Crowley	OEM Coordinator	Primary point of contact, provided data and information, contributed to mitigation strategy; attended the risk assessment meeting and mitigation strategy workshop
Ron Tappan	Administrator	Alternate point of contact
William O'Connor	Construction Official	NFIP floodplain administrator
Samantha Anello	Engineer	Provided data and information; contributed to mitigation strategy; attended the risk assessment meeting and mitigation strategy workshop

9.13.2 Jurisdiction Profile

Hopatcong Borough is located in southwestern Sussex County. It is bordered to the north by Sparta Township, to the east and south by Morris County, and to the west by Byram Township and Stanhope Borough. The Borough has a total area of 12.4 square miles. The following unincorporated communities are located within the Borough: Northwood, Byram Cover, Sperry Springs, Bonaparte Landing, Hopatcong Hills, and Hopatcong Heights. Streams in the Borough include: the Musconetcong River which makes up the eastern border of the Borough, and Lubbers Run. A portion of Lake Hopatcong is found in eastern Hopatcong Borough.

According to the U.S. Census, the 2010 population for the Borough of Hopatcong was 15,147. The estimated 2018 population was 14,362, a 5.2 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 5.1 percent of the population is 5 years of age or younger and 13.7 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.13.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.13-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.13-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units										
Multi-Family										
Other (commercial, mixed-use, etc.)										

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
Unavailable at this time.					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Unavailable at this time.					

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.13.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Borough of Hopatcong performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Borough of Hopatcong identified specific integration

activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Borough of Hopatcong and where hazard mitigation has been integrated.

Table 9.13-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Borough is responsible for this code in compliance with State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Zoning Department is responsible for this code in compliance with Chapter 242- Zoning.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Land Use Board is responsible for this ordinance in compliance with Chapter 209- Subdivision of Land.*					
Stormwater Management	Yes	State & Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The Engineering Department is responsible for this ordinance in compliance with Chapter 242 – Zoning, Stormwater Management Requirements.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	No	State, Division of Consumer Affairs	Yes	No	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.					
Growth Management	Yes	State	Yes – if municipality has a Planning Board	No	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.* • *The Administration is responsible for these ordinances, which are due to Highlands.*					
Site Plan Review	Yes	State, County & Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Land Use Board is responsible for these requirements in compliance with Chapter 191- Site Plan Review.*					
Environmental Protection	Yes	Local	No	Yes	-
Comment: • *Chapter 143, Lawn Fertilizers* • *Chapter 147, Littering* • *Chapter 154 Natural Area Preserve*					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	2021-Hopatcong-009
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Construction Department is responsible for this ordinance in compliance with Chapter 124-Floodplain Management.* • *It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:* o *A. Protect human life and health;* o *B. Minimize expenditure of public money for costly flood control projects;* o *C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* o *D. Minimize prolonged business interruptions;* o *E. Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard;* o *F. Help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;* o *G. Ensure that potential buyers are notified that property is in an area of special flood hazard; and* o *H. Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.* • *The Flood Damage Prevention Ordinance lacks the state mandated freeboard requirement.*					
Wellhead Protection	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Emergency Management	Yes	Local	No	Yes	-
Comment: • *Chapter 17, Fire Department* • *Chapter 39, Police Department*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Municipal Separate Storm Sewer System (MS4)	Yes	Local	No	Yes	-
Comment: *The Engineering Department is responsible for this ordinance in compliance with Chapter 203 – Storm Sewer System.*					
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Yes	Local	No	Yes	-
Comment: *The Borough is responsible for these ordinances in compliance with Chapter 100 – Deer Management, Chapter 132 – Highlands, and Chapter 154 – Natural Area Preserve.*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen commissioners with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Land Use Board is responsible for this plan in compliance with 2014 Master Plan Reexamination Report.*					
Capital Improvement Plan	Yes	Local	No	Yes	-
Comment: *The Administration is responsible for this plan*					
Disaster Debris Management Plan	No	-	No	-	2021-Hopatcong-010
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	No	State & Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.					
Stormwater Pollution Prevention Plan	Yes/No	If yes, who enforces?	Yes	Yes/No	Yes/No
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Habitat Conservation Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	Yes/No	If yes, who enforces?	Yes – if located in a coastal zone	Yes/No	Yes/No
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Community Forest Management Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Climate Action Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Tourism Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Business Development Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Other: Open Space Plan	Yes	Local	No	Yes	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment: • *The Open Space Department is responsible for this plan in compliance with Open Space and Recreation Plan Update, 2011.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Office of Emergency Management is responsible for this plan in compliance with Emergency Operation Plan.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Post-Disaster Recovery Plan	Yes	Local	No	Yes	-
Comment: *The Office of Emergency Management is responsible for this plan in compliance with the Emergency Operation Plan.*					
Continuity of Operations Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Public Health Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Other Plans	Yes	State & Local	No	Yes	-
Comment: • *The Highlands Council is responsible for these plans in compliance with Borough of Hopatcong Highlands Environmental Resource Inventory, 2013.*					

Table 9.13-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes/No
Does your jurisdiction have the ability to track permits by hazard area?	Yes/No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes/No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Borough of Hopatcong.

Table 9.13-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Land Use Board
Mitigation Planning Committee	Yes	OEM
Environmental Board / Commission	Yes	Environmental Committee
Open Space Board / Committee	Yes	Open Space Board

Staff/Personnel Resource	Available?	Department/Agency/Position
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes/No	
Maintenance program to reduce risk	Yes	OEM
Mutual aid agreements	Yes	Fire Department/EMS/OEM
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Land Use Board, Engineers
Engineers or professionals trained in building or infrastructure construction practices	Yes	Borough Engineer
Planners or engineers with an understanding of natural hazards	Yes	Borough Engineer
Staff with training in benefit/cost analysis	Yes	Administrator
Staff with training in green infrastructure	Yes/No	
Staff with education/knowledge/training in low impact development	Yes/No	
Surveyor	Yes	Borough Engineer
Stormwater engineer	Yes/No	
Personnel skilled or trained in GIS applications	No	-
Local or state water quality professional	Yes/No	
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM
Watershed planner	Yes/No	
Environmental specialist	Yes/No	
Grant writers	Yes	Millennium
Resilience Officer	No	-
Other: Professionals trained in conducting damage assessments	Yes	Construction

Fiscal Capability

The table below summarizes financial resources available to the Borough of Hopatcong.

Table 9.13-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes/No
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Hopatcong.

Table 9.13-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes/No
Do you have personnel skilled or trained in website development?	Yes/No
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes, some information is available through Emergency Management and the Fire Department.
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	Yes; Facebook and Twitter
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	The Borough of Hopatcong has an Emergency Management Plan in effect, which contains procedures, resources, departments and agencies to keep the Borough in a state of readiness in case an emergency should occur, and to be implemented as need arises. Continuing review, up-dating and implementation of the Plan is the responsibility of the Emergency Management Council. The Emergency Management Council consists of ten members appointed by the Mayor. Of the ten members one is appointed Coordinator and four others as Deputies. The membership cuts across Borough Departments, Hopatcong School District, churches, and local organizations.
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Health Clinic, Fire Prevention Bureau

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Hopatcong.

Table 9.13-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	6	Approx. 2013
Public Protection (Fire ISO Protection Class)	No	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Bronze	December 16, 2020

N/A = Not Applicable. NP = Not Participating. - = Unavailable.

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of

local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.13-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Weak
Disease Outbreak	Moderate
Drought	Weak
Earthquake	Weak
Flood	Weak
Geologic	Weak
Hazardous Materials	Weak
Hurricane and Tropical Storm	Moderate
Invasive Species	Strong
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Moderate
Wildfire	Weak

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.13-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Construction Department
Who is your floodplain administrator? (name, department/position)	William O'Connor, Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	
What is the date that your flood damage prevention ordinance was last amended?	July 6, 2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets the minimum requirements.
When was the most recent Community Assistance Visit or Community Assistance Contact?	February 3, 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes

Criterion	Response
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA would welcome any continuing education or certification trainings on floodplain management if offered in the County.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No, and the community hasn't considered joining.
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	11 policies $2,807,000 insurance in force $5,849 premium in force
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	12 claims $54,193 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

Additional Areas of Existing Integration

- **Sustainable Jersey:** The Borough of Hopatcong recently was awarded Bronze certification in the Sustainable Jersey Program. The Borough earned credit in the following areas related to hazard mitigation:
  - *Community Education and Outreach:* In September 2019, the Borough had a unique town wide clean-up in which cleaned up areas that were prone to litter with stagnant water and could be infested with mosquitoes. Paige Lockburner of Sussex County Mosquito Control gave a presentation on litter and how it aids in the breeding of mosquitos as well as the life span of mosquitos themselves.
  - *Fleet Inventory:* Hopatcong's fleet is currently comprised of sedans, vans, light and heavy duty trucks, and other equipment for more specialized fire and emergency services. The Borough's trucks are maintained regularly by staff mechanics and local, specialized, automotive and truck repair businesses. The Borough conducts Motor Vehicle Records abstract reports, once a year for all full time, part time or seasonal employees and volunteers who drive a municipal or personal vehicle as part of their job responsibilities. The Borough conducts Driver's Training and Instruction both internally and externally for all DPW employees as seasons and situations are identified. Hopatcong's fleet of vehicles are continually being replaced with more fuel efficient models when available.
  - *HAB Innovative Project:* In mid-July 2020 Hopatcong Borough installed a pilot project to remedy the harmful algal blooms (HAB's) that closed Lake Hopatcong last summer and caused extreme recreational and economic distress to the area. Water and air quality around the lake was affected and found to be toxic for pets and swimmers. The 60-acre Crescent Cove section of Hopatcong is one of the most impaired HAB areas on the lake and has been battling algal blooms for years prior to last year's closing. For this reason, it was the perfect site for the pilot project. Hopatcong's mayor, Michael Francis, did considerable research and settled on a bottom-diffused aeration system of controlling algal blooms for which the borough received a $145,680 grant from the DEP to purchase/install the system to demonstrate its effectiveness in the prevention, mitigation, and control of HAB's . The project has the potential of providing the state with validated results on whether this technology offers promise for the rest of Lake Hopatcong and other bodies of water in NJ. The project uses EverBlue-Lakes micro-porous ceramic aeration diffuser technology consisting of one land-based compressor system and 38 in-lake diffusers connected by a self-sinking airline. 10 diffusers form a Bubble Curtain at the mouth of the cove to reduce surface algal scums and floating weeds by keeping them from entering the treatment

area. 28 additional diffusers are situated throughout Crescent Cove to circulate and aerate the remaining target area. Testing will be on-going and results will be accumulated and reported at the end of one year as required by the grant. The objective is to maintain Algal cell counts below the threshold of 20,000 cells/millilitre. If this pilot project is successful similar aeration systems could be installed elsewhere on LH and around NJ, and Crescent Cove will be free of HAB's.

- *Environmental Commission:* The Hopatcong Environmental Commission is one of the more active organizations in the Borough of Hopatcong. The group has had a long history of service to the town and in the last several years has become very active in organizing and promoting green events and coordinating programs that benefit the community such as Town Cleanup and Free Trees to residents through the NJ Tree Recovery Program. In addition, they have worked with the LHF on lake clean up and screening for invasive aquatic weeds. Members assist the Musconetcong Water Assoc in water testing of the Musconetcong River downstream from its headwaters of Lake Hopatcong and they have marked storm drains throughout the borough to curb dumping.
- *Tree Protection Ordinance:* The ordinance prohibits the uncontrolled destruction, removal and cutting of trees and takes into consideration the protection of old growth forests, trees of historical and botanical rarity.

Opportunities for Future Integration

- **Flood Damage Prevention Ordinance:** The Borough will update the Flood Damage Prevention Ordinance to include freeboard (2021-Hopatcong-003).

9.13.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Borough of Hopatcong's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.13-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.13-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Although the County was impacted, the Borough did not report damages.
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	The Borough was subject to closures and masking and social distancing requirements.
August 4, 2020	Tropical Storm Isaias (Declaration to be determined)	Yes	Tropical Storm Isaias	High winds resulted in falling trees and branches.

Source: FEMA 2020, NOAA NCEI 2020

9.13.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Borough of Hopatcong risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Hopatcong that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Hopatcong has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Hopatcong.

- Number of repetitive loss (RL) properties: 1
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.13-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
22-247 Dallis Pond Dam	Dam	X	X
25-42 Lake Hopatcong	Dam	X	X

Source: Sussex County Planning Partnership 2020
*Note: *Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- Backup power sources are necessary to maintain critical services for critical facilities. The Borough has entered into a mutual aid agreement with the St. Jude Church Parish to be an emergency shelter. The Parish lacks a backup power source.
- A new chipper is needed to help with storm clean up as most storms cause tree and utilities damage in the Borough.
- Nutrients entering the lake through stormwater contribute to harmful algal blooms. Harmful algal blooms present a health concern and are damaging to the environment.

- The Borough requires an upgraded radio system that can be used by all our emergency services to better coordinate emergency response in the town during storms and other emergencies.
- The Ambulance Squad building is over 40 years old and is deteriorating.
- The Borough has one unmitigated repetitive loss property.
- The Borough would like to enhance existing outreach and develop additional hazard outreach.
- The Borough's flood damage prevention ordinance lacks the state mandated freeboard requirement.
- The Borough lacks a Disaster Debris Management Plan.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Borough of Hopatcong ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Borough of Hopatcong. The Borough of Hopatcong has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Borough of Hopatcong indicated the following reasons why hazard rankings have changed since the 2016 HMP:

- The Borough changed the hazard ranking for drought from medium to low.
- The Borough changed the hazard ranking for flood from medium to low.
- The Borough changed the hazard ranking for hazardous materials from medium to low.
- The Borough changed the hazard ranking for invasive species from medium to high.
- The Borough agreed with the remainder of the calculated hazard rankings.

Table 9.13-13. Borough of Hopatcong Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Low	Low	Low	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Low	High	High	High	High	High	Low

9.13.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.13-15 and Table 9.13-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as

such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.13-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Hopatcong-1 (new)	Ensure continuity of operations at critical facilities and municipal buildings: Identified at this time, purchase and install Hopatcong Borough DPW Bldg Generators	DPW, OEM	In Progress. All Borough buildings have generator back up power. A generator is still needed for St. Jude church Parrish center, as the Borough has entered into a mutual aid agreement with them to be an emergency shelter.	X	2021-Hopatcong-001
Hopatcong-2 (new)	Utilize the Hazard Mitigation Plan (HMP) when updating the Comprehensive Master Plan; consider including hazard identification, hazard zones risk assessment information, and hazard mitigation goals as identified in the HMP. Further, the findings and recommendation of the HMP will be considered during any future site plan review processes.	Planning	Ongoing Capability		
Hopatcong-3 (new)	Offer training on best practices for hazard mitigation and hazard identification for Borough employees.	OEM Coordinator	Ongoing Capability		
Hopatcong-4 (old #1)	Retrofit the windows on Hudson Maxim School located on River Styx Road to meet high wind standards.	Borough Administration	No longer a concern as the building is being sold.		
Hopatcong-5 (old #2)	Retrofit roof to meet current snow load standards on Hopatcong Municipal Facility located on River Styx Road.	Borough Administration	Complete. New roof has been installed on the building.		
Hopatcong-6 (revised old #6)	The Borough will work with the NJDEP to alleviate flooding of the small stream that flows through the area of Flora Avenue between Durban and Wills Avenue.	Borough Administration, NJDEP	Complete. DPW worked with the County and the stream bed has been dredged to alleviate flooding concerns.		
Hopatcong-7 (old #8)	Enhance the current all-hazards public education and outreach program by developing, implementing and facilitating a multi-hazard public awareness program. Provide information on all types of hazards, preparedness and mitigation measures via the	OEM with support from County OEM	In Progress	X	2021-Hopatcong-008

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
	Borough website and social media.				
Hopatcong-8 (new)	Upgrade radio communication and pagers for fire department	Fire Department	In Progress. Fire Department pagers have been purchased, but the radio frequency used by the Fire Department is being phased out for emergency services by the FCC. A project is in the works to bring all the Borough emergency services onto one radio system.	X	2021-Hopatcong-005

In addition to the above progress, the Borough of Hopatcong identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- HAB innovated project (see above in integration section).

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Hopatcong participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Hopatcong participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.13-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Hopatcong would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.13-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.13-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Hopatcong-001	St. Jude Parrish Center Backup Power	**Problem**: Backup power sources are necessary to maintain critical services for critical facilities. The Borough has entered into a mutual aid agreement with the St. Jude Church Parish to be an emergency shelter. The Parish lacks a backup power source. **Solution:** The Engineer will research what size generator is needed to power the Parish. The Borough will then assist with the purchase and installation of the selected generator and necessary electrical components to supply backup power to the shelter.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter	1, 2, 6	Administration, Engineer, St Jude Parish	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Ensures continuity of operations of sheltering location	$50,000	3 years	High	SIP	ES
2021-Hopatcong-002	Woodchipper	**Problem**: A new chipper is needed to help with storm clean up as most storms cause tree and utilities damage in the Borough. **Solution:** The Borough will purchase a new woodchipper and train staff in its use. The Borough	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter	5	Public Works	Borough Budget	Increased capability for storm response and cleanup	$5,000	1 year	High	SIP	ES
2021-Hopatcong-003	Filters for Lakeside Storm Drains	**Problem:** Nutrients entering the lake through stormwater contribute to harmful algal blooms. **Solution:** The Borough will purchase and install filters on storm drains. Public Works will be in charge of the installation and maintenance of these filters.	Existing	Severe Weather, Infestation and Invasive Species	2	Public Works	HMGP, BRIC, Borough budget	Reduction in harmful algal blooms	Medium	2 years	High	SIP	SP, NR
2021-Hopatcong-004	Harmful Algal Bloom Control	**Problem**: Harmful algal blooms present a health concern and are damaging to the environment. **Solution:** The Administration will work with the NJDEP to gain approval to introduce albino carp into the lake to eat plant life that contributes to harmful algae blooms.	N/A	Infestation and Invasive Species	2	Administration	NJ DEP grants, environmental grants	Reduction in harmful algal blooms			High	NSP	NR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Hopatcong-005	Radio System	**Problem**: The Borough requires an upgraded radio system that can be used by all our emergency services to better coordinate emergency response in the town during storms and other emergencies. **Solution:** The Borough will purchase an upgraded radio system that will be able to be used into the future.	N/A	All Hazards	6	Emergency Management	Emergency Management Performance Grants (EMPG) Program, Borough Budget	Coordinated emergency response	Medium	2 years	High	LPR	ES
2021-Hopatcong-006	Ambulance Squad Building	**Problem**: The Ambulance Squad building is over 40 years old and deteriorating. **Solution:** The Borough will construct a new building for the Ambulance Squad with modern standards for construction of critical facilities.	Existing	All Hazards	1, 2, 6	Administration, Engineer, Ambulance Squad	FEMA HMGP, BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Borough Budget	Critical facility protected from damages	High	Within 5 years	High	SIP	PR
2021-Hopatcong-007	Repetitive Loss Mitigation	**Problem**: Frequent flooding events have resulted in damages to residential properties. These properties have been repetitively flooded as documented by paid NFIP claims. The Borough has one repetitive loss property but other properties may be impacted by flooding as well. **Solution:** Conduct outreach to 5 flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating	Existing	Flood, Severe Weather	2	NFIP Floodplain Administrator, supported by homeowners	FEMA HMGP and FMA, local cost share by residents	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood	$400,000	3 years	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		residential homes in the flood prone areas that experience frequent flooding (high risk areas).						storage.					
2021-Hopatcong-008	Hazard Outreach Enhancement	**Problem**: The Borough would like to enhance existing outreach and develop additional hazard outreach. **Solution:** The Borough will enhance the current all-hazards public education and outreach program by developing, implementing and facilitating a multi-hazard public awareness program. Provide information on all types of hazards, preparedness and mitigation measures via the Borough website and social media.	Existing	All Hazards	3	Administration	Borough budget	Increased public awareness and preparedness	Staff time	1 year	High	EAP	PI
2021-Hopatcong-009	Flood Damage Prevention Ordinance Update	**Problem:** The Borough's Flood Damage Prevention Ordinance lacks the state mandated freeboard requirement. **Solution:** The Borough will update the Flood Damage Prevention Ordinance to include the freeboard requirement.	New	Flood	2	FPA, Administration	Borough budget	Meet state standards, reduce future flood risk	Staff time	6 months	High	LPR	PR
2021-Hopatcong-010	Disaster Debris Management Plan	**Problem**: The Borough lacks a Disaster Debris Management Plan. **Solution:** The Borough will develop and adopt a Disaster Debris Management Plan.	Existing	All Hazards	5	Public Works, Emergency Management	Borough budget	Increased planning and capabilities	Staff time	1 years	High	LPR	ES

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC	*Building Resilient Infrastructure and Communities Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.13-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Hopatcong-001	St. Jude Parrish Center Backup Power	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High ⚠
2021-Hopatcong-002	Woodchipper	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High
2021-Hopatcong-003	Filters for Lakeside Storm Drains	0	1	1	1	1	1	0	1	1	1	1	1	1	1	12	High
2021-Hopatcong-004	Harmful Algal Bloom Control	0	1	1	1	1	1	0	0	1	1	1	1	1	1	11	High
2021-Hopatcong-005	Radio System	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2021-Hopatcong-006	Ambulance Squad Building	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Hopatcong-007	Repetitive Loss Mitigation	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2021-Hopatcong-008	Hazard Outreach Enhancement	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-Hopatcong-009	Flood Damage Prevention Ordinance Update	0	1	1	1	1	1	1	1	1	1	0	1	1	1	12	High
2021-Hopatcong-010	Disaster Debris Management Plan	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.13-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure	X		X		X			X
Disease Outbreak	X		X		X			X
Drought	X		X		X			X
Earthquake	X		X		X			X
Flood	X	X	X		X			X
Geologic	X		X		X			X
Hazardous Materials	X		X		X			X
Hurricane and Tropical Storm	X		X		X			X
Invasive Species	X		X	X	X			X
Nor'Easter	X		X		X			X
Severe Weather	X	X	X		X			X
Severe Winter Weather	X		X		X			X
Wildfire	X		X		X			X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard

ORANGE medium ranked hazard

YELLOW low ranked hazard

Figure 9.13-1. Borough of Hopatcong Hazard Area Extent and Location Map 1

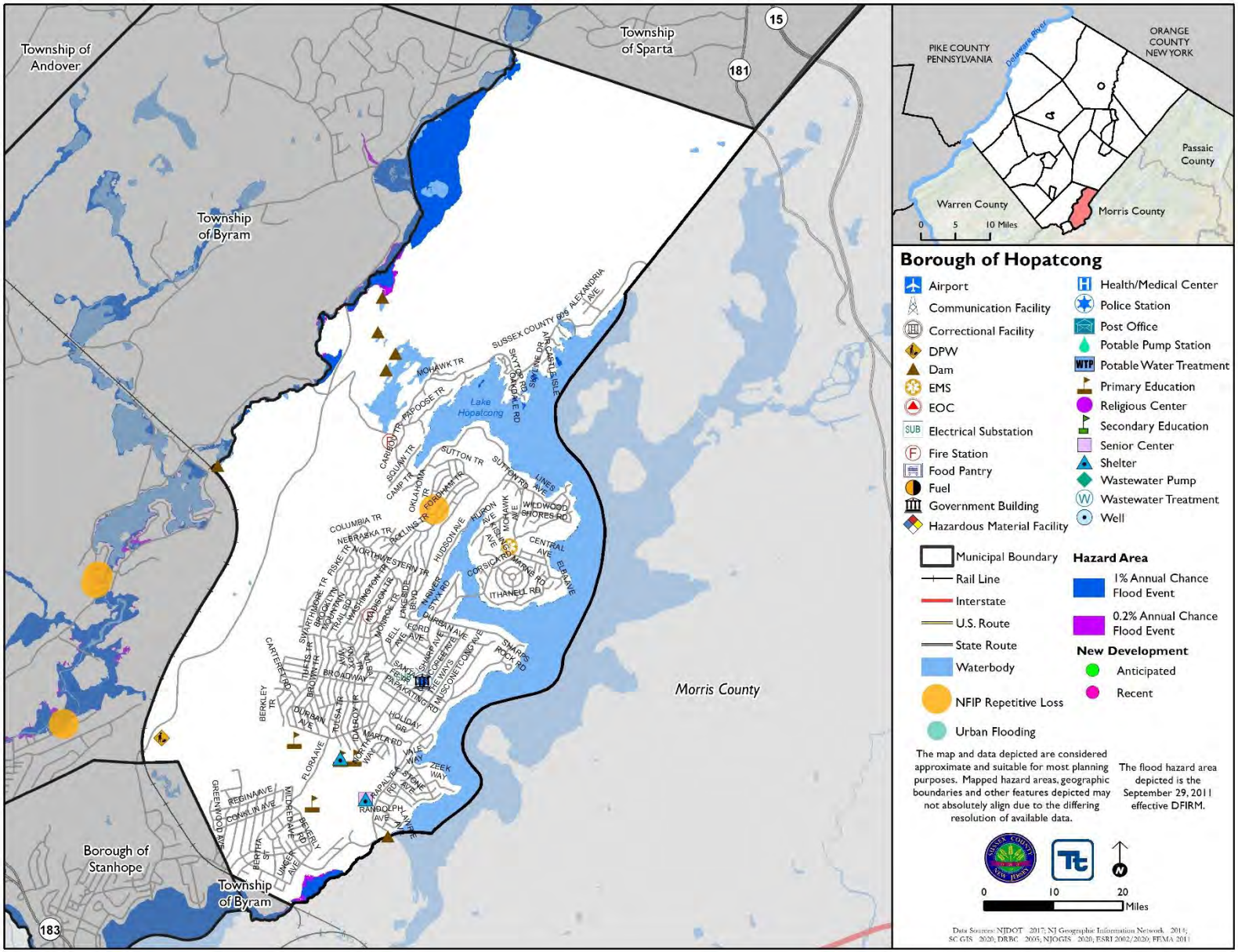


Figure 9.13-2. Borough of Hopatcong Hazard Area Extent and Location Map 2

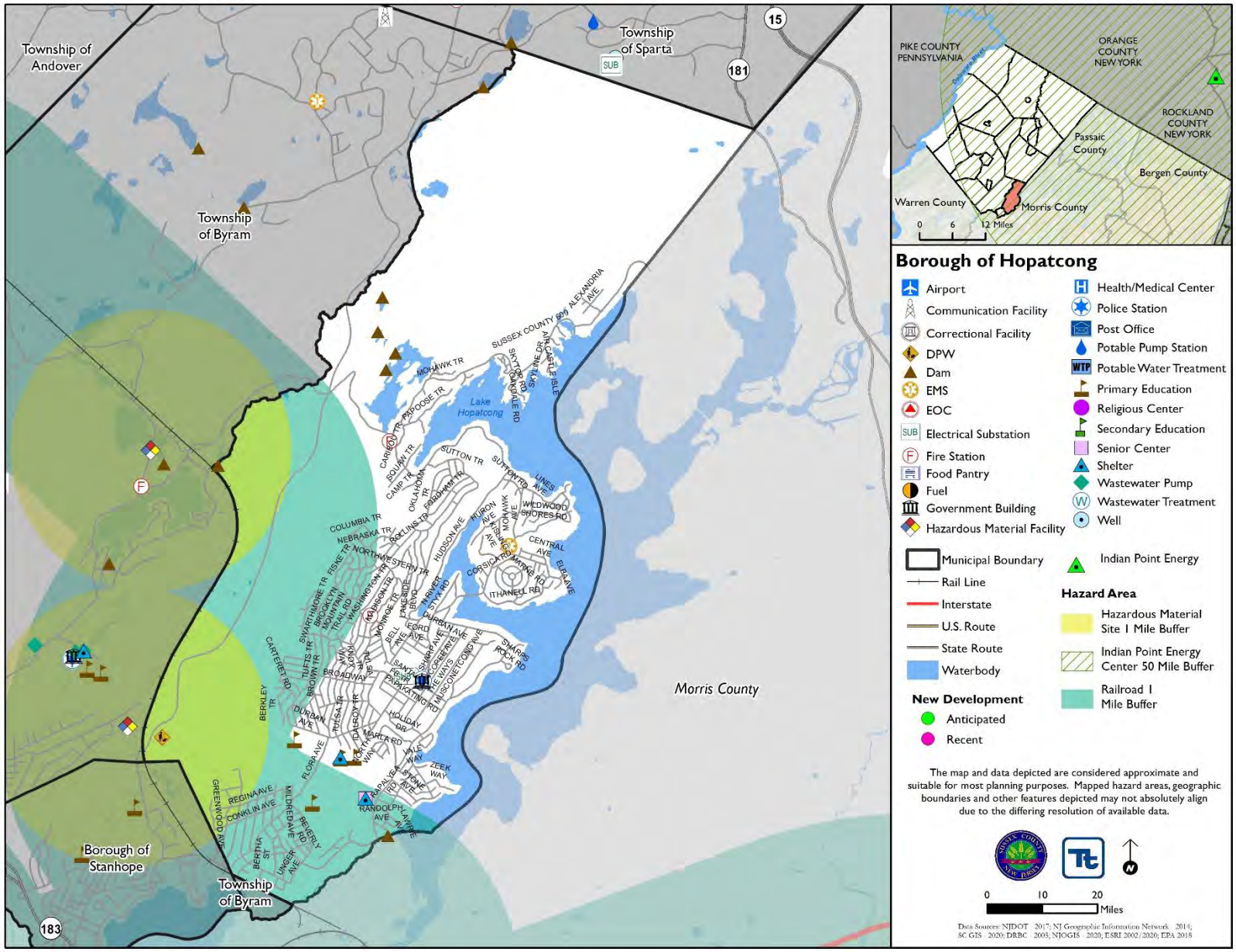
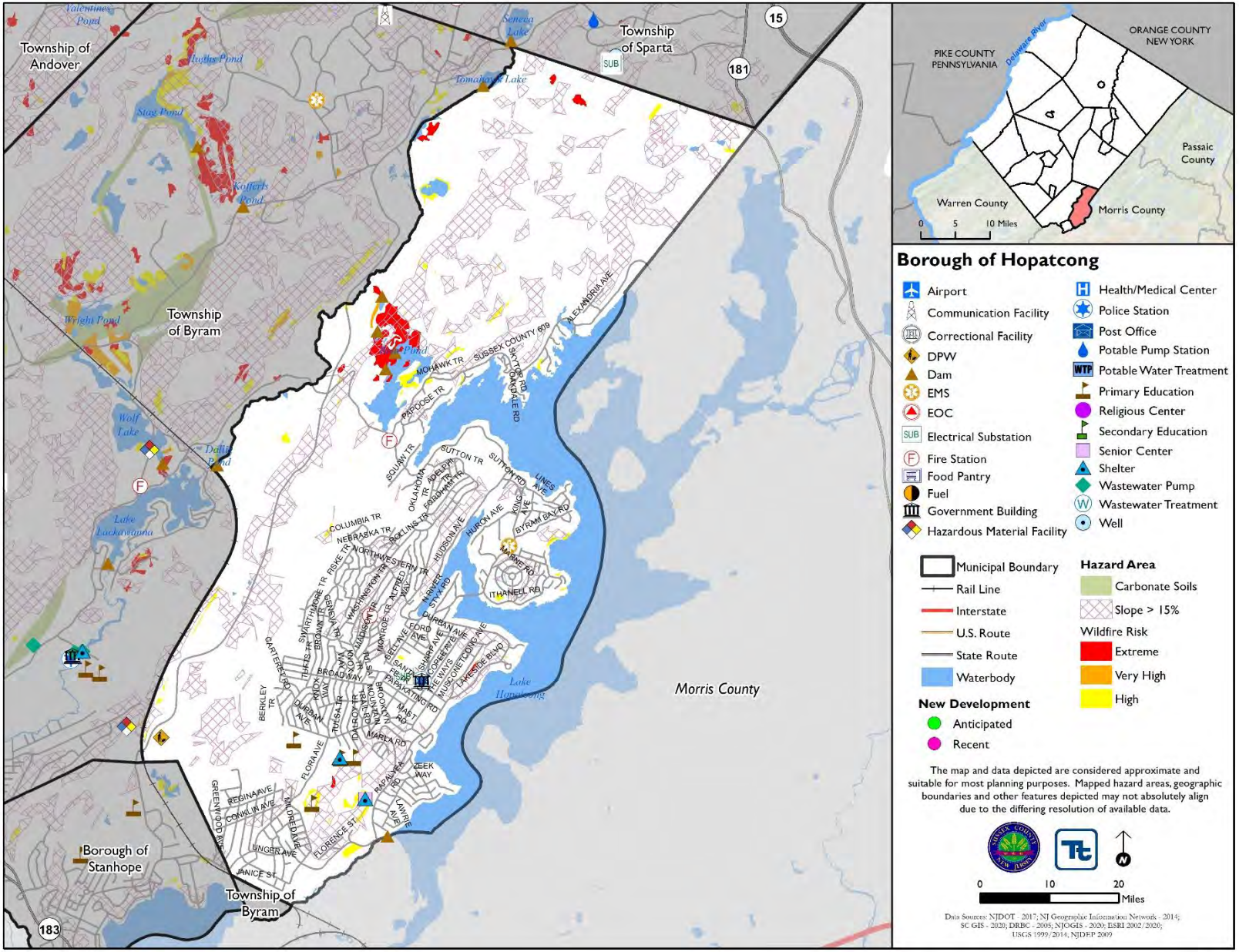


Figure 9.13-4 Borough of Hopatcong Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Public Works Maintenance Building Backup Power		
Project Number:	2021-Hopatcong-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. The Borough has entered into a mutual aid agreement with the St. Jude Church Parish to be an emergency shelter. The Parish lacks a backup power source.		
Action or Project Intended for Implementation			
Description of the Solution:	The Engineer will research what size generator is needed to power the Parish. The Borough will then assist with the purchase and installation of the selected generator and necessary electrical components to supply backup power to the shelter.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of sheltering location
Useful Life:	20 years	**Goals Met:**	1, 2, 6
Estimated Cost:	$50,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 3 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Administration, Engineer, St Jude Parish	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Public Works Maintenance Building Backup Power	
Project Number:	2021-Hopatcong-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of the shelter at the St. Jude Church Parish.
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	0	Within 3 years
Agency Champion	1	Administration, Engineer, St Jude Parish
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Filters for Lakeside Storm Drains		
Project Number:	2021-Hopatcong-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Infestation and Invasive Species		
Description of the Problem:	Nutrients entering the lake through stormwater contribute to harmful algal blooms.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will purchase and install filters on storm drains. Public Works will be in charge of the installation and maintenance of these filters.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	Reduction in nutrients in stormwater	**Estimated Benefits (losses avoided):**	Reduction in harmful algal blooms
Useful Life:	5 years	**Goals Met:**	2
Estimated Cost:	Medium	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	2 years
Estimated Time Required for Project Implementation:	3 months	**Potential Funding Sources:**	HMGP, BRIC, Borough budget
Responsible Organization:	Public Works	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, Stormwater management
Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Build large detention basins to catch all runoff	High	Costly
	Build nutrient filtration systems for all stormwater pipes	High	Costly
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Action Worksheet		
Project Name:	Filters for Lakeside Storm Drains	
Project Number:	2021-Hopatcong-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Properties protected from flooding
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Borough has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Infestation and Invasive Species
Timeline	1	2 years
Agency Champion	1	Public Works
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Ambulance Squad Building		
Project Number:	2021-Hopatcong-006		
Risk / Vulnerability			
Hazard(s) of Concern:	All Hazards		
Description of the Problem:	The Ambulance Squad building is over 40 years old and deteriorating.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will construct a new building for the Ambulance Squad with modern standards for construction of critical facilities.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	500-year storm event	**Estimated Benefits (losses avoided):**	Critical facility protected from damages
Useful Life:	15 years	**Goals Met:**	2, 6
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP, BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Borough Budget
Responsible Organization:	Administration, Engineer, Ambulance Squad	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Rebuild facility to new standards	High	Costly and not necessary
	Build secondary facility protected to new standards	High	Costly and not necessary

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Ambulance Squad Building	
Project Number:	2021-Hopatcong-006	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Ambulance Squad Building
Property Protection	1	Project will protect Ambulance Squad Building from future damages.
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	All Hazards
Timeline	0	Within 5 years
Agency Champion	1	Administration, Engineer, Ambulance Squad
Other Community Objectives	1	Protection of critical services
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Repetitive Loss Mitigation		
Project Number:	2021-Hopatcong-007		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe weather		
Description of the Problem:	Frequent flooding events have resulted in damages to residential properties. These properties have been repetitively flooded as documented by paid NFIP claims. The Borough has one repetitive loss property but other properties may be impacted by flooding as well.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to 5 flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone areas that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	2
Estimated Cost:	$400,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Three years	**Potential Funding Sources:**	FEMA HMGP and FMA, local cost share by residents
Responsible Organization:	NFIP Floodplain Administrator, supported by homeowners	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$500,000	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$500,000	Elevated roadways would not protect the homes from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Repetitive Loss Mitigation	
Project Number:	2021-Hopatcong-007	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Borough has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would remove families from the flood prone areas of the Borough.
Administrative	0	
Multi-Hazard	1	Flood, Severe weather
Timeline	0	
Agency Champion	1	NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

9.14 TOWNSHIP OF LAFAYETTE

This section presents the jurisdictional annex for the Township of Lafayette. The annex includes a general overview of the Township of Lafayette; an assessment of the Township of Lafayette's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.14.1 Hazard Mitigation Planning Team

The following individuals are the Township of Lafayette's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.14-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Richard Hughes, Committeeman/Emergency Management Coordinator Address: 33 Morris Farm Road, Lafayette, NJ 07848 Phone Number: (973) 985-5971 Email: hughesr22@gmail.com	Name / Title: Bill Macko, Road Foreman/Roads Address: 33 Morris Farm Road, Lafayette, NJ 07848 Phone Number: (973) 841-0415 Email: ltrd@ptd.net
NFIP Floodplain Administrator	
Name / Title: Debra Card, Zoning Officer/Zoning Address: 33 Morris Farm Road, Lafayette, NJ 07848 Phone Number: (973) 383-1817 x12 Email: zoning@lafayettetwp.org	

Name	Title	Method of Participation
Richard Hughes	Committeeman/Emergency Management Coordinator	Primary point of contact; attended the kickoff meeting, annex training, risk assessment meeting and mitigation strategy workshop; provided data and information for the annex update
Bill Macko	Road Foreman/Roads	Alternate point of contact
Debra Card	Zoning Officer/Zoning	NFIP Floodplain Administrator

9.14.2 Jurisdiction Profile

Lafayette Township is centrally located in Sussex County. It is bordered to the north by Wantage Township, to the east by Hardyston Township, to the south by Sparta and Andover Townships, and to the west by Frankford and Hampton Townships. The Township covers a total area of approximately 18.0 square miles. The following unincorporated communities are located within the Township: Harmonyville, Hopkins Corner, Warbasse, and Branchville Junction. There are many small ponds located throughout the Township and the Paulins Kill flows through the southwestern corner of the Township.

According to the U.S. Census, the 2010 population for the Township of Lafayette was 2,538. The estimated 2018 population was 2,390, a 5.8 percent increase from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 5.4 percent of the population is 5 years of age or younger and 18.2 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.14.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.14-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.14-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units										
Multi-Family										
Other (commercial, mixed-use, etc.)										

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
Not available at this time.					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Not available at this time.					

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.14.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Lafayette performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Lafayette identified specific integration

activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Lafayette and where hazard mitigation has been integrated.

Table 9.14-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Building Department and Construction Official are responsible for this code in compliance with State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.) and Chapter 8 – Building and Housing.*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Zoning Officer is responsible for this code in compliance with Chapter 13- Zoning.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Land Use Board is responsible for this ordinance in compliance with Chapter 12 – Land Use; Chapter 14 – Land Use Procedures.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The DPW is responsible for this ordinance in compliance with Chapter 21- Stormwater Control.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	No	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	Yes – if municipality has a Planning Board	No	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Site Plan Committee is responsible for these requirements in compliance with Chapter 12- Land Use.*					
Environmental Protection	Yes	Local	No	No	-
Comment: • *Chapter 10, Soil and Soil Removal sets the permitting and procedural requirements for soil removal and fill.*					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	-
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Construction Official is responsible for this ordinance in compliance with Chapter 17- Flood Damage Prevention.* • *The ordinance was last updated in August 2020.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	Yes	Local	No	-	-
Comment: • *Chapter 3 Police Regulations*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Yes	Local	No	Yes	-
Comment: • *These ordinances follow Ridgeline Preservation.*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen commissioners with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Planning Board is responsible for this plan, which was adopted in 2012.*					
Capital Improvement Plan	Yes	Local	No	Yes	-
Comment: *The Township Committee is responsible for this plan, which is part of the municipal budget- put away funding for these projects; reviewed/ updated annually.*					
Disaster Debris Management Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The Emergency Management/ Engineering Departing is responsible for this plan, which is reviewed annually.*					
Stormwater Pollution Prevention Plan	Yes/No	If yes, who enforces?	Yes	Yes/No	Yes/No
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	Yes/No	Yes/No	No	Yes/No	Yes/No

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Habitat Conservation Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Economic Development Plan	Yes	Local	No	Yes	-
Comment: *The Economic Development Subcommittee (Township Committee, Planning Board) are responsible for this plan. The subcommittee was created in 2015.*					
Shoreline Management Plan	Yes/No	If yes, who enforces?	Yes – if located in a coastal zone	Yes/No	Yes/No
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Community Forest Management Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Transportation Plan	Yes	Local	No	Yes	-
Comment: *This plan is included in the Master Plan.*					
Agriculture Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Climate Action Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Tourism Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Business Development Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Other: Open Space Plan	Yes	Local	No	Yes	-
Comment: • *The Open Space Commission and Township Committee are responsible for this plan, which is reviewed annually.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Office of Emergency Management is responsible for this plan, which was reviewed in 2013.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	2020-Lafayette-007
Comment:					
Continuity of Operations Plan	Yes/No	Yes/No	No	Yes/No	Yes/No

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Public Health Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Other	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					

Table 9.14-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes/No
Does your jurisdiction have the ability to track permits by hazard area?	Yes/No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes/No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Lafayette.

Table 9.14-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Land Use Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	No	-
Open Space Board / Committee	Yes	Open Space Advisory Committee; Recreation Committee
Economic Development Commission / Committee	Yes	In progress of developing – Economic Development Subcommittee
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes/No	
Maintenance program to reduce risk	Yes	DPW maintains tree trimming, culvert cleaning/repairs
Mutual aid agreements	Yes	Surrounding communities
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Municipal Engineer and Planner – contracted and appointed each year
Engineers or professionals trained in building or infrastructure construction practices	Yes	Municipal Engineer and Planner – contracted and appointed each year
Planners or engineers with an understanding of natural hazards	Yes	Municipal Engineer and Planner – contracted and appointed each year
Staff with training in benefit/cost analysis	Yes	Contracted
Staff with training in green infrastructure	Yes/No	
Staff with education/knowledge/training in low impact development	Yes/No	

Staff/Personnel Resource	Available?	Department/Agency/Position
Surveyor	Yes	Contracted when needed
Stormwater engineer	Yes/No	
Personnel skilled or trained in GIS applications	No	-
Local or state water quality professional	Yes/No	
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	
Watershed planner	Yes/No	
Environmental specialist	Yes/No	
Grant writers	Yes	Contracted
Resilience Officer	Yes/No	
Other: NFIP Floodplain Administrator	Yes	Construction Official
Other: Professionals trained in conducting damage assessments	Yes	Part of emergency management

Fiscal Capability

The table below summarizes financial resources available to the Township of Lafayette.

Table 9.14-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	No
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	Yes/No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes/No
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Lafayette.

Table 9.14-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes/No
Do you have personnel skilled or trained in website development?	Yes/No
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes/No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	Yes/No

Criterion	Response
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	Yes/No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes/No

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Lafayette.

Table 9.14-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	?	?
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.14-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

- Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality? Yes/No – if yes, describe briefly
- Is the administrative supportive of integrating climate change in policies or actions? Yes/No – if yes, describe briefly
- Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality? Yes/No – if yes, describe briefly

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.14-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineering
Who is your floodplain administrator? (name, department/position)	Nevitt Duveneck, Municipal Engineer
Are any certified floodplain managers on staff in your jurisdiction?	???
What is the date that your flood damage prevention ordinance was last amended?	???
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements set by FEMA and the State.
When was the most recent Community Assistance Visit or Community Assistance Contact?	January 27, 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	???
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	???
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA would consider attending continuing education and/or certification training on floodplain management if it were offered in the County.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No, and the community has not considered joining the program.
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	3 policies $770,000 insurance in force $1,544 premium in force
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	7 claims $24,566
Do you maintain a list of properties that have been damaged by flooding?	Yes
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
References: FEMA 2020

Additional Areas of Existing Integration

- Placeholder for areas of additional integration regarding committees/departments that tie to mitigation capability. Bulleted list.

Opportunities for Future Integration

- Placeholder for areas of integration regarding new/modified plans/ordinances, staffing, committees/departments, etc. which can be identified as mitigation actions. Bulleted list and identify mitigation action number.

9.14.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Lafayette's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.14-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.14-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	???
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	???

Source: FEMA 2020, NOAA NCEI 2020
Note:

9.14.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Lafayette risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Lafayette that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Lafayette has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Lafayette.

- Number of repetitive loss (RL) properties: 1
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.14-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
22-15 Old Culvers Dam	Dam	X	X

Source: Sussex County Planning Partnership 2020

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- Loss of Power which regularly impacts the Municipal Town Hall and the Fire department buildings during severe weather. Budgets and unavailability of natural gas have been obstacles.
- The Township has budgetary constraints with hiring additional staff, procuring new equipment, or contracting 3rd party consultants to mitigate, monitor, or correct a hazard.
- The Township has budgetary constraints with design and installation of infrastructure improvements to mitigate a hazard.
- The Township does not have subject matter expertise in house within municipality for mitigating a hazard or more detailed planning for the hazard.
- The Township does not have the emergency response resources (as all volunteer) to be trained and available at all times. Reliance on mutual aid, for profit, and county emergency response resources.
- Flooding and lack of suitably sized equipment for more effective water removal from public areas, businesses, and resident homes increases flood risk.
- Traffic diversion is caused by flooding and debris results in increased traffic on local roads, closed businesses, and displaced residents from homes.
- Timely cleanup and removal of debris following a storm over a period of several days can overwhelm internal DPW resources, both manpower and equipment.
- The Township has one repetitive loss property which is the municipal park. There are improvements which can be implemented to the Paulinskill brook to prevent the magnitude of water backing up at the Rt 15 bridge and backflowing into the park and recreation area.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Lafayette ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Lafayette. The Township of Lafayette has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Lafayette indicated the following reasons why hazard rankings have changed since the 2016 HMP:

- The Township changed the hazard ranking for hazardous materials from medium to high. Two major highways traverse Lafayette, county roads also – major routes for hazardous materials carriers, Lafayette has limited response capabilities. If the state highway or county road is shutdown (as has happened in the past) then detours go on local roads.
- The Township agreed with the remainder of the calculated hazard rankings.

Table 9.14-13. Township of Lafayette Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Low	Medium	Medium	Low	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
High	High	Medium	High	High	High	Low

9.14.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.14-15 and Table 9.14-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.14-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Lafayette-1 (new)	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss	Engineering via NFIP FPA with NJOEM, FEMA support	In Progress	X	2021-Lafayette-003

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
	properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.				
Lafayette-2 (new)	Purchase and install generators at the following locations: • Township municipal building Township elementary school	OEM, Township Committee	In Progress	X	2021-Lafayette-001
Lafayette-3 (new)	Work with the State of New Jersey to alleviate the flooding of Route 15 from the Paulinskill River.	Township, State of New Jersey	In Progress	X	2021-Lafayette-003
Lafayette-4 (new)	Perform regular drainage system maintenance throughout Township. Purchase Vac-All to assist with this maintenance program.	DPW	No Progress	X	2021-Lafayette-005
Lafayette-5 (new)	Portable generators and submersible pumps to assist homeowners during periods of flooding; allows fire department to respond to more critical events	OEM, Fire Department	No Progress	X	2021-Lafayette-004
Lafayette-6 (new)	Install, reroute and increase the capability of storm drainage systems throughout the Township.	DPW			
Lafayette-7 (old #2)	When it comes time to replacing the roof of the Township DPW facility, current snow load standards will be incorporated into the design of the roof.	DPW			
Lafayette-8 (old #8)	Work with the County to upgrade culverts along Decker and Snover Roads. Due to the size of culverts, the County needs to do the work.	DPW, County Roads			
Lafayette-9 (old #12)	Continue to enhance and develop the all-hazards public education and outreach program for hazard mitigation and preparedness for the Township.	Township			

In addition to the above progress, the Township of Lafayette identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- List any other mitigation projects you completed that were not identified in the 2016 plan

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Lafayette participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Lafayette participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.14-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Lafayette would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.14-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.14-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Lafayette-001	Municipal Building Backup Generator	**Problem**: Backup power sources are necessary to maintain critical services for critical facilities. Municipal Building does not have a generator and this area has been without power for over seven days in the past. The Township has researched and have proposals for 65kW generator with sized auto transfer switch. Natural gas was extended to the municipal building in October 2019 but the size of loads and location requires larger generator and more complicated installation resulting in higher costs **Solution:** The Township will purchase and install a 65kW natural gas generator with transfer switch.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		Engineer, Public Works	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Ensures continuity of operations of Municipal Building	$35,000	Within 1 year	High	SIP	ES
2021-Lafayette-002	Fire Department Backup Generator	**Problem**: Backup power sources are necessary to maintain critical services for critical facilities. The Fire Department does not have a reliable and adequately sized emergency power generator. This section of town has been without power for more than 7 days. The Township has researched and have proposals for a 40kW generator with 400amp auto transfer switch, initial propane fueled with new tanks installed until natural gas is extended to Fire House building. **Solution:** The Township will purchase and install a 40kW generator with 400amp auto transfer switch, initial propane fueled with new tanks installed until natural gas is extended to Fire House building. When natural gas is extended to the Fire House building, the Township will modify the generator to allow for natural gas use.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		Engineer, Public Works, Fire Department	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Ensures continuity of operations of Fire Department	$26,000	Within 1 year	High	SIP	ES
2021-Lafayette-003	Paulinskill Brook Flood Study	**Problem**: Paulinskill Brook causes flooding when water backs up at the Rt 15 bridge and backflows into the park and recreation area. This has led to repetitive losses. This also results in	Existing	Flood, Severe Storm		Engineer	HMGP, BRIC, Township budget	Reduction in flooding, address	TBD by flood study	Within 5	High	SIP, NSP	SP, NR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		blocking the major state highway and shutting down travel for days, resulting in traffic diversion onto local roads. This shuts down access to businesses located in the center of town. **Solution:** The Township will conduct a flood study of the area. It is assumed that the slope and drainage in this area needs significant improvements, but this is significantly impacted by the blockage at the Rt 15 bridge which results in backflow of rising water into the park. Once the flood study is complete and has identified cost effective improvements, the Township will carry out the identified mitigation measures.						ing repetitive losses		ye ars			
2021-Lafayette-004	Portable Generators and Water Pumps	**Problem**: Flooding of public areas, businesses, and resident homes requires Township assistance for response. **Solution:** The Township will procure additional smaller generators and water transfer pumps which can be located strategically to remove flood waters and allow for homes to remain occupied and roads to remain open.	Existing	Flood, Severe Storm		OEM, Public Works	Township budget	Increased capability of	$10,000	Within 2 years	High	SIP	ES
2021-Lafayette-005	Vacuum Truck for Stormwater Cleaning	**Problem**: Traffic diversion caused by flooding and debris results in increased traffic on local roads, closed businesses, and displaced residents from homes **Solution:** The Township will purchase a vacuum truck and train staff to more efficiently and proactively clean out stormwater and catch basins throughout the year and prior to storm seasons.	Existing	Flood, Severe Storm		Public Works	Township budget	Storm water system kept functional	$100,000	Within 5 years	High	SIP	SP
2021-Lafayette-006	Equipment for Storm Debris Response	**Problem**: Timely cleanup and removal of debris following a storm over a period of several days can overwhelm internal DPW resources, both manpower and equipment. When the single piece of equipment fails during a storm event, the Township does not have the resources or equipment to respond.	N/A	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		Public Works	Township budget	Increased storm response capabilities	$100,000	Within 5 years	High	SIP	ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		Solution: The Township will purchase the appropriately sized equipment to allow for cleanup of multiple locations such as large chippers to remove large sized branches and loaders to cleanup more areas simultaneously.											
2021-Lafayette-007	Expanding Township Capabilities	**Problem**: Budgetary constraints with hiring additional staff, procuring new equipment, or contracting 3rd party consultants to mitigate, monitor, or correct a hazard. The Township does not have subject matter expertise in house within municipality for mitigating a hazard or more detailed planning for the hazard. **Solution:** The Township will ensure pre event plans are in place which rely on mutual aid agreements with municipal and county agencies / departments. The Township will also work with stakeholders who have the subject matter expertise or equipment to assess, plan for, monitor, conduct training, and as needed respond.	Both	All Hazards		Administration, OEM	Township budget	Increased capabilities for hazard response	Staff time	Within 2 years	High	LPR	PR
2021-Lafayette-008	Expanding Township Disease Outbreak Capabilities	**Problem**: The Township has limited capability to respond to disease outbreak events. **Solution:** The Township will ensure shared service agreements are in place for the resources needed to plan for the hazard, and the equipment, monitoring, PPE, etc. needed for the hazard.	N/A	Disease Outbreak		Administration, OEM	Township budget	Increased capabilities for disease outbreak response	Staff time	Within 6 months	High	LPR	PR

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC	*Building Resilient Infrastructure and Communities*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:

N/A	*Not applicable*	*A description of the estimated benefits, either quantitative and/or qualitative.*
NFIP	*National Flood Insurance Program*	
OEM	*Office of Emergency Management*	

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.14-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Lafayette-001	Municipal Building Backup Generator	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High ⚠
2021-Lafayette-002	Fire Department Backup Generator	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2021-Lafayette-003	Paulinskill Brook Flood Study	0	1	1	1	1	0	0	1	1	0	1	0	1	1	9	High
2021-Lafayette-004	Portable Generators and Water Pumps	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-Lafayette-005	Vacuum Truck for Stormwater Cleaning	0	1	1	1	1	1	1	1	1	1	1	0	1	1	12	High
2021-Lafayette-006	Equipment for Storm Debris Response	1	1	1	1	1	1	1	1	1	1	1	0	1	1	13	High
2021-Lafayette-007	Expanding Township Capabilities	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-Lafayette-008	Expanding Township Disease Outbreak Capabilities	1	0	1	1	1	1	1	0	1	1	0	1	1	1	11	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.14-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure	X							X
Disease Outbreak	X							X
Drought	X							X
Earthquake	X							X
Flood	X			X		X	X	X
Geologic	X							X
Hazardous Materials	X							X
Hurricane and Tropical Storm	X				X			X
Invasive Species	X							X
Nor'Easter	X				X			X
Severe Weather	X			X	X	X	X	X
Severe Winter Weather	X				X			X
Wildfire	X							X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.
high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.14-1. Township of Lafayette Hazard Area Extent and Location Map 1

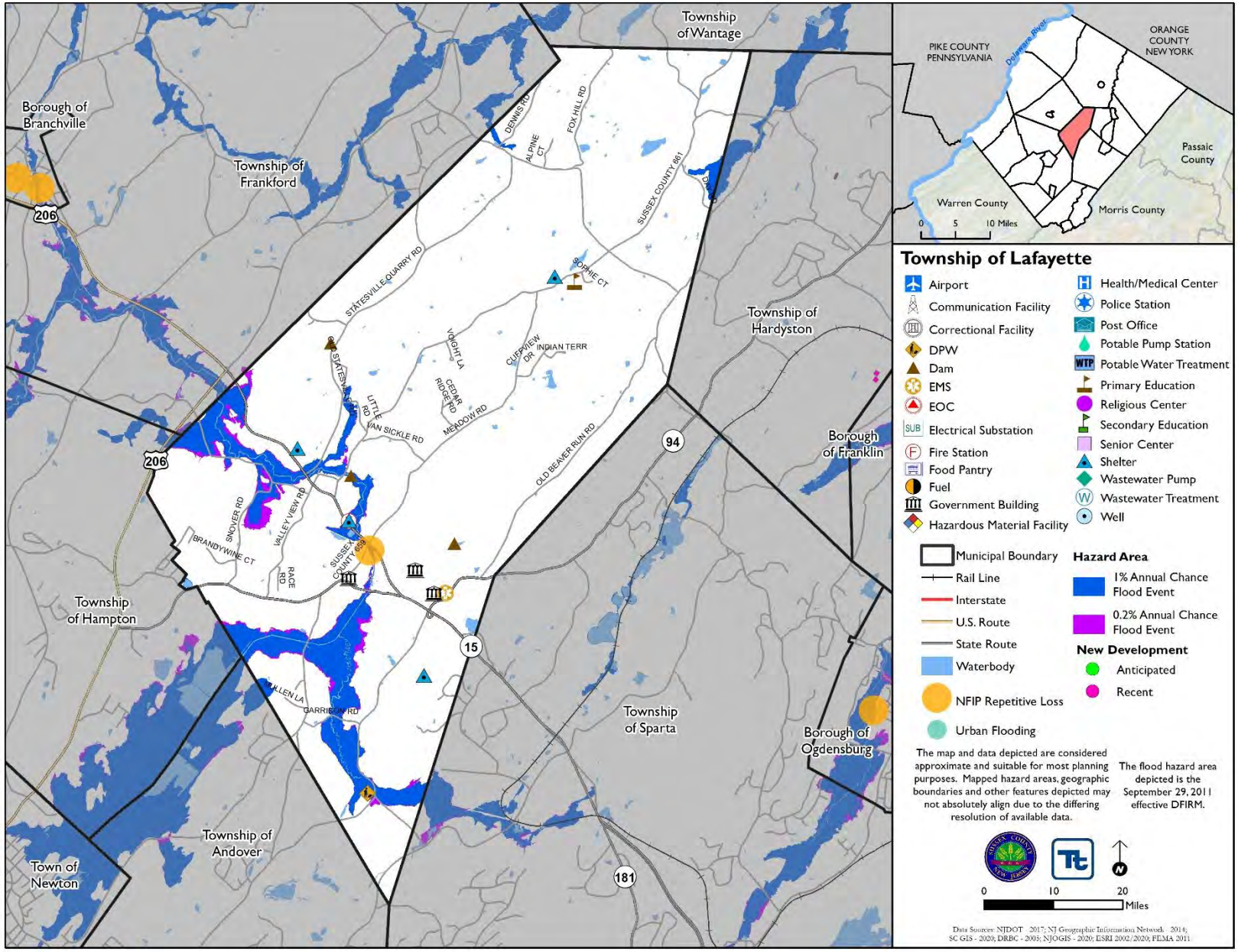


Figure 9.14-2. Township of Lafayette Hazard Area Extent and Location Map 2

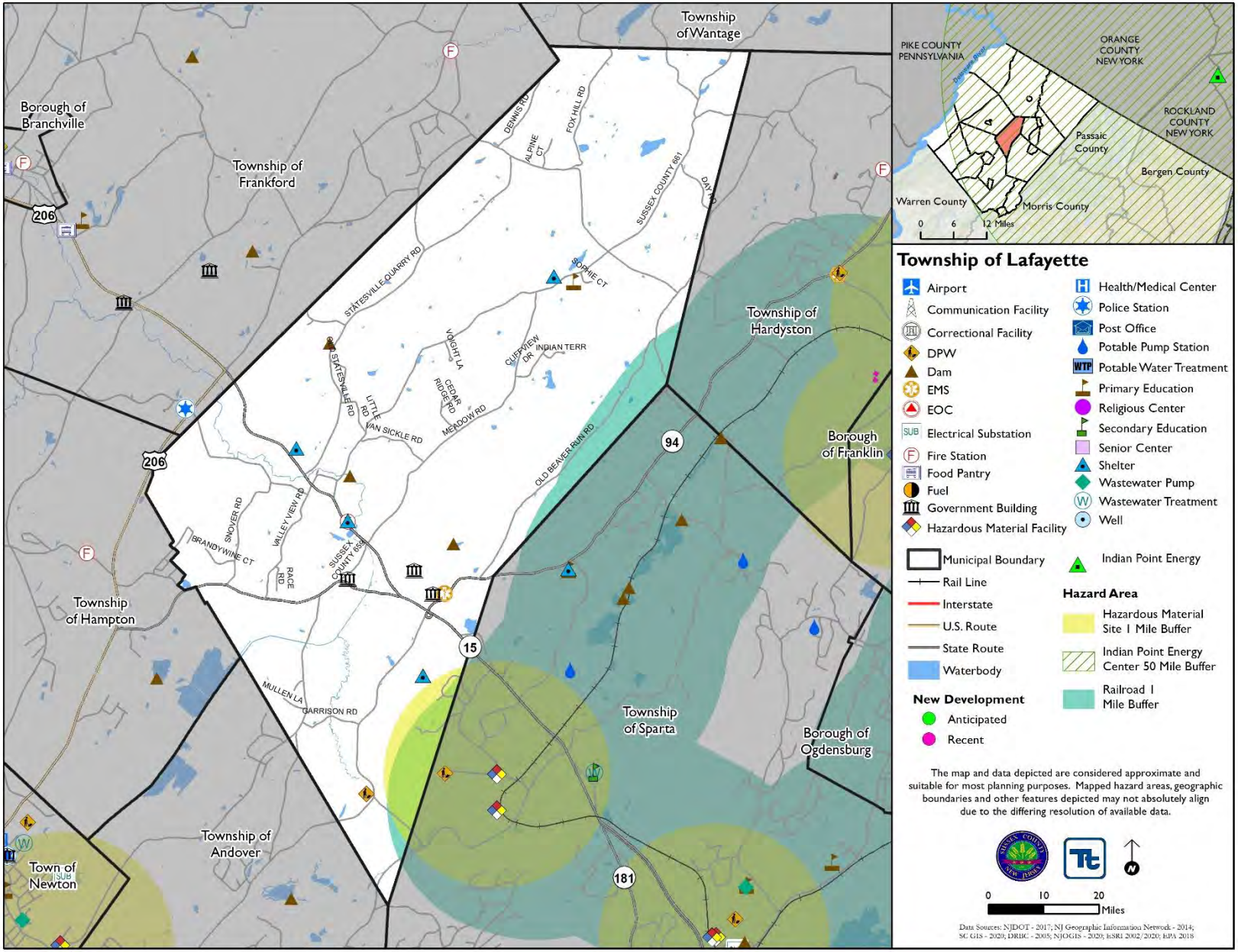
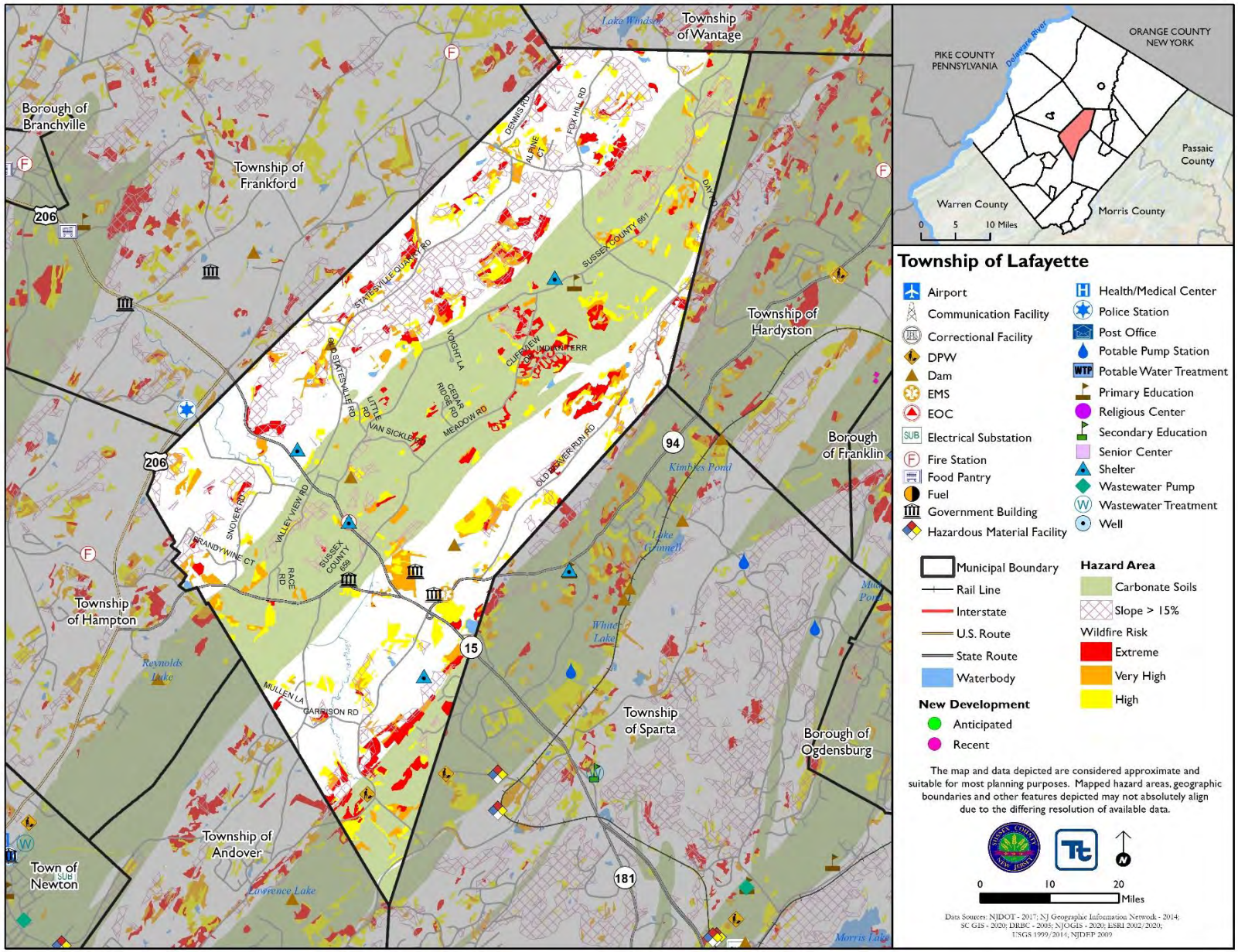


Figure 9.14-3 Township of Lafayette Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Municipal Building Backup Generator		
Project Number:	2020-Lafayette-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. Municipal Building does not have a generator and this area has been without power for over seven days in the past. The Township has researched and have proposals for 65kW generator with sized auto transfer switch. Natural gas was extended to the municipal building in October 2019 but the size of loads and location requires larger generator and more complicated installation resulting in higher costs		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will purchase and install a 65kW natural gas generator with transfer switch.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	65kW	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of Municipal Building
Useful Life:	20 years	**Goals Met:**	1, 3
Estimated Cost:	$35,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 1 year
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Engineer, Public Works	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Municipal Building Backup Generator	
Project Number:	2020-Lafayette-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Municipal Building
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Storm, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	1	Within 1 year
Agency Champion	1	Engineer, Public Works
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Fire Department Backup Generator		
Project Number:	2020-Lafayette-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. The Fire Department does not have a reliable and adequately sized emergency power generator. This section of town has been without power for more than 7 days. The Township has researched and have proposals for a 40kW generator with 400amp auto transfer switch, initial propane fueled with new tanks installed until natural gas is extended to Fire House building.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will purchase and install a 40kW generator with 400amp auto transfer switch, initial propane fueled with new tanks installed until natural gas is extended to Fire House building. When natural gas is extended to the Fire House building, the Township will modify the generator to allow for natural gas use.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	40kW	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of Fire Department
Useful Life:	20 years	**Goals Met:**	
Estimated Cost:	$26,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 1 year
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Engineer, Public Works, Fire Department	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Fire Department Backup Generator	
Project Number:	2020-Lafayette-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Fire Department
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Storm, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	1	Within 1 year
Agency Champion	1	Engineer, Public Works, Fire Department
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Paulinskill Brook Flood Study		
Project Number:	2020-Lafayette-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Paulinskill Brook causes flooding when water backs up at the Rt 15 bridge and backflows into the park and recreation area. This has led to repetitive losses. This also results in blocking the major state highway and shutting down travel for days, resulting in traffic diversion onto local roads. This shuts down access to businesses located in the center of town.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will conduct a flood study of the area. It is assumed that the slope and drainage in this area needs significant improvements but this is significantly impacted by the blockage at the Rt 15 bridge which results in backflow of rising water into the park. Once the flood study is complete and has identified cost effective improvements, the Township will carry out the identified mitigation measures.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD by flood study	**Estimated Benefits (losses avoided):**	Reduction in flooding, addressing repetitive losses
Useful Life:	TBD by flood study	**Goals Met:**	
Estimated Cost:	TBD by flood study	**Mitigation Action Type:**	Structure and Infrastructure Projects, Natural Systems Protection
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	5 years	**Potential Funding Sources:**	HMGP, BRIC, Township budget
Responsible Organization:	Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation planning, stormwater planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Deepen Paulinskill Brook	$500,000	Costly and unlikely to solve problem
	Remove Rt. 15 bridge	N/A	Not possible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Paulinskill Brook Flood Study	
Project Number:	2020-Lafayette-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	.
Property Protection	1	Reduction in flooding risk
Cost-Effectiveness	1	
Technical	1	Technically feasible project
Political	1	
Legal	0	The project may require permitting.
Fiscal	0	Project will require funding assistance.
Environmental	1	Project will restore Paulinkskill Brook
Social	1	Reduction in flooding, addressing repetitive losses
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	Engineer
Other Community Objectives	1	Address repetitive loss
Total	9	
Priority (High/Med/Low)	High	

9.15 TOWNSHIP OF MONTAGUE

This section presents the jurisdictional annex for the Township of Montague. The annex includes a general overview of the Township of Montague; an assessment of the Township of Montague's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.15.1 Hazard Mitigation Planning Team

The Township of Montague followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.15-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: David Coss, OEM Coordinator Address: 277 Clove Road, Montague, NJ 07827 Phone Number: (908) 319-1811 Email: coss1101@yahoo.com	Name / Title: Eileen DeFabiis, Clerk Address: 277 Clove Road, Montague, NJ 07827 Phone Number: (973) 293-7300 Email: clerk@montaguenj.org

NFIP Floodplain Administrator
Name / Title: Robert Huber, Construction Official/Plumbing Sub-Code Official Address: 277 Clove Road Montague NJ 07827 Phone Number: (973) 293-3366 Email: construction@montaguenj.org

Name	Title	Method of Participation
David Coss	OEM Coordinator	Primary point of contact
Eileen DeFabiis	Clerk	Alternate point of contact; attended the annex trainings
Robert Huber	Construction Official/Plumbing Sub-Code Official	NFIP floodplain administrator; attended the kickoff meeting
Jesse Brace-Revak	Deputy Emergency Management Coordinator	Attended the annex training, risk assessment meeting and mitigation strategy workshop; provided data and information for the annex update

9.15.2 Jurisdiction Profile

Montague Township is located in the northwest corner of Sussex County. It is bordered to the north by New York State, to the south by Frankford and Sandyston Townships, to the east by Wantage Township and to the west by Pennsylvania. The Township covers a total area of 43.9 square miles. The following unincorporated communities are located within the Township: Four Corners, Montague, Millville, and Duttonville. The Delaware River makes up the northern and western border between the Township and Pennsylvania. Big Flat

Brook is a stream located in the southern end of the Township. There are many ponds and lakes located throughout the Township as well.

According to the U.S. Census, the 2010 population for the Township of Montague was 3,847. The estimated 2018 population was 3,716, a 3.4 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 3.7 percent of the population is 5 years of age or younger and 17.3 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.15.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.14-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.15-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units										
Multi-Family										
Other (commercial, mixed-use, etc.)										

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
Emergency Services Radio Repeater Site	Commercial	1	79 Deckertown Turnpike	Nuclear Incident Hazard Area	Recent

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.15.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Montague performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs

- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Montague identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Montague and where hazard mitigation has been integrated.

Table 9.15-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *This code follows State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Land Use Department is responsible for this code in compliance with Chapter 76.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Land Use Department is responsible for this ordinance in compliance with Chapter 60.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The Township Committee is responsible for this ordinance in compliance with Chapter 56.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	Yes – if municipality has a Planning Board	-	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Land Use Department is responsible for these requirements in compliance with Chapter 60.*					
Environmental Protection	No	-	No	-	-
Comment:					
Flood Damage Prevention	Yes	State & Local	Yes	Yes	2021-Montague-005
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *Chapter 38 Flood Damage Prevention is administered by the NFIP Floodplain Administrator, designated as the Township Engineer.* • *It is the purpose of this chapter to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:* o *A. Protect human life and health;* o *B. Minimize expenditure of public money for costly flood control projects;* o *C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* o *D. Minimize prolonged business interruptions;* o *E. Minimize damage to public facilities and utilities, such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;* o *F. Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;* o *G. Ensure that potential buyers are notified that property is in an area of special flood hazard; and*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
o *H. Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.* • *The ordinance does not include discussion of freeboard.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	Yes	Local and County	No	No	No
Comment: • *Chapter 37 Fire Prevention*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other:	No	-	No	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes/No	Yes/No
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Land Use Department is responsible for this plan. The plan was adopted after re-examination on December 8, 2011.*					
Capital Improvement Plan	Yes	Local	No	Yes/No	Yes/No
Comment: *The Township Committee is responsible for this plan. Adopted Budget 4/14/2015.*					
Disaster Debris Management Plan	No	-	No	-	2021-Montague-004
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	No	State & Local	Yes	Yes/No	Yes/No
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.					
Stormwater Pollution Prevention Plan	Yes/No	If yes, who enforces?	Yes	Yes/No	Yes/No
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other	No	-	No	-	-
Comment:					
Response/Recovery Planning					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	County & Local	Yes	No	No
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Township OEM is responsible for this plan in compliance with the Emergency Operations Plan.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	Yes	County and Local	No	No	No
Comment:					
Other	No	-	No	-	-
Comment:					

Table 9.15-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes/No
Does your jurisdiction have the ability to track permits by hazard area?	Yes/No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes/No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Montague.

Table 9.15-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Land Use Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	No	-
Open Space Board / Committee	No	-
Economic Development Commission / Committee	Yes	???
Warning Systems / Services (mass notification system, outdoor warning signals)	Yes	Fire/OEM
Maintenance program to reduce risk	No	-

Staff/Personnel Resource	Available?	Department/Agency/Position
Mutual aid agreements	Yes	Fire/DPW
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Harold E. Pellow & Associates
Engineers or professionals trained in building or infrastructure construction practices	No	-
Planners or engineers with an understanding of natural hazards	No	-
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes/No	???
Staff with education/knowledge/training in low impact development	Yes/No	???
Surveyor	No	-
Stormwater engineer	Yes/No	???
Personnel skilled or trained in GIS applications	No	-
Local or state water quality professional	Yes/No	???
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM
Watershed planner	Yes/No	???
Environmental specialist	Yes/No	???
Grant writers	Yes	???
Resilience Officer	Yes/No	???

Fiscal Capability

The table below summarizes financial resources available to the Township of Montague.

Table 9.15-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	No
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	No
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes/No
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Montague.

Table 9.15-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes
Do you have personnel skilled or trained in website development?	Yes/No
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	No

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Montague.

Table 9.15-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Yes/No	Yes/No	Yes/No
Public Protection (Fire ISO Protection Class)	Yes	6/9	Being Reviewed
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.15-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.15-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Construction
Who is your floodplain administrator? (name, department/position)	Robert Huber, Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	September 13, 2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements.
When was the most recent Community Assistance Visit or Community Assistance Contact?	???
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	No
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	19 policies
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	17 claims $178,248 in payments
Do you maintain a list of properties that have been damaged by flooding?	No

Criterion	Response
Do you maintain a list of property owners interested in flood mitigation?	???

** According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

9.15.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Montague's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.14-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.15-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	???
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	$2,211.84

Source: FEMA 2020, NOAA NCEI 2020

9.15.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Montague risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Montague that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Montague has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Montague.

- Number of repetitive loss (RL) properties: 2
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.15-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
21-56 Clove Lake Dam	Dam	X	X
21-65 Hainesville WMA Dam	Dam	X	X
22-170 Biccum Dam	Dam	X	X
22-198 No Name #62 Dam	Dam	X	X

Source: Sussex County Planning Partnership 2020

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The new fire house/community center/shelter, located at 274 Clover Road, is a lifeline for the Township and provides essential services to the municipality and its residents. It currently does not have a backup generator to provide continuity of operations during a power outage and serve as a shelter to the community.
- The Montague Township Elementary School at 475 Route 206 lacks a backup power source.
- Frequent flooding events have resulted in damages to residential properties. These properties have been repetitively flooded as documented by paid NFIP claims. The Township has 2 repetitive loss properties but other properties may be impacted by flooding as well.
- The Township currently does not have an adopted debris management plan. Without a plan in place, there are no identified resources in place to properly address debris and do not have identified locations for debris storage.
- The Township's current flood damage prevention ordinance was last adopted in 2011. It currently does not have a freeboard requirement and does not meeting New Jersey's minimum requirement.
- It is unknown if the windows of the town hall building located at 277 Clover Road are impact resistant.
- Montague Township is located within the northwest corner of the State and sits along the Delaware River. Several state and national parks are located within the Township, providing acres of forested land. This creates an increased risk of wildfires to residents who border the forested areas.
- Montague Township is located within the northwest corner of the State and sits along the Delaware River. Properties located along the river are susceptible to flooding and damages.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Montague ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Montague. The Township of Montague has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Montague agreed with the calculated hazard rankings.

Table 9.15-13. Township of Montague Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Low	High	High	High	Medium

9.15.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.14-15 and Table 9.14-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.15-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update? Check if Yes	Include in the 2021 HMP Update? Enter 2021 HMP Action #
Montague-1 (old #2)	Retrofit roof to current standards for snow load on Montague Fire Department building located on Clove Road.	Station Commander	Completed – new building		
Montague-2 (old #3)	Retrofit roof to current standards for high winds on Montague Fire Department building located on Clove Road.	Station Commander	Completed – new building		
Montague-3 (old #4)	Retrofit roof to current standards for high winds on Montague Elementary School (shelter) located on Route 206.	School Board Administrator	Completed		
Montague-4 (old #6)	Ensure continuity of operations at critical facilities.	OEM Coordinator	No Progress	X	2021-Montague-002

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
	Identified at this time: Backup generator for Montague Elementary School (shelter) located on Route 206.				
Montague-5 (old #9)	Retrofit municipal building with impact resistant windows and shutters located on Clove Road.	Municipal Engineer	No Progress	X	2021-Montague-006
Montague-6 (old #10)	Work with the New Jersey Forest Fire Service to implement the FireWise program for the Township	OEM Coordinator	No Progress	X	2021-Montague-007
Montague-7 (old #11)	The Township will add three warning systems along flood areas on River Road. This will help better warn the Township in the event of flooding.	OEM Coordinator	Ongoing Capability		
Montague-8 (old #12)	Conduct a study along the river banks of the Delaware and Benekill Rivers to identify areas that need to be elevated to reduce flooding impacts.	Township Engineer	No Progress	X	2021-Montague-008
Montague-9 (old #13)	Conduct all-hazards public education and outreach program for hazard mitigation and preparedness.	OEM Coordinator, in coordination with SCDEM	Ongoing Capability		
Montague-10 (new)	Review the current hazard mitigation plan prior to updating land use, zoning changes, or development permitting.	Township	Ongoing Capability		
Montague-11 (new)	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Engineering via NFIP FPA with NJOEM, FEMA support	No Progress	X	2021-Montague-003

In addition to the above progress, the Township of Montague identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- The Township is in the process of building a new fire house, Community center with an emergency shelter

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Montague participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Montague participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.14-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Montague would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.14-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.15-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Montague-001	Backup Generator for Fire House/ Community Center / Shelter	**Problem**: The new fire house/community center/shelter, located at 274 Clover Road, is a lifeline for the Township and provides essential services to the municipality and its residents. It currently does not have a backup generator to provide continuity of operations during a power outage and serve as a shelter to the community. **Solution:** Working with the Township Engineer, determine the proper type and size of generator for the facility. Once determined, obtain funding and purchase generator. Once purchased, install generator.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter	1, 2, 6	Engineer, Township OEM, Administration	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Continuity of operations; shelter for residents during an emergency	$100,000+	Within 2 years	High	SIP	ES
2021-Montague-002	Backup Generator for Elementary School	**Problem**: The Montague Township Elementary School at 475 Route 206 lacks a backup power source. **Solution:** The Engineer will research what size generator is needed to power the Montague Township Elementary School. The Township will then purchase and install the selected generator and necessary electrical components to supply backup power to the Montague Township Elementary School.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter	1, 2, 6	Engineer, Township OEM, Administration, School Board	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Ensures continuity of operations of Montague Township Elementary School	$75,000	Within 5 years	High	SIP	ES
2021-Montague-003	Repetitive Loss Properties	**Problem**: Frequent flooding events have resulted in damages to residential properties. These properties have been repetitively flooded as documented by paid NFIP claims. The Township has 2 repetitive loss properties but other	Existing	Flood, Severe Weather	1, 2, 3	FPA, Homeowners	FEMA HMGP and FMA, local cost share by residents	Eliminates flood damage to homes and residents, creates open space	$500,000	3 years	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		properties may be impacted by flooding as well. **Solution:** Conduct outreach to 10 flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone areas that experience frequent flooding (high risk areas).						for the municipality increasing flood storage.				
2021-Montague-004	Develop Debris Management Plan	**Problem**: The Township currently does not have an adopted debris management plan. Without a plan in place, there are no identified resources in place to properly address debris and do not have identified locations for debris storage. **Solution:** The Township will develop a debris management plan that will assist the municipality when they need to facilitate response and recovery after a debris-causing incident. The plan will provide direction to facilitate and coordinate the management of debris following a disaster.	Existing	All hazards	3, 5, 6	OEM, Public Works	Township budget	Increased disaster capability and preparedness	Staff time	1 year	High	LPR	ES
2021-Montague-005	Update Flood Damage Prevention Ordinance	**Problem**: The Township's current flood damage prevention ordinance was last adopted in 2011. It currently does not have a freeboard requirement and does not meeting New Jersey's minimum requirement. **Solution:** The Township will update its flood damage prevention ordinance to meet the New Jersey	New and Existing	Flood	1, 2	Township Administration, Engineer	Township budget, FEMA BRIC	Meet state standards, reduce future flood risk	Staff time	6 months	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		requirement of one foot of freeboard.											
2021-Montague-006	Impact Resistant Windows and Shutters for Town Hall	**Problem**: It is unknown if the windows of the town hall building located at 277 Clover Road are impact resistant. **Solution:** The Township will conduct a study to determine whether or not the windows of town hall are impact resistant. If not, the Township will retrofit municipal building with impact resistant windows and shutters.	Existing	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather	2, 6	OEM, Public Works	HMGP, BRIC, USDA Community Facilities Grant Program, Township budget	Reduction in risk of roof failure and protection of critical services	High	3 years	High	SIP	PP
2021-Montague-007	Firewise	**Problem**: Montague Township is located within the northwest corner of the State and sits along the Delaware River. Several state and national parks are located within the Township, providing acres of forested land. This creates an increased risk of wildfires to residents who border the forested areas. **Solution:** The Township will follow the proper steps in applying for and becoming a Firewise community. This includes forming a board/committee, obtaining a wildfire risk assessment, developing an action plan, and hosting outreach events and programs. The Township will also create an education program and set up town hall meetings.	New and Existing	Wildfire	1, 2, 3	Township Administration, Fire Department	Township budget	Increase wildfire awareness, provide grant opportunities for Township	<$20,000	Within 4 years	Medium	LPR, EAP	PI, ES
2021-Montague-008	Delaware River Study	**Problem**: Montague Township is located within the northwest corner of the State and sits along the Delaware River. Properties located along the river are susceptible to flooding and damages. **Solution:** Conduct a study along the river banks of the Delaware	Existing	Flood	1, 2, 4	Engineer	HMGP, BRIC, municipal budget	Reduction in flood risk in selected areas	TBD by flood study	Within 5 years	High	LPR, SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		River to identify areas that need to be elevated to reduce flooding impacts. Once identified, cost-effective actions will be carried out.											

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC	*Building Resilient Infrastructure and Communities Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.15-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Montague-001	Backup Generator for Fire House/ Community Center / Shelter	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High ⚠
2021-Montague-002	Backup Generator for Elementary School	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Montague-003	Repetitive Loss Properties	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2021-Montague-004	Develop Debris Management Plan	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High
2021-Montague-005	Update Flood Damage Prevention Ordinance	0	1	1	1	1	1	1	1	1	1	0	1	1	1	12	High
2021-Montague-006	Impact Resistant Windows and Shutters for Town Hall	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Montague-007	Firewise	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High
2021-Montague-008	Delaware River Study	0	1	0	1	1	1	0	1	1	0	1	0	1	1	9	High

Notes: *Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.*
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.15-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure					X			
Disease Outbreak					X			
Drought					X			
Earthquake					X			
Flood	X	X			X		X	
Geologic					X			
Hazardous Materials					X			
Hurricane and Tropical Storm		X			X			
Invasive Species					X			
Nor'Easter		X			X			
Severe Weather		X			X			
Severe Winter Weather		X			X			
Wildfire			X		X			X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard

ORANGE medium ranked hazard

YELLOW low ranked hazard

Figure 9.15-1. Township of Montague Hazard Area Extent and Location Map 1

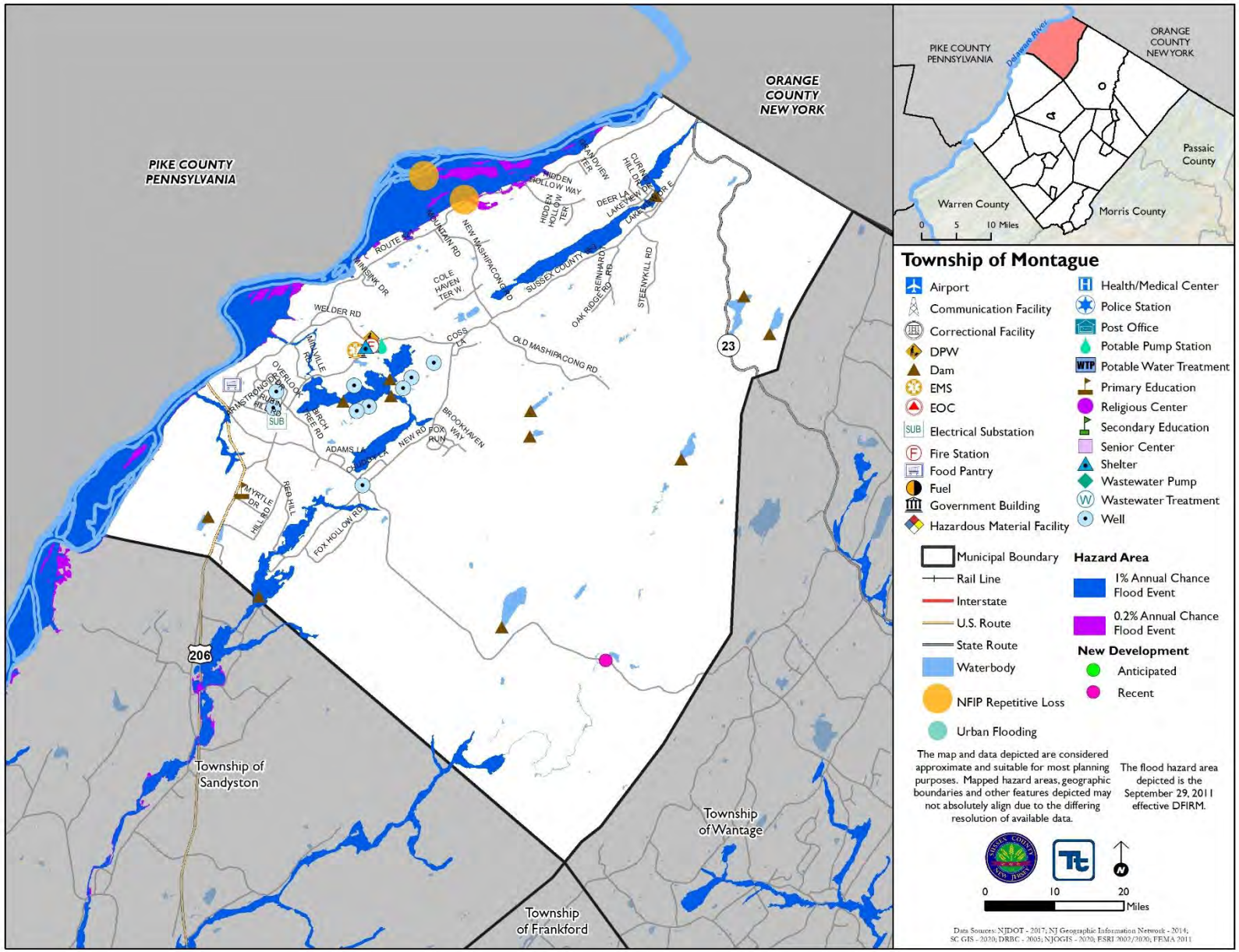


Figure 9.15-2. Township of Montague Hazard Area Extent and Location Map 2

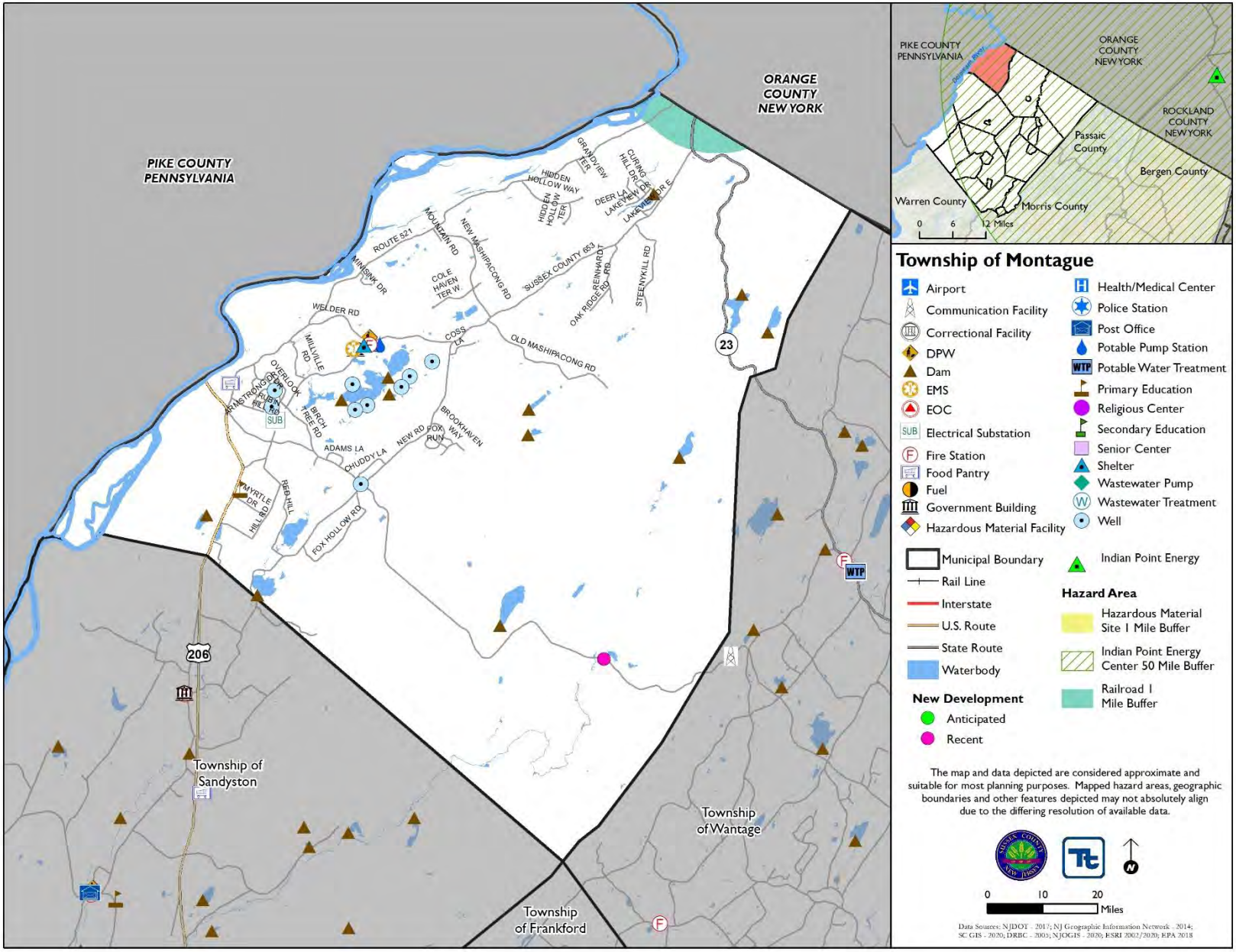
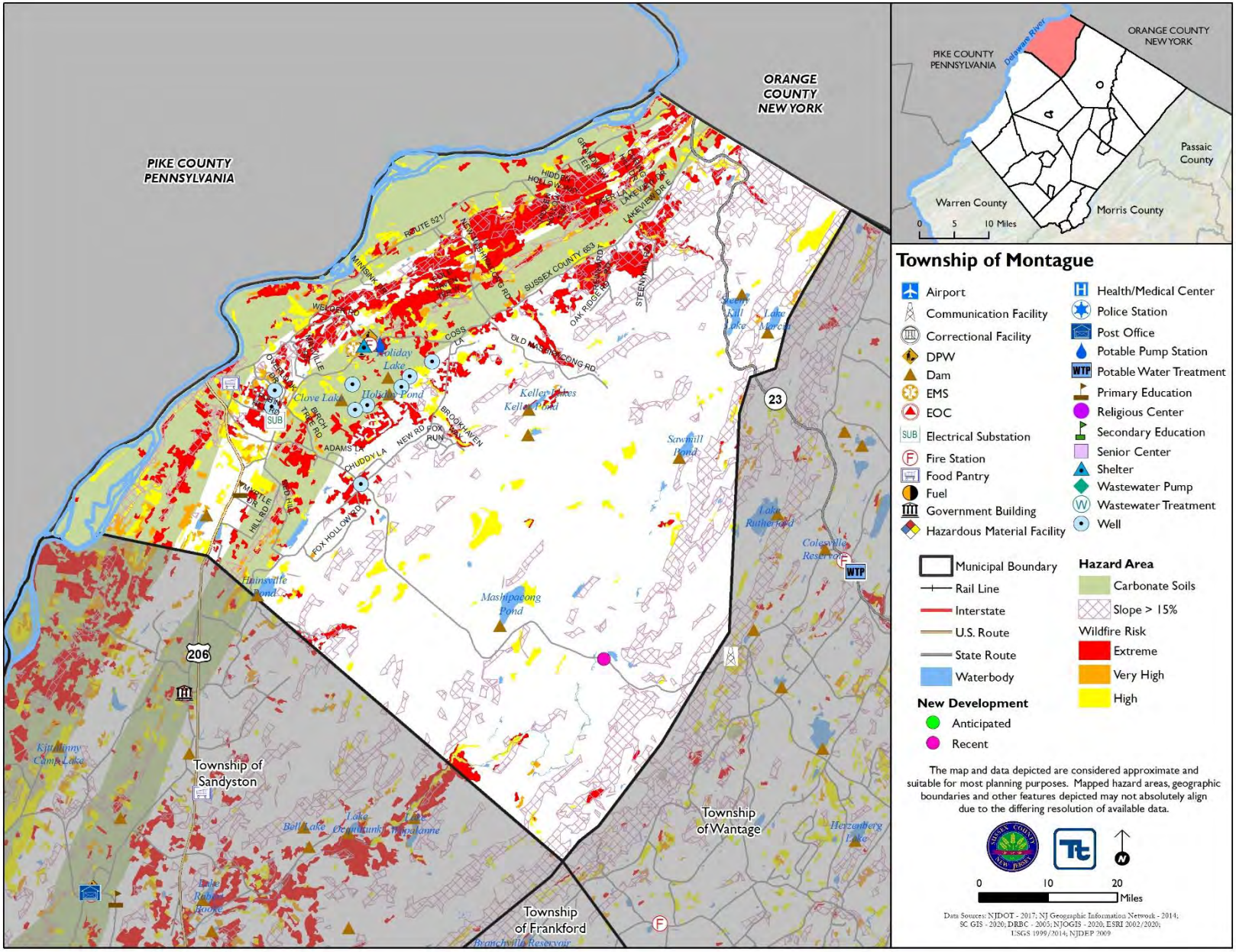


Figure 9.14-3 Township of Montague Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Backup Generator for Fire House/ Community Center / Shelter		
Project Number:	2021-Montague-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	The new fire house/community center/shelter, located at 274 Clover Road, is a lifeline for the Township and provides essential services to the municipality and its residents. It currently does not have a backup generator to provide continuity of operations during a power outage and serve as a shelter to the community.		
Action or Project Intended for Implementation			
Description of the Solution:	Working with the Township Engineer, determine the proper type and size of generator for the facility. Once determined, obtain funding and purchase generator. Once purchased, install generator.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Continuity of operations; shelter for residents during an emergency
Useful Life:	20 years	**Goals Met:**	1, 2, 6
Estimated Cost:	$100,000+	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Engineer, Township OEM, Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Backup Generator for Fire House/ Community Center / Shelter	
Project Number:	2021-Montague-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Montague Township Elementary School
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Engineer, Township OEM, Administration
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Backup Generator for Elementary School		
Project Number:	2021-Montague-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. The Montague Township Elementary School at 475 Route 206 lacks a backup power source.		
Action or Project Intended for Implementation			
Description of the Solution:	The Engineer will research what size generator is needed to power the Montague Township Elementary School. The Township will then purchase and install the selected generator and necessary electrical components to supply backup power to the Montague Township Elementary School.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of Montague Township Elementary School
Useful Life:	20 years	**Goals Met:**	1, 3
Estimated Cost:	$75,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Engineer, Township OEM, Administration, School Board	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Backup Generator for Elementary School	
Project Number:	2021-Montague-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Montague Township Elementary School
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Engineer, Township OEM, Administration, School Board
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	2021-Montague-003		
Project Number:	2020-Sheldon-008		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Frequent flooding events have resulted in damages to residential properties. These properties have been repetitively flooded as documented by paid NFIP claims. The Township has 2 repetitive loss properties but other properties may be impacted by flooding as well.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to 10 flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone areas that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Is this project related to a Critical Facility located within the 100-year floodplain?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	1, 2, 3
Estimated Cost:	$500,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Three years	**Potential Funding Sources:**	FEMA HMGP and FMA, local cost share by residents
Responsible Organization:	NFIP Floodplain Administrator, supported by homeowners	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$500,000	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$500,000	Elevated roadways would not protect the homes from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Repetitive Loss Properties	
Project Number:	2021-Montague-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would remove families from the flood prone areas of the Township
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	
Agency Champion	1	NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Impact Resistant Windows and Shutters for Town Hall		
Project Number:	2021-Montague-006		
Risk / Vulnerability			
Hazard(s) of Concern:	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather		
Description of the Problem:	It is unknown if the windows of the town hall building located at 277 Clover Road are impact resistant.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will conduct a study to determine whether or not the windows of town hall are impact resistant. If not, the Township will retrofit municipal building with impact resistant windows and shutters.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	500-year wind event	**Estimated Benefits (losses avoided):**	Reduction in risk of roof failure and protection of critical services
Useful Life:	25 years	**Goals Met:**	2, 6
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	3 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, USDA Community Facilities Grant Program, Township budget
Responsible Organization:	OEM, Public Works	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, Emergency management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Build new Pump Facility	High	Costly, unnecessary
	Build small pump station in case of failure	High	Costly, facility unlikely to be used

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Impact Resistant Windows and Shutters for Town Hall	
Project Number:	2021-Montague-006	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protects critical services of Town Hall
Property Protection	1	Protects Town Hall from wind damages
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Township has the legal authority to complete the project
Fiscal	0	The project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather
Timeline	0	5 years
Agency Champion	1	OEM, Public Works
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Delaware River Study		
Project Number:	2021-Montague-008		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	Montague Township is located within the northwest corner of the State and sits along the Delaware River. Properties located along the river are susceptible to flooding and damages.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct a study along the river banks of the Delaware River to identify areas that need to be elevated to reduce flooding impacts. Once identified, cost-effective actions will be carried out.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD by flood study	**Estimated Benefits (losses avoided):**	Reduction in flood risk in selected areas
Useful Life:	TBD by flood study	**Goals Met:**	1, 2, 4
Estimated Cost:	TBD by flood study	**Mitigation Action Type:**	Local Plans and Regulations, Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	5 years	**Potential Funding Sources:**	HMGP, BRIC, municipal budget
Responsible Organization:	Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation planning, stormwater planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate roadways	$500,000	Costly and may not solve problem
	Buyout homes	High	Costly, negative social impacts

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Delaware River Study	
Project Number:	2021-Montague-008	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Reduction in flooding risk
Cost-Effectiveness	0	
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	1	Project would reduce flooding impacts.
Administrative	0	
Multi-Hazard	1	Flood
Timeline	0	
Agency Champion	1	Engineer
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	High	

9.16 TOWN OF NEWTON

This section presents the jurisdictional annex for the Town of Newton. The annex includes a general overview of the Town of Newton; an assessment of the Town of Newton's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.16.1 Hazard Mitigation Planning Team

The Town of Newton followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.16-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Dan Finkle, Deputy OEM Coordinator Address: 39 Trinity Street, Newton, NJ 07860 Phone Number: (973) 383-3521 x267 Email: dfinkle@newtonoem.org	Name / Title: Ken Teets, OEM Coordinator Address: 39 Trinity Street, Newton, NJ 07860 Phone Number: (973) 383-3521, x362 Email: kteets@newtonoem.org
NFIP Floodplain Administrator	
Name / Title: Cory Stoner, Town Engineer Address: 17 Plains Road, Augusta, NJ 07822 Phone Number: 973-948-6463 Email: cstoner@hpellow.com	

Name	Title	Method of Participation
Dan Finkle	Deputy OEM Coordinator	Primary point of contact, provided data and information, contributed to mitigation strategy; attended the kickoff meeting, annex training and mitigation strategy workshop; posted mitigation plan update on the Town website and on social media (Facebook and Twitter)
Ken Teets	OEM Coordinator	Alternate point of contact
Cory Stoner	Town Engineer	NFIP floodplain administrator
Katherine Citterbart	Zoning Officer, Land Use Secretary, Historic Preservation Advisory Commission Secretary	Provided recent and anticipated development
Jessica Caldwell	Planner	Attended the annex training
Terry Oswin	Deputy Town Manager/Deputy Municipal Clerk	Attended the kickoff meeting and annex training

9.16.2 Jurisdiction Profile

The Town of Newton is located centrally in Sussex County and is the county seat of the County. It is bordered to the north by Hampton Township, to the south and east by Andover Township and to the west by Fredon

Township. The Town covers an area of approximately 3.2 square miles. The Paulins Kill Tributary flows through the Town and the Pequest River is found in the southern end of the Town.

According to the U.S. Census, the 2010 population for the Town of Newton was 7,997. The estimated 2018 population was 7,895, a 1.3 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 4.0 percent of the population is 5 years of age or younger and 17.9 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.16.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.15-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.16-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	0	0	7	0	0	0	12	0	22	0
Multi-Family	0	0	2	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	2	0	0	0	5	0	0	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
AutoZone	Commercial	1	124 Water Street	Nuclear Incident Hazard Area	Complete
RPM Development Group – Newton Town Centre	Residential	65 Units	225 Spring Street	Nuclear Incident Hazard Area, Hazardous Material Incident Area, Carbonate Soil	Complete
Thor Labs – Natural Selections	Commercial	1	Block 18.02 Lots 2, 3, 19-23,31 & 32	Nuclear Incident Hazard Area, Hazardous Material Incident Area, Carbonate Soil	Construction in Progress
Martorana/Grand Villaggio	Residential	54 Townhomes and 6 Low/Moderate Income Apartments	Block 22.05, Lot 13 – 104 Sparta Ave	Nuclear Incident Hazard Area, Hazardous Material Incident	Approved May 15, 2013. Nearing completion

				Area, Carbonate Soil	
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Thorlabs – Quantum Realm	Commercial	2	Block 20.02, Lot 1 and Block 22.04, Lots 3 & 4, 1 Brooks Plaza	Nuclear Incident Hazard Area, Hazardous Material Incident Area, Carbonate Soil	Approved February 17, 2021-Construction of a 153,000 warehousing/distribution facility. No anticipated start date.
121 Water Street	Mixed Use	5 Structures	121 Water Street	Nuclear Incident Hazard Area	Anticipated, no approval to date
Weis Markets #143 - Gas-N-Go	Commercial	1	119-121 Water Street	Nuclear Incident Hazard Area, Carbonate Soil	Construction of a gas station with a kiosk and six fueling stations. Approved July 15, 2020

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.16.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Town of Newton performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Town of Newton identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Town of Newton and where hazard mitigation has been integrated.

Table 9.16-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Construction Department is responsible for this code in compliance with State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Code Enforcement is responsible for this code in compliance with Chapter 320 – Zoning (2011).*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Planning Board is responsible for this ordinance in compliance with Chapter 240 – Land Subdivision and Site Plan Review (2011).*					
Stormwater Management	Yes	State & Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *All application which come before the Planning Board are subject to the Stormwater Management Ordinance - Chapter 258 of the Municipal Code.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *State Mandated on a municipal level. See Zoning Ordinance; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.* • *The Code Enforcement is responsible for these ordinances in compliance with Chapter 320 – Zoning (2011 of the Municipal Code).*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Planning Board is responsible for these requirements in compliance with Chapter 240 – Land Subdivision and Site Plan Review.*					
Environmental Protection	No	-	No	-	-
Comment:					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	-
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Construction Official is responsible for this ordinance in compliance with Chapter 120 – Flood Damage Prevention (2011).*					
Wellhead Protection	Yes	State & Local	No	Yes	-
Comment: • *Underground Storage Tank Regulations (N.J.A.C. 7:14B) establishes regulations and requires permitting for storage tanks in wellhead protections areas through the New Jersey Department of Environmental Protection.* • *The Planning Board and the Board of Health are responsible for compliance per Section 240-10 – Wellhead Protection of the Municipal Code.*					
Emergency Management	No	-	No	-	-
Comment:					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other: Municipal Separate Storm Sewer System (MS4)	Yes	Local	Yes	Yes	-
Comment: • *The Town is responsible for this ordinance in compliance with Chapter 228, Article 7 – Sewer and Water; Municipal Separate Storm Sewer.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Other: Natural Hazard Ordinance	Yes	Local	No	Yes	-
Comment: • *The Code Enforcement is responsible for this ordinance in compliance with Chapter 320 – Zoning (2011) – Steep Slopes.*					
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Yes	Local	No	Yes	-
Comment: • *The Town is responsible for these ordinances in compliance with Chapter 166 – Land Use Procedures, Chapter 262 – Stream Obstruction, Chapter 297 – Tree Bank, and Chapter 299 – Trees.*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen commissioners with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Planning Board is responsible for this plan in compliance with Town of Newton master Plan, August 2008 (2009/2010).*					
Capital Improvement Plan	Yes	Local	No	Yes	-
Comment: *The Town Manager is responsible for this plan. The plan is updated annually and is a part of the municipal budget with 5-year projection.*					
Disaster Debris Management Plan	No	-	No	-	2021-Newton-010
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The DPW and Town Engineer are responsible for this plan.*					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	Yes	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	Yes	Local	No	Yes	-
Comment: *The Planning Board is responsible for this plan in compliance with Town of Newton Master Plan, August 2008.*					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	Yes	Local	No	Yes	-
Comment: • *The Community Forestry Management Plan 2018-2022 establishes the programs and procedure through which public tree resources under the jurisdiction of the Town of Newton will continue to be managed through 2022.*					
Transportation Plan	Yes	Local	No	Yes	-
Comment: • 2012 Adopted Circulation Plan Element					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other: Open Space Plan	Yes	Local	No	No	-
Comment: • *The Planning Board is responsible for this plan in compliance with Town of Newton Master Plan, August 2008.*					
Other: Watershed Management or Protection Plan	Yes	Local	No	Yes	-
Comment: *The Licensed Operator is responsible for this plan, and it is a part of the Forestry Plan.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19. • *The Office of Emergency Management is responsible for this plan, which is incorporated into the EOP. The plan is currently being updated.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	Yes	Local	No	Yes	-
Comment: *The OEM is responsible for this plan, which is incorporated into the EOP. The plan is currently being updated.*					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	No	-	No	-	-
Comment:					
Other Plans	No	-	No	-	-
Comment:					

Table 9.16-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, the Construction Official grants these permits per Section 120-12 of the Municipal Code
Does your jurisdiction have the ability to track permits by hazard area?	No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No, the 2008 Master Plan projects that a total of 1,920 units could be built increasing the population by 4,589.

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Town of Newton.

Table 9.16-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning and Zoning Boards
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Shade Tree Commission
Open Space Board / Committee	Yes	Recreation Committee; Shade Tree Commission
Economic Development Commission / Committee	Yes	Economic Development Commission
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Nixle
Maintenance program to reduce risk	No	The Town plans to implement municipal programs to prevent trees from threatening lives and impacting power availability/interruption (2021-Newton-014).

Staff/Personnel Resource	Available?	Department/Agency/Position
Mutual aid agreements	Yes	Agreements are in place with neighboring communities but require strengthening (2021-Newton-012).
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Professional Engineer - consultant
Engineers or professionals trained in building or infrastructure construction practices	Yes	Professional Engineer - consultant
Planners or engineers with an understanding of natural hazards	Yes	Professional Engineer and Planners- consultant
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes	Professional Engineer and Planners- consultant
Staff with education/knowledge/training in low impact development	No	-
Surveyor	Yes	Professional Engineer - consultant
Stormwater engineer	Yes	Professional Engineer - consultant
Personnel skilled or trained in GIS applications	Yes	Professional Engineer - consultant
Local or state water quality professional	Yes	Professional Engineer - consultant
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Kenneth Teets, OEM Coordinator
Watershed planner	No	-
Environmental specialist	No	-
Grant writers	Yes	Deputy Town Manager
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Construction Official
Other: Professionals trained in conducting damage assessments	Yes	Building/Construction Department

Fiscal Capability

The table below summarizes financial resources available to the Town of Newton.

Table 9.16-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes – housing rehab program that is a revolving fund
Capital Improvements Project Funding	Yes – part of annual budget
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes – USDA rural development
Development Impact Fees for Homebuyers or Developers	No – pilots for some of the redevelopment plans
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Town of Newton.

Table 9.16-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes, Chief of Police and Administrator
Do you have personnel skilled or trained in website development?	Yes, Contractor builds and updated the website
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	Yes, Social media is used for emergency management including Fire department, police department, First Aid Squad and Department of Public Works.
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes, municipal website, mailings, social media, Nixle, staff on foot (police and fire).

Community Classifications

The table below summarizes the classifications for community programs available to the Town of Newton.

Table 9.16-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	No	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	None	4/13/2009

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.16-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

The Town does not have access to resources to determine the possible impacts of climate change upon the municipality. Although climate change is not currently being integrated into current policies/actions, the administration realizes that addressing climate change is important to the environment, public health, and the economy and would be supportive of future integration efforts.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.16-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Construction
Who is your floodplain administrator? (name, department/position)	Joseph Butto, Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	Adopted by the Town Council on August 22, 2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	Meets
When was the most recent Community Assistance Visit or Community Assistance Contact?	July 31, 2006
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA would consider attending continuing education and/or certification training on floodplain management.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No

Criterion	Response
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	24 polices $8,360,600 insurance in force $62,264 premium in force
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	8 claims $295,505 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
Source: FEMA 2020

Additional Areas of Existing Integration

- **Walkill River Group:** The Walkill River Group conducts plantings in the floodplain.

Opportunities for Future Integration

- **Disaster Debris Management Plan:** The Town plans to develop and implement a Disaster Debris Management Plan (2021-Newton-010).
- **Hazard Archival Process:** The Town will develop programs/ procedures to capture and archive loss data from events including the location and length of roadway closures; high water marks, amount of municipal and residential damage (2021-Newton-011).
- **Mutual Aid Agreements:** The Town will create, enhance, and maintain Mutual Aid agreements with neighboring communities for continuity of operations (2021-Newton-012).
- **Damage Assessment Procedures:** The Town will identify and develop agreements with entities that can provide support with FEMA/NJOEM paperwork after disasters; qualified damage assessment personnel – Improve post-disaster capabilities – damage assessment; FEMA/NJOEM paperwork compilation, submissions, record-keeping (2021-Newton-013).
- **Vegetation Management:** The Town will implement, review, and enforce municipal policies and programs to prevent trees from threatening lives and impacting power availability/interruption (2021-Newton-014).

9.16.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Town of Newton's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.15-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.16-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter	Yes	A major nor'easter, produced record snowfall and blizzard	Although the County was impacted, the Town did not report damages.

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
	Weather and Snowstorm		conditions in parts of New Jersey on January 23rd and 24th.	
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	The Town was subject to closures of businesses and schools and mask and social distancing requirements.

Source: FEMA 2020, NOAA NCEI 2020

9.16.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Town of Newton risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Town of Newton that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Town of Newton has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Town of Newton.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.16-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
22-104 Don Bosco Dam	Dam	X	X

Source: Sussex County Planning Partnership 2020
*Note: *Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The Merriam Avenue School stormwater pump facility is undersized. This results in increased risk of flooding in the surrounding area that is serviced by the pump facility.
- The stormwater management system requires upgrade at the DPW Garage located on Moran Street. The Garage also requires improved access.
- The Emergency Operations Plan lacks a dam failure component.
- The roof of the Newton Municipal Building located on Trinity Street is not designed to withstand high wind.
- Fire House #2's roof is not designed with modern snow load standards. Failure of the roof could threaten the critical services of the Fire House.
- Two buildings at the Sussex County Community College are not designed with windows to withstand wind damages.
- Two buildings at the Sussex County Community College are not designed with modern snow load standards.
- Increased outreach is needed in the Town to increase public awareness.
- The Newton First Aid Squad EMS Station and three pumping stations require automatic standby generators.
- The Town seeks to strengthen sheltering capabilities.
- The Town wants to add additional support for the "Tree Watch" program to proactively manage problem areas through selective removal of hazardous trees and tree replacement.
- The Newton First Aid Squad EMS Station and three pumping stations require automatic standby generators.
- The Town lacks a Disaster Debris Management Plan.
- The Town lacks procedures to capture loss and damage data from hazard events. This limits the knowledge of hazard events and lessens the ability to apply for grant funding support.
- Large scale disaster events require the assistance of outside municipal departments.
- The Town lacks procedures to complete post disaster damage assessments.
- Falling trees cause damage property, reduce continuity of operations, and can cause injuries or death.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Town of Newton ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Town of Newton. The Town of Newton has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Town of Newton agreed with the calculated hazard rankings.

Table 9.16-13. Town of Newton Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.16.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.15-15 and Table 9.15-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.16-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update? Check if Yes	Include in the 2021 HMP Update? Enter 2021 HMP Action #
Newton-1 (new)	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Engineering via NFIP FPA with NJOEM, FEMA support	Complete, the Town has no remaining RL/SRL properties		
Newton-2 (new)	Utilize the Hazard Mitigation Plan (HMP) when updating the Comprehensive Master Plan; consider including hazard identification, hazard zones risk assessment information, and hazard mitigation goals as identified in the HMP. Further, the findings and	Planning	Ongoing Capability		

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update? Check if Yes	Include in the 2021 HMP Update? Enter 2021 HMP Action #
	recommendation of the HMP will be considered during any future site plan review processes.				
Newton-3 (new)	Fire House #2 is in need of updating/renovating. This will include the incorporation of the Town EOC.	Town Administration, Fire Department, OEM	Complete		
Newton-4 (revised old #9)	Dam Site #2 - the Town is in the process of working with the NJDEP to raise the area to the 100-year flood level	Town DPW and Engineering, NJDEP	Complete		
Newton-5 (new)	Work with the County and NJDOT to identify and address the drainage issues along Woodside Avenue.	Town DPW, County, and NJDOT	No Progress		
Newton-6 (new)	Ensure continuity of operations at critical locations: Backup generators for the municipal schools – used for shelters for the Town	School Board, Town Administration	In Progress	X	2021-Newton-009
Newton-7 (new)	Ensure continuity of operations at critical locations: Backup power for the nursing homes and dialysis center located in the Town	Building Operators with support from the Town	In Progress	X	2021-Newton-009
Newton-8 (old #11)	Upgrade capacity of Merriam Avenue School stormwater pump facility.	Town DPW and Engineer	No Progress		
Newton-9 (old #12)	Retrofit roof to meet current standards for high winds on Newton Municipal Building located on Trinity Street.	Town Administration	No Progress	X	2021-Newton-004
Newton-10 (old #14)	Retrofit roof to meet current standards for snow load of Fire House #2 located on Woodside Avenue.	Town Engineer and Fire Department	No Progress	X	2021-Newton-005
Newton-11 (old #15)	Stormwater management system upgrade and improvement access way to DPW Garage located on Moran Street.	Town DPW and Engineer	No Progress	X	2021-Newton-002
Newton-12 (old #17)	Retrofit two buildings with impact resistant windows and shutters at the Sussex County Community College	Engineering and School Administration	No Progress	X	2021-Newton-006
Newton-13 (old #18)	Retrofit two buildings to meet current snow load standards at the Sussex County Community College	Engineering and School Administration	No Progress	X	2021-Newton-007

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Newton-14 (old #19)	Conduct all-hazards public education and outreach program for hazard mitigation and preparedness.	Town Administration, OEM	No Progress	X	2021-Newton-008

In addition to the above progress, the Town of Newton identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- Improvements and dam hardenings were recently completed.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Newton participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Town of Newton participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.15-15 summarizes the comprehensive-range of specific mitigation initiatives the Town of Newton would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.15-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.16-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Newton-001	Merriam Avenue School Pump Facility	**Problem**: The Merriam Avenue School stormwater pump facility is undersized. This results in increased risk of flooding in the surrounding area that is serviced by the pump facility. **Solution:** The Town will upgrade the capacity of Merriam Avenue School stormwater pump facility. The Engineer will design the improvements and the DPW will carry out the upgrades.	Existing	Flood, Severe Weather	2	Town DPW and Engineer	HMGP, BRIC, Municipal budget	Storm water system improved	High	5 years	High	SIP	SP
2021-Newton-002	DPW Garage Stormwater and Access Upgrades	**Problem**: The stormwater management system requires upgrade at the DPW Garage located on Moran Street. The Garage also requires improved access. **Solution:** The Engineer will design upgrades to the stormwater management system and access way improvements. The DPW will carry out the work.	Existing	Flood, Severe Weather	2, 3, 6	Town DPW and Engineer	HMGP, BRIC, Town budget	Access to DPW maintained	High	Within 5 years	High	SIP	SP
2021-Newton-003	Dam Failure Emergency Planning	**Problem**: The Emergency Operations Plan lacks a dam failure component. **Solution:** The Town will complete dam failure inundation mapping and include in updates to the Emergency Operations Plan for Town dams.	New and Existing	Dam Failure	3, 7	OEM	Town budget	Increased emergency planning and preparedness	Low		High	LPR	ES
2021-Newton-004	Municipal Building Wind Designs	**Problem**: The roof of the Newton Municipal Building located on Trinity Street is not designed to withstand high wind. **Solution:** The Engineer will design a new roof to meet current standards for high winds on Newton Municipal Building located on Trinity Street. The Town will then replace the roof.	Existing	Severe Weather, Hurricane, Nor'Easter	2, 6	Town Engineer and Administration	FEMA HMGP, BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program,	Municipal building protected from high winds	Medium	Within 5 years	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
							Town Budget						
2021-Newton-005	Snow Load Improvements at Fire House #2	**Problem**: Fire House #2's roof is not designed with modern snow load standards. Failure of the roof could threaten the critical services of the Fire House. **Solution:** The Engineer will design a new roof to meet current standards for snow load of Fire House #2 located on Woodside Avenue. The Fire Department will then replace the roof.	Existing	Severe Winter Weather, Nor'Easter	1, 2, 6	Town Engineer and Fire Department	FEMA HMGP, BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Town Budget	Fire House designed to withstand snow load	High	Within 5 years	High	SIP	PP
2021-Newton-006	Wind Resistance Improvements at Community College	**Problem**: Two buildings at the Sussex County Community College are not designed with windows to withstand wind damages. **Solution:** The Town Engineer will provide guidance on the retrofit two buildings with impact resistant windows and shutters at the Sussex County Community College.	Existing	Severe Weather, Hurricane, Nor'Easter	2	Engineering and School Administration	Town budget	College official aware of proper design standards	Low	2 years	High	EAP	PI
2021-Newton-007	Snow Load Improvements at Community College	**Problem**: Two buildings at the Sussex County Community College are not designed with modern snow load standards. **Solution:** The Town Engineer will provide guidance on the retrofit of two buildings to meet current snow load standards at the Sussex County Community College.	Existing	Severe Winter Weather, Nor'Easter	2	Engineering and School Administration	Town budget	College official aware of proper design standards	Low	2 years	High	EAP	PI
2021-Newton-008	Hazard Outreach	**Problem**: Increased outreach is needed in the Town to increase public awareness. **Solution:** The Town will design and conduct all-hazards public education and	N/A	All Hazards	3	Town Administration, OEM	Town budget	Increased public awareness	Low	1 year	High	EAP	PI

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		outreach program for hazard mitigation and preparedness.											
2021-Newton-009	Automatic Standby Generators at Critical Facilities	**Problem:** The Newton First Aid Squad EMS Station and three pumping stations require automatic standby generators. **Solution:** The Engineer will research what size generators are needed to power each facility. The Town will then purchase and install the selected generators and necessary electrical components to supply backup power to the facilities.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter	1, 2, 6	Engineer, OEM	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Ensures continuity of operations of critical facilities	$50,000 per generator	Within 5 years	High	SIP	ES
2021-Newton-010	Disaster Debris Management Plan	**Problem:** The Town lacks a Disaster Debris Management Plan. **Solution:** The Town will develop and implement a Disaster Debris Management Plan.	Existing	All Hazards	3	DPW, OEM	Town budget	Plan established for disaster debris	Low	1 year	High	LPR	ES
2021-Newton-011	Hazard Event Archival Process	**Problem:** The Town lacks procedures to capture loss and damage data from hazard events. This limits the knowledge of hazard events and lessens the ability to apply for grant funding support. **Solution:** The Town will develop programs/ procedures to capture and archive loss data from events including the location and length of roadway closures; high water marks, amount of municipal and residential damage.	New & Existing	All Hazards	3, 4, 5	OEM, DPW, Administration	Town budget	Increased record keeping for hazard knowledge and data for grant applications.	Staff time	Within 6 months	High	LPR	ES
2021-Newton-012	Mutual Aid Agreements	**Problem:** Large scale disaster events require the assistance of outside municipal departments.	New& Existing	All Hazards	3, 5, 6	OEM, Administration	Town budget	Increased resourc	Staff time	1 year	High	LPR	ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		Solution: The Town will create, enhance, and maintain Mutual Aid agreements with neighboring communities for continuity of operations.						es and ability to respond to disaster events.					
2021-Newton-013	Damage Assessment Procedures	**Problem:** The Town lacks procedures to complete post disaster damage assessments. **Solution:** The Town will identify and develop agreements with entities that can provide support with FEMA/NJOEM paperwork after disasters; qualified damage assessment personnel – Improve post-disaster capabilities – damage assessment; FEMA/NJOEM paperwork compilation, submissions, record-keeping.	New & Existing	All Hazards	3, 4, 5	Administration, DPW, OEM	Town budget	Damage assessment procedures developed.	Staff time	Within 6 months	High	LPR	ES
2021-Newton-014	Vegetation Management	**Problem:** Falling trees cause damage property, reduce continuity of operations, and can cause injuries or death. **Solution:** The Town will implement, review, and enforce municipal policies and programs to prevent trees from threatening lives and impacting power availability/interruption.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter, Invasive Species	1, 2	Administration, DPW	Town budget	Reduced impacts from falling trees.	Staff time	Within 6 months	High	LPR, NSP	NR

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC	*Building Resilient Infrastructure and Communities Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.16-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Newton-001	Merriam Avenue School Pump Facility	0	1	1	1	1	1	0	1	1	1	1	0	1	0	10	High ⚠
2021-Newton-002	DPW Garage Stormwater and Access Upgrades	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Newton-003	Dam Failure Emergency Planning	1	1	1	1	1	1	1	1	1	1	0	0	1	1	12	High
2021-Newton-004	Municipal Building Wind Designs	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Newton-005	Snow Load Improvements at Fire House #2	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Newton-006	Wind Resistance Improvements at Community College	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High
2021-Newton-007	Snow Load Improvements at Community College	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High
2021-Newton-008	Hazard Outreach	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-Newton-009	Automatic Standby Generators at Critical Facilities	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Newton-010	Disaster Debris Management Plan	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High
2021-Newton-011	Hazard Event Archival Process	0	0	1	1	1	1	1	1	1	1	1	1	1	1	12	High
2021-Newton-012	Mutual Aid Agreements	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2021-Newton-013	Damage Assessment Procedures	0	0	1	1	1	1	1	1	1	1	1	1	1	1	12	High

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Newton-014	Vegetation Management	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.16-17. Analysis of Mitigation Actions by Hazard and1 Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure			X		X			X
Disease Outbreak			X		X			X
Drought			X		X			X
Earthquake			X		X			X
Flood			X		X	X		X
Geologic			X		X			X
Hazardous Materials			X		X			X
Hurricane and Tropical Storm		X	X	X	X			X
Invasive Species			X	X	X			X
Nor'Easter		X	X	X	X			X
Severe Weather		X	X	X	X	X		X
Severe Winter Weather		X	X	X	X			X
Wildfire			X		X			X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.16-1. Town of Newton Hazard Area Extent and Location Map 1

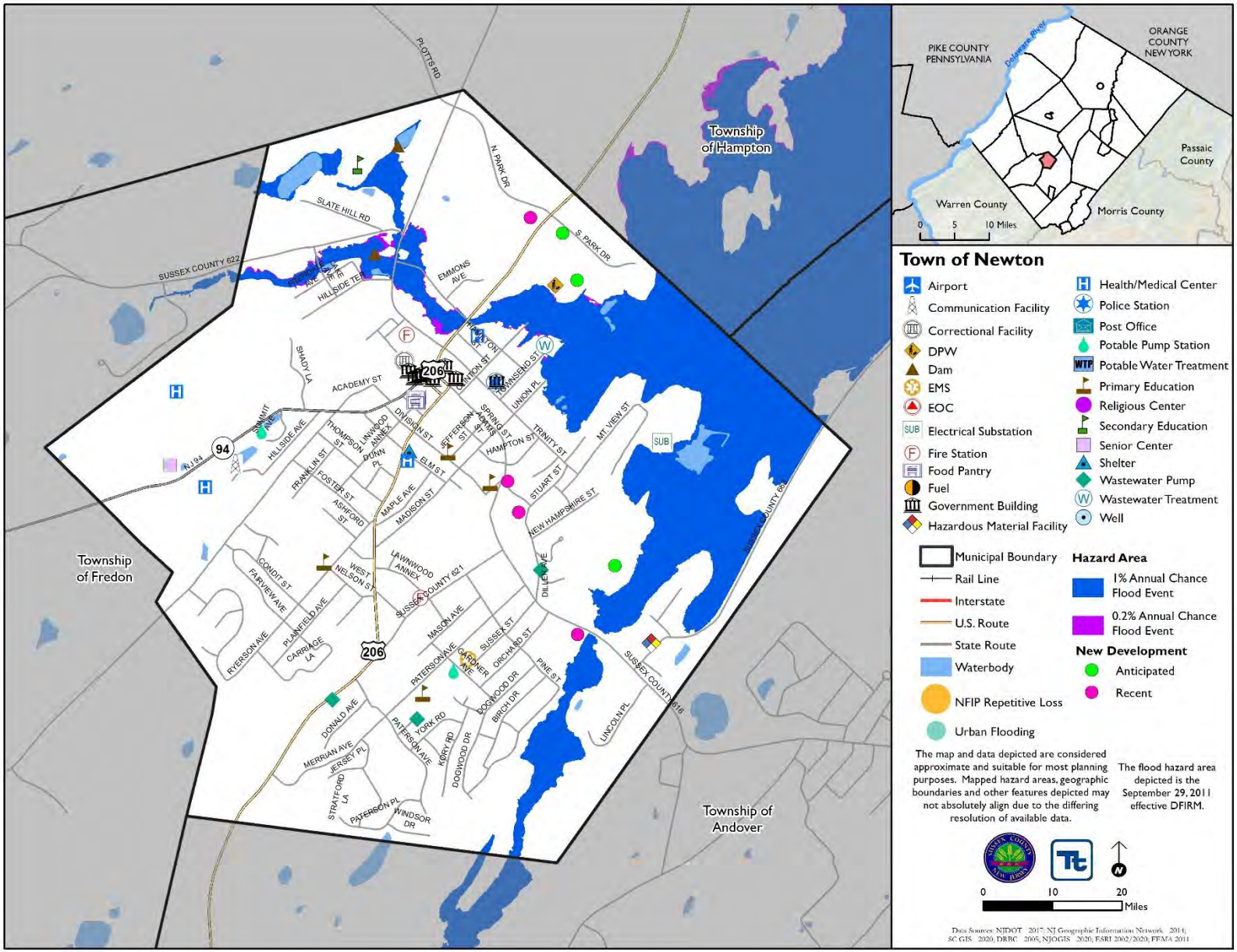


Figure 9.16-2. Town of Newton Hazard Area Extent and Location Map 2

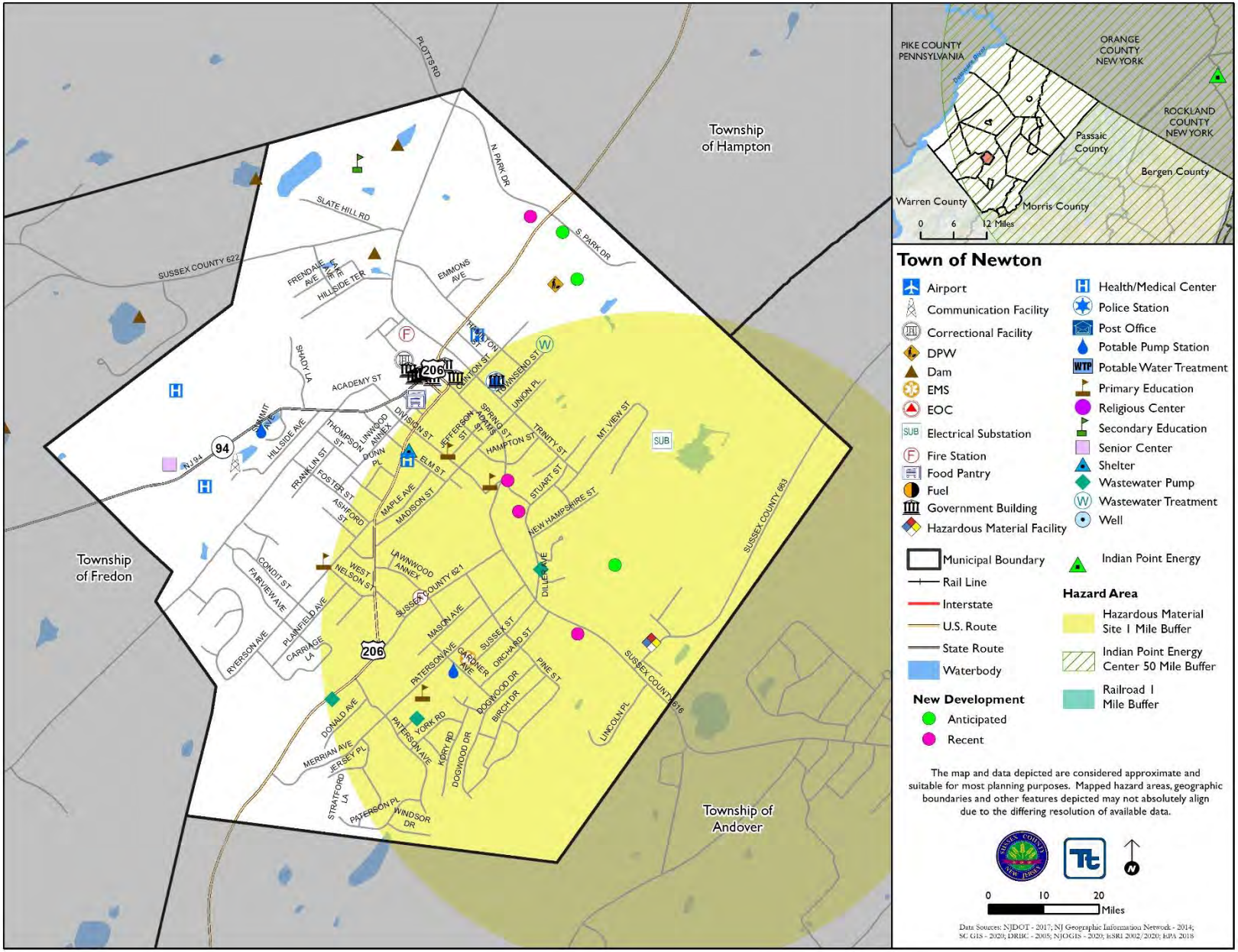
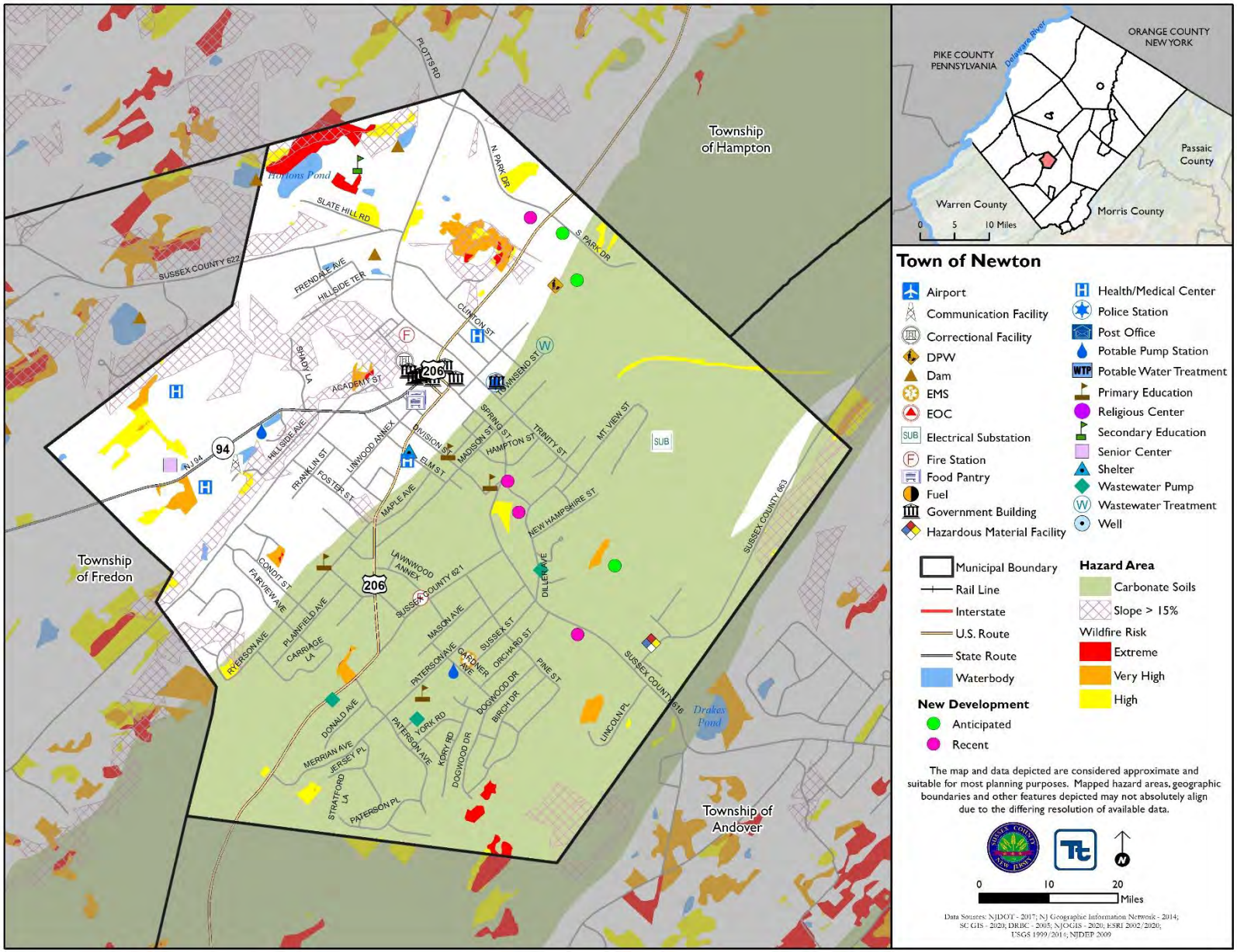


Figure 9.16-3 Town of Newton Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Merriam Avenue School Pump Facility		
Project Number:	2021-Newton-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	The Merriam Avenue School stormwater pump facility is undersized. This results in increased risk of flooding in the surrounding area that is serviced by the pump facility.		
Action or Project Intended for Implementation			
Description of the Solution:	The Town will upgrade the capacity of Merriam Avenue School stormwater pump facility. The Engineer will design the improvements and the DPW will carry out the upgrades.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	TBD by design	**Estimated Benefits (losses avoided):**	Stormwater system improved
Useful Life:	50 years	**Goals Met:**	2
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, Municipal budget
Responsible Organization:	Town DPW and Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, Stormwater management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Replace with new pump station	$500,000	Too expensive
	Build secondary pump station	$500,000	Expensive, space limited

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Merriam Avenue School Pump Facility	
Project Number:	2021-Newton-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Reduces stormwater flood risk
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Town has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	5 years
Agency Champion	1	Town DPW and Engineer
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	DPW Garage Stormwater and Access Upgrades		
Project Number:	2021-Newton-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	The stormwater management system requires upgrade at the DPW Garage located on Moran Street. The Garage also requires improved access.		
Action or Project Intended for Implementation			
Description of the Solution:	The Engineer will design upgrades to the stormwater management system and access way improvements. The DPW will carry out the work.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	TBD by engineering study	**Estimated Benefits (losses avoided):**	Access to DPW maintained
Useful Life:	20 years	**Goals Met:**	2, 3, 6
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, Town budget
Responsible Organization:	Town Engineer, DPW	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, Stormwater management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Relocate DPW	High	Costly
	Close DPW and relocated staff and equipment when flooding is anticipated	Low	Relocation/staging of staff and equipment takes too much time

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	DPW Garage Stormwater and Access Upgrades	
Project Number:	2021-Newton-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Maintains critical services of DPW
Property Protection	1	DPW protected from flooding
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Town has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	Within 5 years
Agency Champion	1	Engineer, DPW
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Municipal Building Wind Designs		
Project Number:	2021-Newton-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Hurricane, Nor'Easter		
Description of the Problem:	The roof of the Newton Municipal Building located on Trinity Street is not designed to withstand high wind.		
Action or Project Intended for Implementation			
Description of the Solution:	The Engineer will design a new roof to meet current standards for high winds on Newton Municipal Building located on Trinity Street. The Town will then replace the roof.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	500-year storm event	**Estimated Benefits (losses avoided):**	Municipal building protected from high winds
Useful Life:	15 years	**Goals Met:**	2, 6
Estimated Cost:	Medium	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP, BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Town Budget
Responsible Organization:	Town Engineer and Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Rebuild facility to new standards	High	Costly and not necessary
	Build secondary facility protected to new standards	High	Costly and not necessary

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Municipal Building Wind Designs	
Project Number:	2021-Newton-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Municipal Building
Property Protection	1	Project will protect Municipal Building from storm damage.
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Town has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Town Engineer and Administration
Other Community Objectives	1	Protection of critical services
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Snow Load Improvements at Fire House #2		
Project Number:	2021-Newton-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Winter Weather, Nor'Easter		
Description of the Problem:	Fire House #2's roof is not designed with modern snow load standards. Failure of the roof could threaten the critical services of the Fire House.		
Action or Project Intended for Implementation			
Description of the Solution:	The Engineer will design a new roof to meet current standards for snow load of Fire House #2 located on Woodside Avenue. The Fire Department will then replace the roof.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	500-year storm event	**Estimated Benefits (losses avoided):**	Fire House designed to withstand snow load
Useful Life:	15 years	**Goals Met:**	1, 2, 6
Estimated Cost:	Medium	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP, BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Town Budget
Responsible Organization:	Town Engineer and Fire Department	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Rebuild facility to new standards	High	Costly and not necessary
	Build secondary facility protected to new standards	High	Costly and not necessary

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Snow Load Improvements at Fire House #2	
Project Number:	2021-Newton-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Failure of the roof could threaten the critical services of the Fire House.
Property Protection	1	Project will protect Fire House #2 from storm damage.
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Town has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Winter Weather, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Town Engineer and Fire Department
Other Community Objectives	1	Protection of critical services
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Automatic Standby Generators at Critical Facilities		
Project Number:	2021-Newton-009		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. The Public Works Maintenance Building lacks a backup power source.		
Action or Project Intended for Implementation			
Description of the Solution:	The Engineer will research what size generators are needed to power each facility. The Town will then purchase and install the selected generators and necessary electrical components to supply backup power to the facilities.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of critical facilities
Useful Life:	20 years	**Goals Met:**	1, 2, 6
Estimated Cost:	$50,000 per generator	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Engineer, OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbines	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Automatic Standby Generators at Critical Facilities	
Project Number:	2021-Newton-009	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of critical facilities.
Property Protection	1	Project will protect facilities from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Town has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Engineer, OEM
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

9.17 BOROUGH OF OGDENSBURG

This section presents the jurisdictional annex for the Borough of Ogdensburg. The annex includes a general overview of the Borough of Ogdensburg; an assessment of the Borough of Ogdensburg's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.17.1 Hazard Mitigation Planning Team

The following individuals are the Borough of Ogdensburg's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.17-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Richard Keslo, Emergency Management Address: 14 Highland Avenue, Ogdensburg, NJ 07439 Phone Number: (201) 400-9873 Email: OFDchief251@yahoo.com	Name / Title: George P. Hutnick, Mayor Address: 14 Highland Avenue, Ogdensburg, NJ 07439 Phone Number: (973) 903-1239 Email: oburgmayor@gmail.com
NFIP Floodplain Administrator	
Name / Title: George P. Hutnick, Mayor Address: 14 Highland Avenue, Ogdensburg, NJ 07439 Phone Number: (973) 903-1239 Email: oburgmayor@gmail.com	

Name	Title	Method of Participation
Richard Keslo	Emergency Management	Primary point of contact; attended the kickoff meeting
George P. Hutnick	Mayor	Alternate point of contact, NFIP floodplain administrator

9.17.2 Jurisdiction Profile

The Borough of Ogdensburg is located in eastern Sussex County. It bordered to the north by Franklin Borough, to the east by Sparta Township and Hardyston Township, and to the south and west by Sparta Township. The Borough has a total area of approximately 2.3 square miles. South Ogdensburg is an unincorporated community located within the Borough. The Wallkill River and its tributaries flow through the Borough. Heaters Pond is large pond that is located along the Borough's eastern border.

According to the U.S. Census, the 2010 population for the Borough of Ogdensburg was 2,410. The estimated 2018 population was 2,314, a 4.0 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 3.6 percent of the population is 5 years of age or younger and 15.9 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.17.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.16-2 summarizes recent and expected future development trends, including major

residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.17-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units										
Multi-Family										
Other (commercial, mixed-use, etc.)										
Property or Development Name	**Type of Development**		**# of Units / Structures**		**Location** (address and/or block and lot)		**Known Hazard Zone(s)***		**Description / Status of Development**	
Recent Major Development and Infrastructure from 2015 to Present										
Add new entries using https://arcg.is/0iSa8X										
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years										
Add new entries using https://arcg.is/0iSa8X										

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.17.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Borough of Ogdensburg performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Borough of Ogdensburg identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

PLANNING, LEGAL AND REGULATORY CAPABILITY

The table below summarizes the legal and regulatory tools that are available to the Borough of Ogdensburg and where hazard mitigation has been integrated.

Table 9.17-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Borough is responsible for this code in compliance with State Uniform Construction Code Act (N.J.S.A. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Borough is responsible for this code in compliance with Chapter 30, Land Development.* • *The Ordinance notes the objective to secure safety from fire, flood, panic, and other natural and manmade disaster.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Borough is responsible for this code in compliance with Land Development.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The DPW is responsible for this ordinance in compliance with Chapter 502 – Drainage, September 15, 2006.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	Yes – if municipality has a	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
			Planning Board		
Comment: • *State Mandated on a municipal level. See Zoning Ordinance; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	County & Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.*					
Environmental Protection	Yes	Local	No	Yes	-
Comment: • *The Borough is responsible for this code in compliance with Chapter 30, Land Development.* • *The Ordinance notes the objective to protect the environmentally sensitive portions of the Borough.*					
Flood Damage Prevention	Yes	Local	Yes	Yes	2021-Ogdensburg-004
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Engineering Department is responsible for Chapter 20 Flood Damage Prevention.* • *The Flood Damage Prevention Ordinance lacks the state mandated freeboard requirement.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	Yes	Local	No	Yes	-
Comment: • *Chapter 3 Police Regulations discusses the role of the Police Department in the Borough.* • *Chapter 13 Fire Prevention and Protection notes the role of the Ogdensburg Fire Department in fire prevention activities.*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other:	No	-	No	-	-
Comment:					
Planning Documents					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen commissioners with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Borough Council is responsible for this plan, which was adopted in December 2008.*					
Capital Improvement Plan	No	-	No	-	-
Comment:					
Disaster Debris Management Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Floodplain or Watershed Plan	Yes	Local	No	Yes	-
Comment: *The Borough Council is responsible for this plan. The Borough has identified flood areas mapped.*					
Stormwater Management Plan	Yes	Local	Yes	Yes/No	Yes/No
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The Borough Council is responsible for this plan in compliance with Stormwater Management Plan, November 2007.*					
Stormwater Pollution Prevention Plan	Yes/No	If yes, who enforces?	Yes	Yes/No	Yes/No
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Habitat Conservation Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	Yes/No	If yes, who enforces?	Yes – if located in a coastal zone	Yes/No	Yes/No
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Community Forest Management Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Climate Action Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Tourism Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Business Development Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Other: Open Space Plan	Yes	Local	No	Yes	-
Comment: • *The Borough Council is responsible for this plan in compliance with the Master Plan.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Borough Council is responsible for this plan in compliance with Emergency Operations Plan, November 2011.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					
Public Health Plan	Yes/No	Yes/No	No	Yes/No	Yes/No
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Other: Strategic Recovery Planning Report	Yes	Local	No	Yes	-
Comment: • *The Borough Council is responsible for this report in compliance with Strategic Growth Plan, February 2005.*					

Table 9.17-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes/No
Does your jurisdiction have the ability to track permits by hazard area?	Yes/No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes/No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Borough of Ogdensburg.

Table 9.17-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Land Use Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	No	-
Open Space Board / Committee	No	-
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes/No	
Maintenance program to reduce risk	Yes	What departments?
Mutual aid agreements	Yes	What departments?
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Borough Engineer
Engineers or professionals trained in building or infrastructure construction practices	No	-
Planners or engineers with an understanding of natural hazards	Yes	Borough Engineer
Staff with training in benefit/cost analysis	Yes	Borough Engineer
Staff with training in green infrastructure	Yes/No	
Staff with education/knowledge/training in low impact development	Yes/No	
Surveyor	Yes	Contracted
Stormwater engineer	Yes/No	
Personnel skilled or trained in GIS applications	Yes	Borough Engineer
Local or state water quality professional	Yes/No	

Staff/Personnel Resource	Available?	Department/Agency/Position
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	??
Watershed planner	Yes/No	
Environmental specialist	Yes/No	
Grant writers	Yes	Borough Engineer
Resilience Officer	Yes/No	
Other: NFIP Floodplain Administrator	Yes	Borough Engineer
Other: Professionals trained in conducting damage assessments	Yes	Borough Engineer

Fiscal Capability

The table below summarizes financial resources available to the Borough of Ogdensburg.

Table 9.17-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes/No
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Ogdensburg.

Table 9.17-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes/No
Do you have personnel skilled or trained in website development?	Yes/No
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes/No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	Yes/No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	Yes/No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes/No

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Ogdensburg.

Table 9.17-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	TBD		
Public Protection (Fire ISO Protection Class)	TBD		
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

NP = Not participating.

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.17-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Weak
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

- Does the municipality have access to resources to determine the possible impacts of climate change upon the municipality? Yes/No – if yes, describe briefly

- Is the administrative supportive of integrating climate change in policies or actions? Yes/No – if yes, describe briefly
- Is climate change already being integrated into current policies/plans or actions (projects/monitoring) within the municipality? Yes/No – if yes, describe briefly

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.17-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineer
Who is your floodplain administrator? (name, department/position)	Eugene Buczynski, P.E., Engineer
Are any certified floodplain managers on staff in your jurisdiction?	???
What is the date that your flood damage prevention ordinance was last amended?	???
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program exceeds minimum requirements.
When was the most recent Community Assistance Visit or Community Assistance Contact?	???
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	???
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	???
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA would consider attending continuing education and/or certification training on floodplain management if it were offered and if authorized by the Borough's governing body. The FPA indicated that the Borough's Emergency Management Coordinator and DPW Supervisor would possible attend the training as well.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	11 policies $3,719,000 insurance in force $8,879 premium in force
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	9 claims $49,122 in payments
Do you maintain a list of properties that have been damaged by flooding?	Yes
Do you maintain a list of property owners interested in flood mitigation?	???

**According to FEMA statistics as of October 13, 2020*
Source: FEMA 2020

Additional Areas of Existing Integration

- Placeholder for areas of additional integration regarding committees/departments that tie to mitigation capability. Bulleted list.

Opportunities for Future Integration

- **Flood Damage Prevention Ordinance:** The Borough will update the Flood Damage Prevention Ordinance to include freeboard (2021-Ogdensburg-004).

9.17.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Borough of Ogdensburg's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.16-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.17-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	???
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	???
	Isaias??			???

Source: FEMA 2020, NOAA NCEI 2020

9.17.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Borough of Ogdensburg risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Ogdensburg that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Ogdensburg has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Ogdensburg.

- Number of repetitive loss (RL) properties: 2
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.17-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
None identified			

Source: Sussex County Planning Partnership 2020

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The Borough has two repetitive loss properties.
- Ogdensburg Public School requires backup power.
- Ogdensburg Fire House requires backup power.
- The Borough's Flood Damage Prevention Ordinance lacks the state mandated freeboard requirement.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Borough of Ogdensburg ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Borough of Ogdensburg. The Borough of Ogdensburg has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Borough of Ogdensburg agreed with the calculated hazard rankings.

Table 9.17-13. Borough of Ogdensburg Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.17.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.16-15 and Table 9.16-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.17-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Ogdensburg-1 (old #4)	Implement the engineering study conducted on Heaters Pond – armor the dam on the pond and stabilize the bank of Heaters Pond.	Engineering, Borough administration			
Ogdensburg-2 (new)	Upgrade the emergency warning system in the Borough, including additional fire sirens.	Fire Department, OEM			
Ogdensburg-3 (new)	Implement Reverse 911 system for the Borough	OEM, Township Administration			
Ogdensburg-4 (new)	Implement a debris clearing program of the Wallkill River and Saw Mill Brook	Engineering and DPW, working with contractors and local utilities			
Ogdensburg-5 (old #9)	Continue to enhance and develop the Borough's public outreach and education programs for hazard mitigation and preparedness.	Elected Official's Office			
Ogdensburg-6 (revised old #3)	Ensure continuity of operations at critical facilities. At this time the following is identified: purchase and install backup generators at the following critical facilities: • First Aid Squad • Meadow Road pump station • Fire Department	Engineering, OEM	In Progress	X	2021-Ogdensburg-001, 2021-Ogdensburg-002

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Ogdensburg-7	Stream bank stabilization (vegetation addition) on Middle Sawmill Brook from RR tracks to Route 517.	Engineering, Borough Administration			
Ogdensburg-8 (revised old #1)	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition/relocation to protect structures from future damage, with repetitive loss and severe repetitive loss properties as a priority when applicable. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Engineering via NFIP FPA with NJOEM, FEMA support	In Progress	X	2021-Ogdensburg-003

In addition to the above progress, the Borough of Ogdensburg identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- List any other mitigation projects you completed that were not identified in the 2016 plan
-

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Ogdensburg participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Ogdensburg participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.16-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Ogdensburg would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.16-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.17-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Ogdensburg-001	Ogdensburg Public School Backup Power	**Problem**: Backup power sources are necessary to maintain critical services for critical facilities. The Ogdensburg Public School (100 Main St, Ogdensburg, NJ 07439) requires a backup power source. The school is a K-8 school and would serve as a shelter in place shelter during a sudden hazard event. **Solution:** The Engineer will research what size generator is needed to power the Ogdensburg Public School. The Borough will then purchase and install the selected generator and necessary electrical components to supply backup power to the Ogdensburg Public School.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter	1	Engineer, School District, OEM	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Ensures continuity of operations of Ogdensburg Fire House	$50,000	Within 5 years	High	SIP	ES
2021-Ogdensburg-002	Ogdensburg Fire House Backup Power	**Problem**: Backup power sources are necessary to maintain critical services for critical facilities. The Ogdensburg Fire Department (718 Ford St, Ogdensburg, NY 13669) requires a backup power source. **Solution:** The Engineer will research what size generator is needed to power the Ogdensburg Fire House. The Borough will then purchase and install the selected generator and necessary electrical components to supply backup power to the Ogdensburg Fire House.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter	1	Engineer, Fire Department, OEM	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Assistance to Firefighters Grant Program, Municipal Budget	Ensures continuity of operations of Ogdensburg Fire House	$50,000	Within 5 years	High	SIP	SP
2021-Ogdensburg-003	Repetitive Loss Mitigation	**Problem**: Frequent flooding events have resulted in damages to residential properties. These properties have been repetitively flooded as documented by	Existing	Flood, Severe Weather	2	NFIP Floodplain Administrator,	FEMA HMGP and FMA, local cost share	Eliminates flood damag	$1 Million	3 years	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		paid NFIP claims. The Borough has 2 repetitive loss properties but other properties may be impacted by flooding as well. **Solution:** Conduct outreach to 10 flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone areas that experience frequent flooding (high risk areas).				supported by homeowners	by residents	e to homes and residents, creates open space for the municipality increasing flood storage.					
2021-Ogdensburg-004	Flood Damage Prevention Ordinance Update	**Problem:** The Borough's Flood Damage Prevention Ordinance lacks the state mandated freeboard requirement. **Solution:** The Borough will update the Flood Damage Prevention Ordinance to include the freeboard requirement.	New	Flood	2	FPA, Administration	Township budget	Meet state standards, reduce future flood risk	Staff time	6 months	High	LPR	PR
		Problem: **Solution:**											
		Problem: **Solution:** **Solution:**											

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC Program	*Building Resilient Infrastructure and Communities*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.17-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Ogdensburg-001	Ogdensburg Public School Backup Power	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High ⚠
2021-Ogdensburg-002	Ogdensburg Fire House Backup Power	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Ogdensburg-003	Repetitive Loss Mitigation	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2021-Ogdensburg-004	Flood Damage Prevention Ordinance Update	0	1	1	1	1	1	1	1	1	1	0	1	1	1	12	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.17-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure								
Disease Outbreak								
Drought								
Earthquake								
Flood	X	X						
Geologic								
Hazardous Materials								
Hurricane and Tropical Storm					X			
Invasive Species								
Nor'Easter					X			
Severe Weather		X			X			
Severe Winter Weather					X			
Wildfire								

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.17-1. Borough of Ogdensburg Hazard Area Extent and Location Map 1

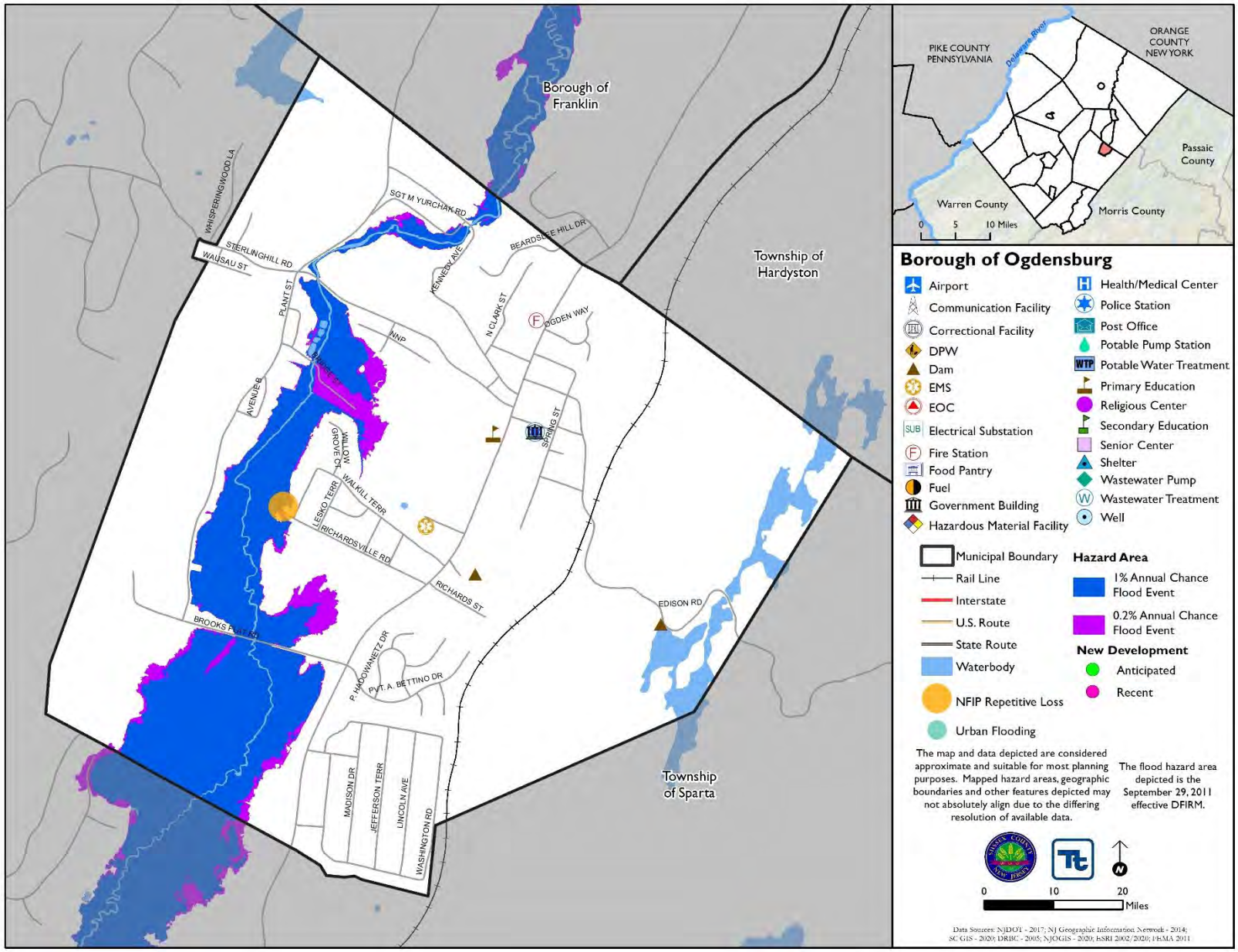


Figure 9.17-2. Borough of Ogdensburg Hazard Area Extent and Location Map 2

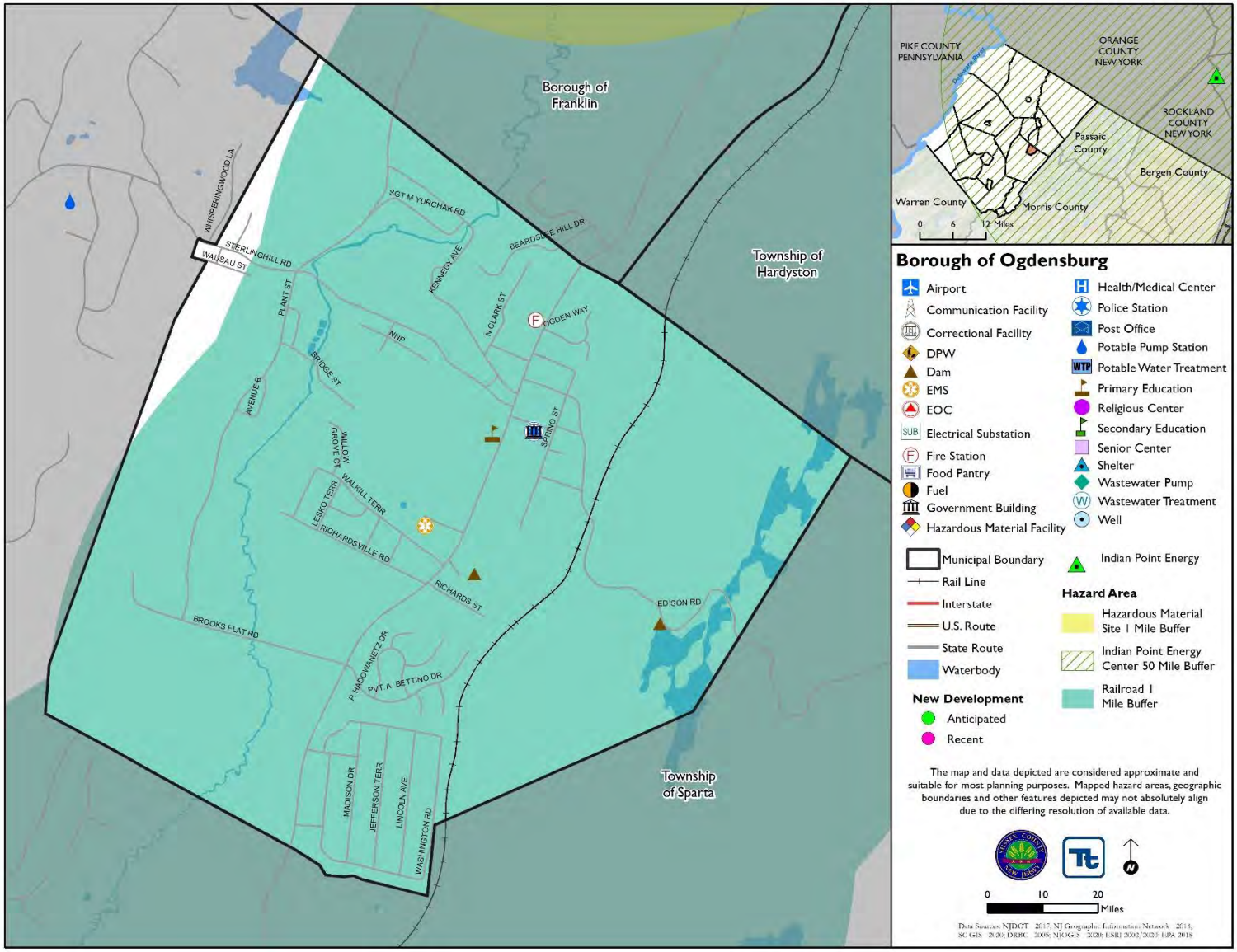
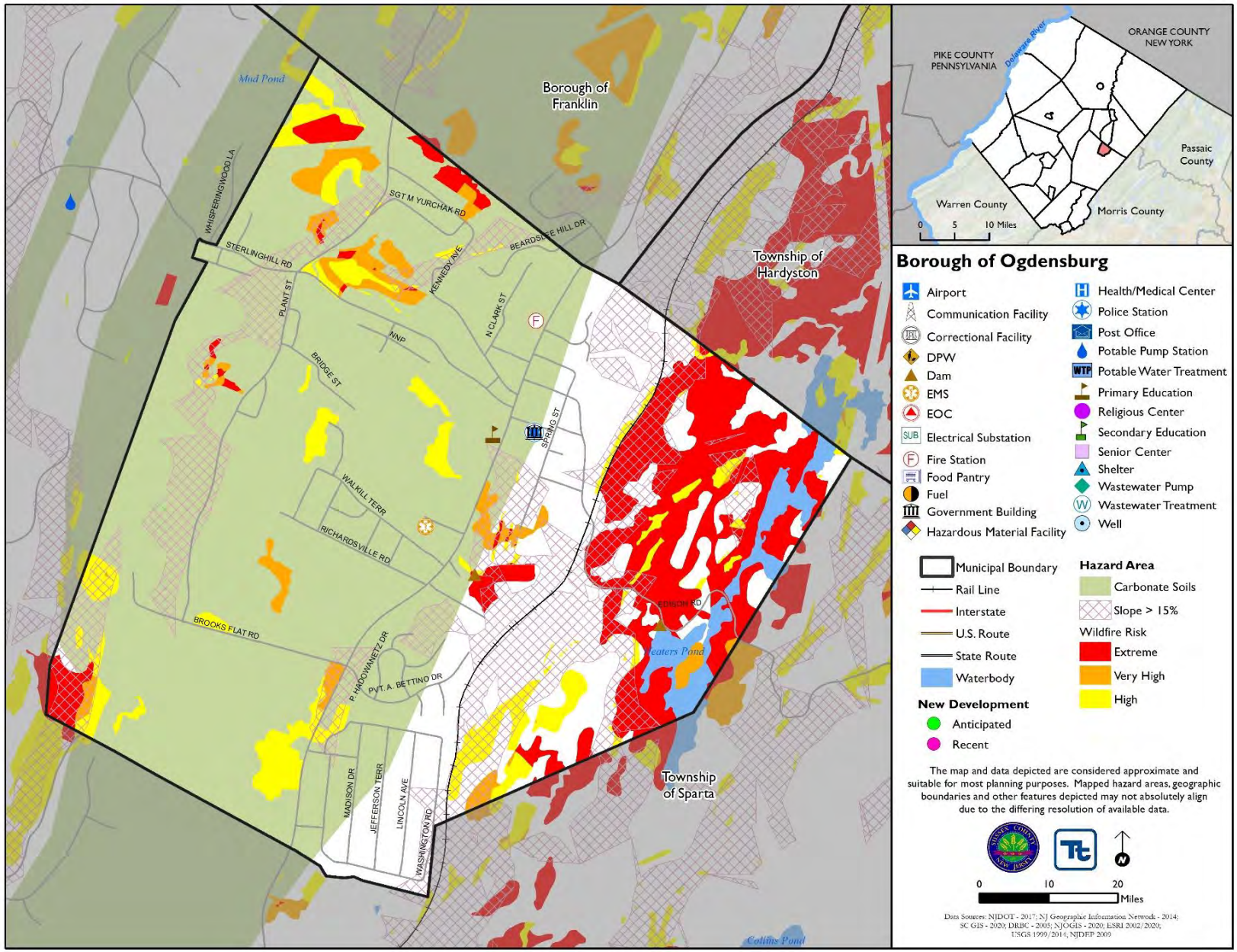


Figure 9.17-3 Borough of Ogdensburg Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Ogdensburg Public School Backup Power		
Project Number:	2021-Ogdensburg-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. The Ogdensburg Public School (100 Main St, Ogdensburg, NJ 07439) requires a backup power source. The school is a K-8 school and would serve as a shelter in place shelter during a sudden hazard event.		
Action or Project Intended for Implementation			
Description of the Solution:	The Engineer will research what size generator is needed to power the Ogdensburg Public School. The Borough will then purchase and install the selected generator and necessary electrical components to supply backup power to the Ogdensburg Public School.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of Ogdensburg Fire House
Useful Life:	20 years	**Goals Met:**	1
Estimated Cost:	$50,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Engineer, School District, OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Ogdensburg Public School Backup Power	
Project Number:	2021-Ogdensburg-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Ogdensburg Public School
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Engineer, School District, OEM
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Ogdensburg Fire House Backup Power		
Project Number:	2021-Ogdensburg-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. The Ogdensburg Fire Department (718 Ford St, Ogdensburg, NY 13669) requires a backup power source.		
Action or Project Intended for Implementation			
Description of the Solution:	The Engineer will research what size generator is needed to power the Ogdensburg Fire House. The Borough will then purchase and install the selected generator and necessary electrical components to supply backup power to the Ogdensburg Fire House.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of Ogdensburg Fire House
Useful Life:	20 years	**Goals Met:**	1
Estimated Cost:	$50,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Assistance to Firefighters Grant Program, Municipal Budget
Responsible Organization:	Engineer, Fire Department, OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Ogdensburg Fire House Backup Power	
Project Number:	2021-Ogdensburg-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Ogdensburg Fire House
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Engineer, Fire Department, OEM
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Repetitive Loss Mitigation		
Project Number:	2021-Ogdensburg-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Frequent flooding events have resulted in damages to residential properties. These properties have been repetitively flooded as documented by paid NFIP claims. The Borough has 2 repetitive loss properties but other properties may be impacted by flooding as well.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to 10 flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone areas that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	2
Estimated Cost:	$1Million	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Three years	**Potential Funding Sources:**	FEMA HMGP and FMA, local cost share by residents
Responsible Organization:	NFIP Floodplain Administrator, supported by homeowners	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$500,000	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$500,000	Elevated roadways would not protect the homes from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Repetitive Loss Mitigation	
Project Number:	2021-Ogdensburg-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Borough has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would remove families from the flood prone areas of the Borough.
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	
Agency Champion	1	NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

9.18 TOWNSHIP OF SANDYSTON

This section presents the jurisdictional annex for the Township of Sandyston. The annex includes a general overview of the Township of Sandyston; an assessment of the Township of Sandyston's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.18.1 Hazard Mitigation Planning Team

The Township of Sandyston followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.18-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Shane Houghtaling, Emergency Mgmt Address: 133 Route 645, Sandyston, NJ 07826 Phone Number: 973-222-5533 Email: oem@sandystontownship.com	Name / Title: Amanda F. Lobban, RMC, Municipal Clerk Address: 133 Route 645, Sandyston, NJ 07826 Phone Number:(973-948-3520 x200 Email: clerk@sandystontownship.com
NFIP Floodplain Administrator	
Name / Title: Robert W. Huber, Construction Official Address: 133 Route 645, Sandyston, NJ 07826 Phone Number: (973) 948-3520 x201 Email: deputyclerk@sandystontownship.com	

Name	Title	Method of Participation
Shane Houghtaling	Emergency Management	Primary point of contact, mitigation strategy development
Amanda F. Lobban	Municipal Clerk	Alternate point of contact, mitigation strategy development; attended the kickoff meeting and annex training and mitigation strategy workshop; reviewed the critical asset inventory; assisted with public outreach (Facebook); provided information and data for the updated annex
Robert W. Huber	Construction Official	NFIP floodplain administrator
Stanley J. Dutkus	Emergency Management	Attended kickoff meeting; reviewed the critical asset inventory

9.18.2 Jurisdiction Profile

Sandyston Township is a small rural township located in the northwestern portion of Sussex County. It has a total area of 43.3 square miles. The Township is bordered to the north by Montague Township, to the south by Frankford, Walpack, and Hampton Townships, to the east by Wantage and Frankford Townships, and to the west by Pennsylvania. The Delaware River makes up the entire western border of the Township. Big Flat Brook, Little Flat Brook, and Tuttles Corner Brook are all streams located within the Township. The following

unincorporated communities are located within the Township: Shaytown, Hainesville, Abertown, Layton, Bevans, Tuttles Corner, and Normanook.

According to the U.S. Census, the 2010 population for the Township of Sandyston was 1,998. The estimated 2018 population was 1,925, a 3.6 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 5.9 percent of the population is 5 years of age or younger and 19.8 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.18.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.17-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.18-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	0	0	1	1	1	1	2	0	1	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0	0	0	0	0	0
Property or Development Name	**Type of Development**		**# of Units / Structures**		**Location** (address and/or block and lot)		**Known Hazard Zone(s)***		**Description / Status of Development**	
Recent Major Development and Infrastructure from 2015 to Present										
None identified.										
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years										
None anticipated.										

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.18.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Sandyston performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance

- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Sandyston identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Sandyston and where hazard mitigation has been integrated.

Table 9.18-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Building Department is responsible for this code in compliance with State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Zoning Department is responsible for this code in compliance with Chapter 150- Zoning.* • *The purpose of this chapter is to contribute to and provide for the recreational developments in the Delaware Valley; to promote and protect the health, safety and general welfare of the public; to preserve the present environment, rural in character, insofar as possible and conserve forest cover and streams; to provide for an orderly development of service zones; to implement the design of a residential community dedicated to the preservation of open space with population densities in harmony with the geology and water resources of the Flatbrook Watershed.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *The Building Department is responsible for this ordinance in compliance with Chapter 137 – Subdivision and Site Plan Review.*					
Stormwater Management	Yes	State & Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *Chapter 138 Stormwater Control* • *It is the purpose of this chapter to establish minimum stormwater management requirements and controls for major development.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	Yes – if municipality has a Planning Board	-	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Building Department is responsible for these requirements in compliance with Chapter 137 – Subdivision and Site Plan Review.*					
Environmental Protection	Yes	Local	No	Yes	-
Comment: • *Chapter 85 Hazardous Wastes* • *Chapter 100 Littering* • *Chapter 141 Trees*					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	-
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Construction Official is responsible for this ordinance in compliance with Chapter 75- Flood Damage Prevention.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *It is the purpose of this chapter to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:* o *A. Protect human life and health.* o *B. Minimize expenditure of public money for costly flood-control projects.* o *C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public.* o *D. Minimize prolonged business interruptions.* o *E. Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, bridges located in areas of special flood hazard.* o *F. Help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas.* o *G. Ensure that potential buyers are notified that property is in an area of special flood hazard.* o *H. Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.* • *The Ordinance includes the state's 1-foot freeboard requirement.*					
Wellhead Protection	Yes	Local	No	Yes	-
Comment: • *Chapter 150 Zoning, Article IV General Regulations and Standards establishes that wellhead protection areas may be reserved as open space as necessary.*					
Emergency Management	Yes	Local	No	No	-
Comment: • *Chapter 11, Fire Department, Volunteer* • *Chapter 71, Fire Prevention*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other:	No	-	No	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Township Comm. is responsible for this plan, which was adopted in 2008.*					
Capital Improvement Plan	No	-	No	-	-
Comment:					
Disaster Debris Management Plan	No	-	No	No	2021-Sandyston-006

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The DPW is responsible for this plan in compliance with Storm Water 2005.*					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	No	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	Yes	Local	No	No	-
Comment: *The Township Comm. is responsible for this plan in compliance with the 2008 Master Plan.*					
Shoreline Management Plan	-	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other: Open Space Plan	Yes	Local	No	Yes	-
Comment: • *The Township Comm. is responsible for this plan in compliance with Master Plan 2008.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The OEM is responsible for this plan, which was adopted in August of 2013.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	No	-	No	-	-
Comment:					
Other	No	-	No	-	-
Comment:					

Table 9.18-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Building Department
Does your jurisdiction have the ability to track permits by hazard area?	No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No Much of the Township is preserved lands associated with the Delaware Water Gap park system.

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Township of Sandyston.

Table 9.18-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Land Use/Zoning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	No	-
Open Space Board / Committee	No	-
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	No	-
Maintenance program to reduce risk	No	-
Mutual aid agreements	Yes	Sussex County
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Harold Pellow Assoc. J. Caldwell and Associates
Engineers or professionals trained in building or infrastructure construction practices	Yes	Harold Pellow Assoc.
Planners or engineers with an understanding of natural hazards	Yes	As per need, Bids for Prof. Services.
Staff with training in benefit/cost analysis	No	-
Staff with training in green infrastructure	Yes	Harold Pellow Assoc.
Staff with education/knowledge/training in low impact development	Yes	Harold Pellow Assoc.
Surveyor	Yes	Daniel Kent Inc.
Stormwater engineer	Yes	Harold Pellow Assoc.
Personnel skilled or trained in GIS applications	No	-
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Township Emergency Management Coordinator
Watershed planner	No	-
Environmental specialist	No	-
Grant writers	No	-
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Construction Official
Other: Professionals trained in conducting damage assessments	Yes	As per need, Bids for Prof. Services.

Fiscal Capability

The table below summarizes financial resources available to the Township of Sandyston.

Table 9.18-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Unsure
Capital Improvements Project Funding	CFO & Township Committee
Authority to Levy Taxes for Specific Purposes	Tax Asser
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	CFO & Township Committee

Financial Resource	Accessible or Eligible to Use?
Incur Debt through Special Tax Bonds	CFO & Township Committee
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	CFO & Township Committee
Development Impact Fees for Homebuyers or Developers	Township Committee
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Sandyston.

Table 9.18-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	No
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes Emergency info posted
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	Yes—Facebook page for information. Share Sheriff's page.
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	No

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Sandyston.

Table 9.18-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	Fire Department – 10	25 plus years ago.
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

N/A = Not Applicable. NP = Not Participating. - = Unavailable. TBD = To Be Determined.

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words,

it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.18-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) – Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.18-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Construction
Who is your floodplain administrator? (name, department/position)	Robert W. Huber, Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	November 2013
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program exceeds the minimum set by FEMA and the State.
When was the most recent Community Assistance Visit or Community Assistance Contact?	January 27, 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No

Criterion	Response
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA would welcome continuing education and certification training on floodplain management.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No, however, the Township has considered joining and would attend a CRS seminar if offered.
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	8 policies
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	5 claims $209,806 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

9.18.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Sandyston's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.17-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.18-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	None identified
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	The Township sought $3,250 in reimbursements for teleworking equipment and cleaning supplies.

Source: FEMA 2020, NOAA NCEI 2020

9.18.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Sandyston risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Sandyston that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Sandyston has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Sandyston.

- Number of repetitive loss (RL) properties: 1
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.18-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
Sandyston Township Building	Post Office		X
21-6 Kittatinny Lake Dam	Dam	X	X
21-13 Flat Brook Valley Dam	Dam	X	X
21-18 Stony Lake Dam	Dam	X	X
21-23 Lake Ashroe Dam	Dam	X	X
21-26 Morgan Pond Dam	Dam	X	X
21-28 Lance Mill Dam	Dam	X	X
21-49 Harper Dam	Dam	X	X
22-113 Skellinger Lake Dam	Dam	X	X

Source: Sussex County Planning Partnership 2020
Note:
**Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- Scattered privately-owned homesites are located along the Delaware River. Some of these properties are located in the Special Flood Hazard Area, with development requiring floodproofing.
- Little Flat Brook crosses Degroat Road just east of the road's intersection with Route 206. The Brook experiences occasional riverine flooding.
- Lack of forest management of federal and private lands has increased fire risk for residents of Sandyston.

- Lake communities in Sandyston face snow removal issues owing to a lack of suitable land on which snow can be cleared from roads and placed.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Sandyston ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Sandyston. The Township of Sandyston has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Sandyston agreed with the calculated hazard rankings.

Table 9.18-13. Township of Sandyston Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	High

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.18.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.17-15 and Table 9.17-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.18-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update? Check if Yes	Include in the 2021 HMP Update? Enter 2021 HMP Action #
Sandyston-1 (new)	Sandyston Township Sunrise Communications Tower Generator	Township OEM	Completed using a FEMA grant; project total $6,173.		

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Sandyston-2 (new)	To ensure continuity of operations at critical facilities and municipal buildings, install generator Wiring at Municipal Complex	Township OEM	Completed using a FEMA grant; project total $9,300.		
Sandyston-3 (new)	Emergency Generator for DPW Garage & Fire Station #2	Township OEM	Completed using a FEMA grant; project total $21,000.		
Sandyston-4 (old #1)	Implement Fire Wise Program throughout the Township.	Fire Department, OEM	Ongoing Capability		
Sandyston-5 (old #2)	Conduct all-hazards public education and outreach program for hazard mitigation and preparedness.	Township OEM	Ongoing Capability (Follow-up)		
Sandyston-6 (new)	Install early warning devices in the Township.	Fire Department	In Progress	X	2021-Sandyston-001
Sandyston-7 (new)	Protect school building from severe weather related incidents	Board of Education	No Progress	X	2021-Sandyston-002
Sandyston-8 (new)	Purchase a mini pumper four-wheel drive unit with extended crew cab to support wildland and structural fires.	Fire Department	No Progress	X	2021-Sandyston-003
Sandyston-9 (new)	Work with the PUC and FCC for regulations requiring phone providers to maintain phone service during loss of power.	Township	Ongoing Capability		
Sandyston-10 (new)	Protect roadway crossing the Delaware River from damages and debris during hazard events.	Private Toll Bridge Owner/Operator	No progress	X	2021-Sandyston-005
Sandyston-11 (new)	Initiate a program to verify that all dams in the community meet the state safety requirements.	NJDEP, Dam Owners, Township	Ongoing Capability		

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Sandyston participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Sandyston participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for*

Reducing Risk to Natural Hazards (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.17-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Sandyston would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.17-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.18-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Sandyston-001	Sandyston Early Warning Systems	**Problem**: Sandyston Township has an early warning siren for hazard events. The sirens are located at Fire Stations #1 and #2. Fire Station #1 is located near the Sandyston Township Municipal Building along CR-645 and Fire Station #2 is located in Layton on CR-560/Tuttles Corner-Dingmans Ferry Road. Station #2's early warning siren is broken and is no longer functional, thereby limiting a source of emergency communications for residents in the northern portion of the Township. **Solution:** The Township proposes to replace and augment its early warning capabilities at the Fire Station with a siren with enhanced reach and functionality.	New & Existing	All Hazards	1, 5	OEM	HMGP; BRIC; Township Funds	Increased emergency warnings	Low	Within 3 years	High	LPR	ES
2021-Sandyston-002	Sandyston-Walpack School Retrofits	**Problem**: The Sandyston-Walpack School building is not protected from severe weather events. **Solution:** The Township and Board of Education propose to retrofit the school building to withstand hazard events such as snowfall.	Existing	Severe Weather; Severe Winter Weather	1, 2	Sandyston-Walpack Board of Education	Board of Education; Township funds	Increased ability to withstand hazards	Medium	Within five years	High	SIP	PP
2021-Sandyston-003	Brush Truck and Utility Truck Acquisition	**Problem**: Sandyston Township is a largely rural and wooded community. Roads in the Township are narrow, and brush fires require a quick response by the Department. Additionally, a large portion of Sandyston is preserved open space associated with the Delaware Water Gap. The high amount of visitation and tourism associated with the recreation facilities magnifies the importance of emergency response from the Township, though it has limited resources to acquire equipment and vehicles. **Solution:** The Township proposes to purchase a brush truck and utility truck	New	Earthquake; Flood Geologic; Hazardous Materials Hurricane and Tropical Storm; Nor'Easter; Severe Weather; Severe Winter Weather; Wildfire	1, 2, 5, 6	Fire Department	Assistance to Firefighters Grant Program; Township funds	Enhanced response for fire facilities	Medium	Within five years	$150,000	SIP	ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		to augment the Township's response to fire and rescue incidents. The brush truck is the first line of defense in a brush fire and can traverse rough terrain. The utility truck will tow the Township's utility terrain vehicle in the case of emergency. The acquisition would enable enhanced response from the Township's fire department and greater capabilities during all types of hazard events. The Utility Truck will tow the UTV to emergency locations where traditional towing vehicles cannot navigate due to road size or terrain limitations.										
2021-Sandyston-004	Phone Service Retention	**Problem**: Sandyston Township experiences cable outages that impact phone lines during severe storm events. **Solution:** The Township proposes to work with the PUC and FCC to enact regulations requiring phone providers to maintain phone service during loss of power.	Existing	All Hazards	1, 2, 3, 4, 5, 6	Century Link; Optimum; PUC	Staff time/Township funds	Increased phone/ cable reliability	Low	Within five years	High	LPR	PI
2021-Sandyston-005	Delaware River Bridge Retrofit	**Problem**: The Dingman's Ferry bridge is the primary access road between the Township and Pennsylvania. The Bridge is privately owned and vulnerable to flooding. **Solution:** The Township proposes to protect the roadway crossing the Delaware River from damages and debris during hazard events. The Township will work with the bridge's owners, the County, and NJDEP to protect the bridge from debris during a flood.	Existing	Flood Geologic; Hazardous Materials Hurricane and Tropical Storm; Nor'Easter; Severe Weather; Severe Winter Weather;	1, 2, 5, 6	NJDEP; Sussex County; Private owners; Township Administration	Private funds; BRIC; NJDOT; HMGP	Continued bridge access following hazard events	High	Within five years	High	SIP	PP
2021-Sandyston-006	Disaster Debris Management Plan	**Problem**: The Township lacks a Disaster Debris Management Plan. **Solution:** The Township will develop and adopt a Disaster Debris Management Plan. The Plan will include any	N/A	All Hazards	5	Township OEM, Administration	Township budget	Increased disaster capabilities	Staff time	2 years	High	LPR	ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		necessary mutual aid discussions to supplement the Township's capabilities.											
2021-Sandyston-007	Reverse 911	**Problem**: The Township lacks a reverse 9-1-1 notification system to warn residents about hazard events. **Solution:** The Township proposes to acquire and implement a reverse 9-1-1 notification system to inform all residents of hazard events and make the Township safer.	New	All Hazards	1, 3, 4, 6	Township OEM, Administration	Township budget	Enhanced warning capabilities to safeguard residents	Low	Within three years	High	EAP	PI
2021-Sandyston-008	Repetitive Loss Properties	**Problem**: Frequent flooding events have resulted in damages to residential properties. These properties have been repetitively flooded as documented by paid NFIP claims. The Township has 1 repetitive loss property but other properties may be impacted by flooding as well. **Solution:** Conduct outreach to 30 flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone areas that experience frequent flooding (high risk areas).	Existing	Flood, Severe Weather	2	NFIP Floodplain Administrator, supported by homeowners	FEMA HMGP and FMA, local cost share by residents	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.	$500,000	3 years	High	SIP	PP
2021-Sandyston-009	Firewise Participation	**Problem**: The Township had participated in the Firewise program between 2014-2019, and the plan has now expired. The Township seeks to re-enter the Firewise program. **Solution:** The Township proposes to undertake the documentation and process necessary to re-enter the Firewise program and undertake associated mitigation activities.	Existing	Wildfire	5	Township OEM: Fire Department; NFPA; NJ State Forest Service	Staff Time	Enhanced community preparedness	Low – staff time	Within one year	High	LPR	ES

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

BRIC	*Building Resilient Infrastructure and Communities*
FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.18-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Sandyston-001	Sandyston Early Warning Systems	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High ⚠
2021-Sandyston-002	Sandyston-Walpack School Retrofits	1	1	1	1	1	1	0	1	1	0	1	1	1	1	12	High
2021-Sandyston-003	Mini-Pumper and Utility Truck Acquisition	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2021-Sandyston-004	Phone Service Retention	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2021-Sandyston-005	Delaware River Bridge Retrofit	1	1	1	1	1	0	0	1	1	0	1	1	1	1	11	High
2021-Sandyston-006	Disaster Debris Management Plan	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2021-Sandyston-007	Reverse 911	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2021-Sandyston-008	Repetitive Loss Properties	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2021-Sandyston-009	Firewise Participation	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High

Notes: *Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.*
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.18-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure	X		X					X
Disease Outbreak	X		X					X
Drought	X		X					X
Earthquake	X		X			X		X
Flood	X	X	X			X		X
Geologic	X		X			X		X
Hazardous Materials	X		X			X		X
Hurricane and Tropical Storm	X		X			X		X
Invasive Species	X		X					X
Nor'Easter	X		X			X		X
Severe Weather	X	X	X			X		X
Severe Winter Weather	X		X			X		X
Wildfire	X		X		X	X		X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard

ORANGE medium ranked hazard

YELLOW low ranked hazard

Figure 9.18-1. Township of Sandyston Hazard Area Extent and Location Map 1

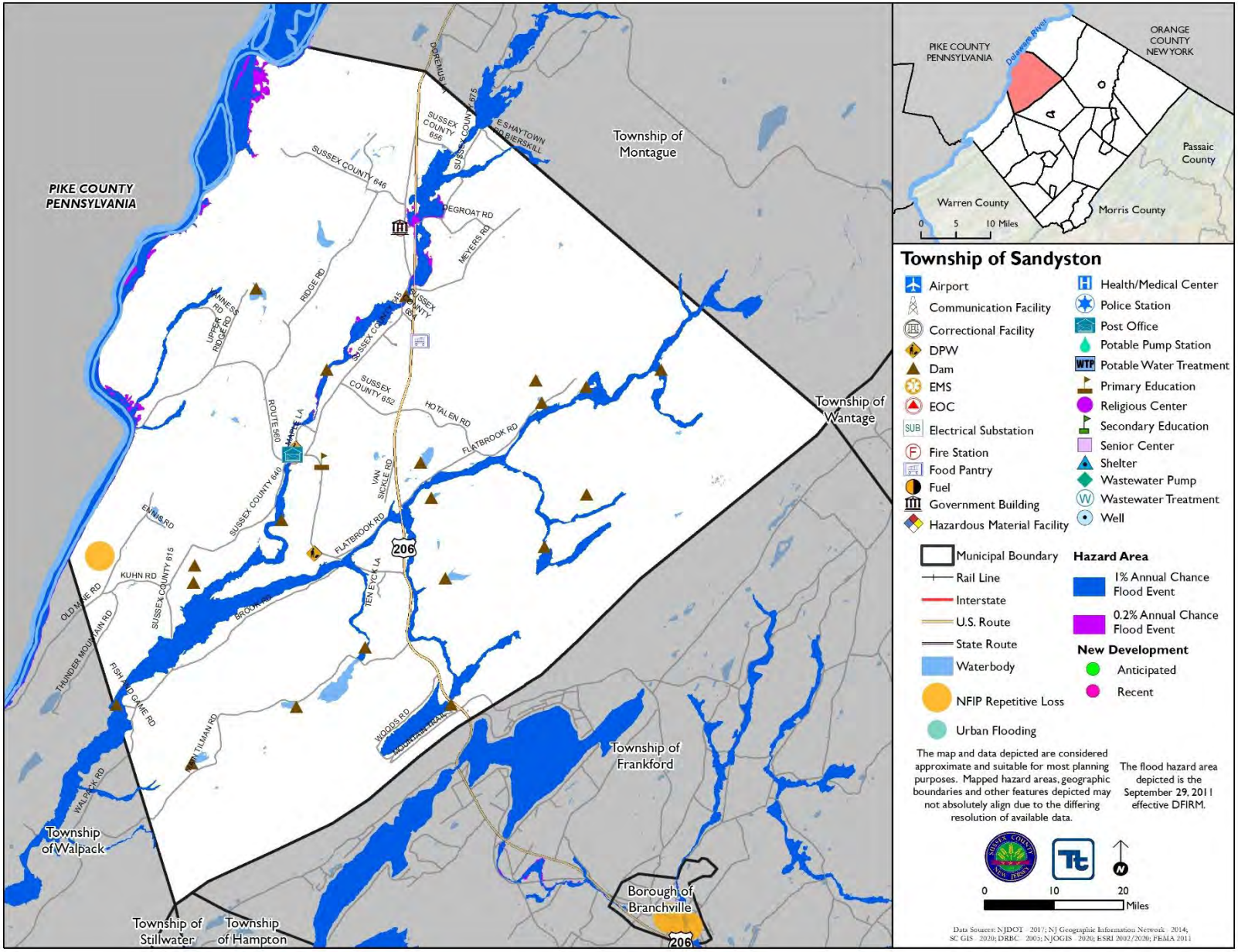


Figure 9.18-2. Township of Sandyston Hazard Area Extent and Location Map 2

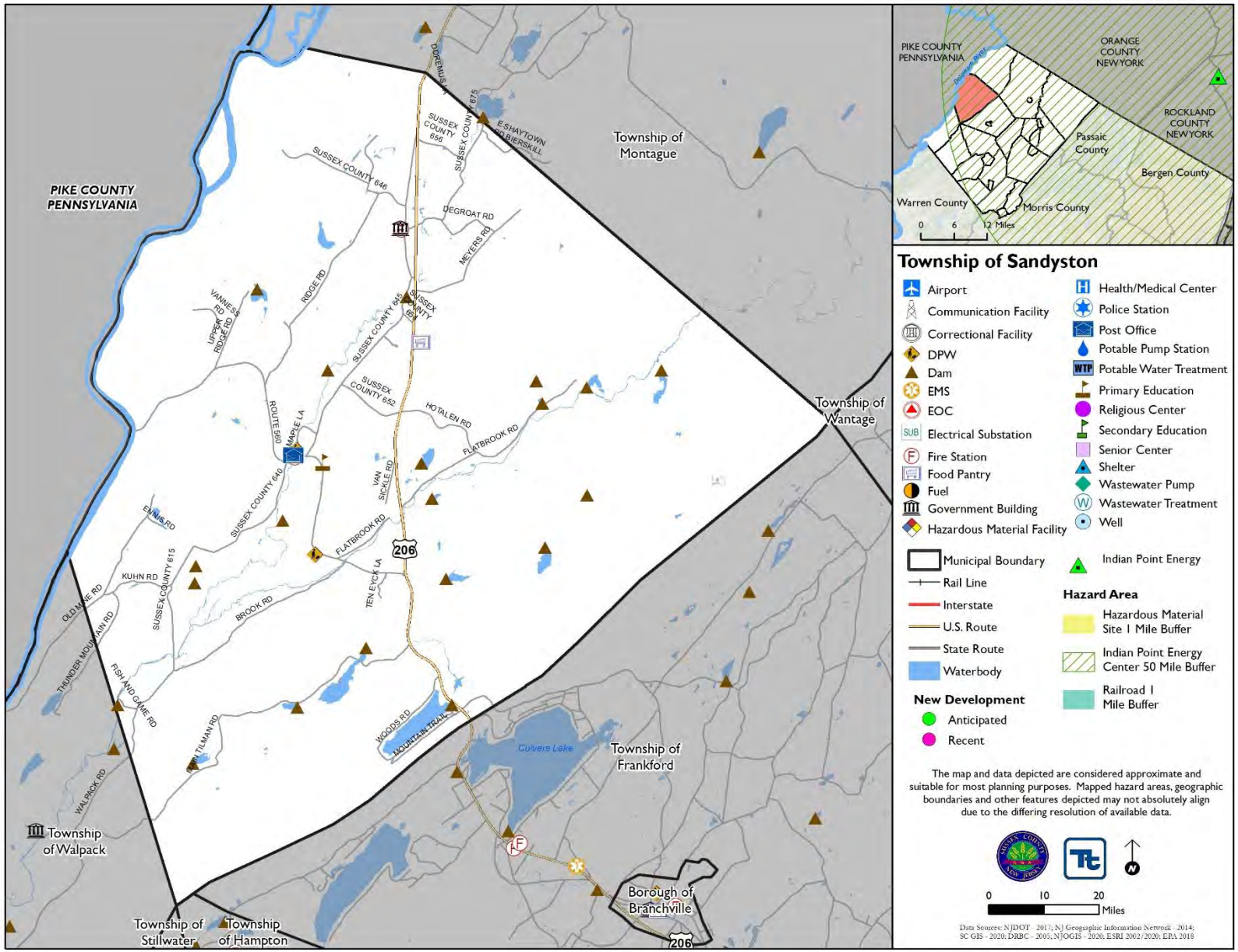
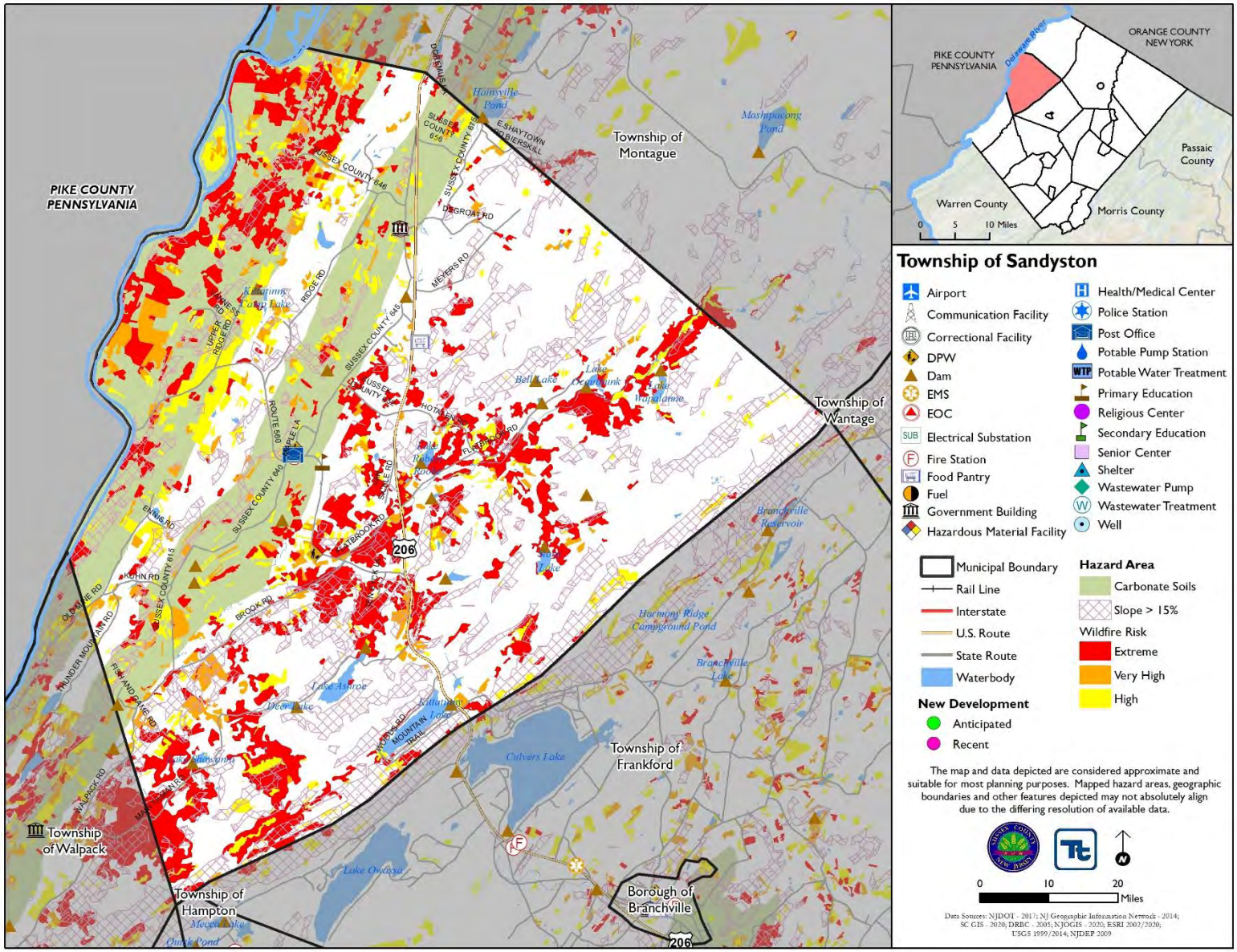


Figure 9.18-3 Township of Sandyston Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Sandyston Early Warning Systems		
Project Number:	2021-Sandyston-001		
Risk / Vulnerability			
Hazard(s) of Concern:	All Hazards		
Description of the Problem:	Sandyston Township has an early warning siren for hazard events. The sirens are located at Fire Stations #1 and #2. Fire Station #1 is located near the Sandyston Township Municipal Building along CR-645 and Fire Station #2 is located in Layton on CR-560/Tuttles Corner-Dingmans Ferry Road. Station #2's early warning siren is broken and is no longer functional, thereby limiting a source of emergency communications for residents in the northern portion of the Township.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township proposes to replace and augment its early warning capabilities at the Fire Station with a siren with enhanced reach and functionality.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Increased emergency warnings
Useful Life:	30 years	**Goals Met:**	1, 5
Estimated Cost:	Low	**Mitigation Action Type:**	Local Plans and Regulations
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within three years
Estimated Time Required for Project Implementation:	6 months	**Potential Funding Sources:**	HMGP; BRIC; Township Funds
Responsible Organization:	Township OEM; Fire Department	**Local Planning Mechanisms to be Used in Implementation if any:**	-

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	Sirens fail	$0	Response inhibited
	Alternate communications	Medium	Cost prohibitive
	Siren enhancements	Low	Enhanced response capabilities

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Sandyston Early Warning Systems	
Project Number:	2021-Sandyston-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require capital funding.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Addresses all hazards
Timeline	1	
Agency Champion	1	Township OEM; Fire Department
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Delaware River Bridge Retrofit		
Project Number:	2021-Sandyston-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood; Geologic; Hazardous Materials; Hurricane and Tropical Storm; Nor'Easter; Severe Weather; Severe Winter Weather		
Description of the Problem:	The Dingman's Ferry bridge is the primary access road between the Township and Pennsylvania. The Bridge is privately owned and vulnerable to flooding.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township proposes to protect the roadway crossing the Delaware River from damages and debris during hazard events. The Township will work with the bridge's owners, the County, and NJDEP to protect the bridge from debris during a flood.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Continued bridge access following hazard events
Useful Life:	30 years	**Goals Met:**	1, 2, 5, 6
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within five years
Estimated Time Required for Project Implementation:	2 years	**Potential Funding Sources:**	Private funds; BRIC; NJDOT; HMGP
Responsible Organization:	NJDEP; Sussex County; Private owners; Township Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	-

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	High	Bridge damage
	Bridge abandonment/reconstruction	High	Not feasible
	Bridge retrofit	High	Most cost effective

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Delaware River Bridge Retrofit	
Project Number:	2021-Sandyston-005	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	
Property Protection	1	
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	0	
Fiscal	0	Project will require capital funding from public/private
Environmental	1	
Social	1	
Administrative	0	
Multi-Hazard	1	Addresses all hazards
Timeline	1	
Agency Champion	1	NJDEP; Sussex County; Private owners; Township Administration
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Repetitive Loss Properties		
Project Number:	2021-Sandyston-008		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	Frequent flooding events have resulted in damages to residential properties. These properties have been repetitively flooded as documented by paid NFIP claims. The Township has 1 repetitive loss property but other properties may be impacted by flooding as well.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to flood-prone property owners, including RL/SRL property owners and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone areas that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	2
Estimated Cost:	$500,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Three years	**Potential Funding Sources:**	FEMA HMGP and FMA, local cost share by residents
Responsible Organization:	NFIP Floodplain Administrator, supported by homeowners	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$500,000	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$500,000	Elevated roadways would not protect the homes from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Repetitive Loss Properties	
Project Number:	2020-Sandyston-008	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would remove families from the flood prone areas of the Township.
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	
Agency Champion	1	NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

9.19 TOWNSHIP OF SPARTA

This section presents the jurisdictional annex for the Township of Sparta. The annex includes a general overview of the Township of Sparta; an assessment of the Township of Sparta's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.19.1 Hazard Mitigation Planning Team

The Township of Sparta followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.19-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Neil Spidaletto, OEM Coordinator Address: 65 Main Street, Sparta, NJ 07871 Phone Number: (973) 729-6121 Email: nspidaletto@spartapd.org	Name / Title: William Close, Deputy OEM Coordinator Address: 65 Main Street, Sparta, NJ 07871 Phone Number: (973) 726-3600 Email: william.close@spartanj.org
NFIP Floodplain Administrator	
Name / Title: Stan Puszcz, P.E., Township Engineer Address: 11 Park Lake Road, Sparta, NJ 07871 Phone Number: 973-300-9003 Email: stan.puszcz@cpengineers.com	

Name	Title	Method of Participation
Neil Spidaletto	OEM Coordinator	Primary point of contact; attended the kickoff meeting, annex training, risk assessment meeting and mitigation strategy workshop; provided data and information for the annex update
William Close	Deputy OEM Coordinator	Alternate point of contact
Stan Puszcz, P.E.	Township Engineer	NFIP floodplain administrator; attended the annex training and risk assessment meeting; provided data and information for the annex update
John Cahillane	Engineer	Provided data and information, contributed to the mitigation strategy
Thomas McIntyre	Deputy OEM Coordinator	Attended the annex training

9.19.2 Jurisdiction Profile

Sparta Township is located in southwestern Sussex County and has a total area of 38.9 square miles. The Township is bordered to the north by Lafayette and Hardyston Townships, to the south by Byram Township and Hopatcong Borough, to the east by Morris County and to the west by Andover and Lafayette Townships. Streams that flow through Sparta Township include: Wallkill River and its tributaries, Russia Brook tributaries, Sparta Junction Brook, Wildcat Branch, Sparta Glen Brook, Tar Hill Brook tributaries, and Lubbers Run

tributaries. Lake Mohawk is a large lake located in the southwest corner of the Township. Other lakes and ponds are located throughout the Township as well. The following unincorporated communities are located within the Township: Ackerson, Woodruffs Gap, Houses Corner, Sparta Junction, Sussex Mills, Upper Mohawk, and Lake Mohawk.

According to the U.S. Census, the 2010 population for the Township of Sparta was 19,722. The estimated 2018 population was 18,841, a 4.5 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 5.3 percent of the population is 5 years of age or younger and 13.7 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.19.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.18-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.19-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	2	0	1	0	7	0	22	0	95	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	6	0	3	0	1	0	7	0	5	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
North Village	Residential/Commercial	100+ Residential Units & 8 Commercial	Block 16001, Lots 4.02, 5, 6, 7, 8, 89, & 91.01	Railway Incident Hazard Area, Hazardous Material Incident Area, Nuclear Incident Hazard Area, Carbonate Soil	95% Complete
White Lake Technical Center	Commercial	8-10 Commercial Sites	Block 16001, Lots 14-21; Block 16003, Lots 1-5	Railway Incident Hazard Area, Nuclear Incident Hazard Area, Carbonate Soil	75% Complete
Gas Light Court	Residential	18 Single Family Homes	Block 27006, Lots 5-7 & 12-29	Railway Incident Hazard Area, Carbonate	50% Complete

				Soil, Steep Slopes, Nuclear Incident Area, Wildfire	
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None Identified					

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.19.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Sparta performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Sparta identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Sparta and where hazard mitigation has been integrated.

Table 9.19-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *This code follows State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a	Yes	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
			Planning Board		
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *This code follows Chapter 18, Comprehensive Land Management Code.* • *Part of the Code objectives is to secure safety from flood, fire, panic or other natural or man-made disaster.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *This ordinance follows Chapter 18 of the Township Code.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The Engineering Department is responsible for this ordinance in compliance with Chapter 18 of the Township Code.* • *The Township Engineer, Planning Board Engineer, and Zoning Board Engineer have all completed NJDEP stormwater training.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	No	-
Comment: • *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.* • *These ordinance in compliance with Chapter 18.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance. • *The Planning Department is responsible for these requirements in compliance with Chapter 18 of the Township Code.*					
Environmental Protection	Yes	Local	No	Yes	-
Comment: • *Chapter 2-39 of the Township Code establishes and Environmental Commission which is responsible for the protection, development and use of natural resources, with the exception of those duties related to water resources which are under the jurisdiction of the Board of Health.* • *Chapter 18, Comprehensive Land Management Code.* o *Part of the Code objectives is to promote the conservation of open space and valuable natural resources and to prevent urban sprawl and degradation of the environment through improper use of land;* • *Chapter 25 of the Township Code establishes regulations regarding the use of lawn fertilizer(s) on properties within the Lake Mohawk Country Club.*					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	-
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Construction official is responsible for this ordinance in compliance with Chapter 28 of the Township Code.* • *It is the purpose of this chapter to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed:* o *a. Protect human life and health;* o *b. Minimize expenditure of public money for costly flood control projects;* o *c. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* o *d. Minimize prolonged business interruptions;* o *e. Minimize damage to public facilities and utilities such as water and gas mains, electric telephone and sewer lines, streets and bridges located in areas of special flood hazard;* o *f. Help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;* o *g. Ensure that potential buyers are notified that property is in an area of special flood hazard; and* o *h. Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.*					
Wellhead Protection	Yes	State	Yes	Yes	-
Comment: • *The NJ State Safe Drinking Water Act (N.J.S.A. 58:12A-1) and the Safe Drinking Water Act of 1974 (SDWA) are state and federal acts to protect the quality of drinking water. They do not require local adoption as they are enforced by the NJDEP. Regulations for the Safe Drinking Water Act were adopted in 1977 and amended effective June 1, 2020.*					
Emergency Management	Yes	Federal, State & Local	No	Yes	-
Comment: • *The Office of Emergency Management is established by Chapter 2-27 of the Township Code.*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen commissioners with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *This plan was adopted in 1984.* • *The Planning Department is responsible for this plan in compliance with the Master Plan.*					
Capital Improvement Plan	Yes	Local	No	No	-
Comment: *The Engineering Department and DPW is responsible for this plan.*					
Disaster Debris Management Plan	No	-	No	-	2021-Sparta-009
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The Engineering Department is responsible for this plan, which is an element of the Master Plan.*					
Stormwater Pollution Prevention Plan	Yes	State	Yes	Yes	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.* • *Sparta Township is not located in a coastal area.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	Yes	Local	No	No	-
Comment: *The Planning Department is responsible for this plan, which is an element of the Master Plan.*					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other: Open Space Plan	Yes	Local	No	No	-
Comment: • *The Planning Department is responsible for this plan, which is an element of the Master Plan.*					
Other: Watershed Management or Protection Plan	Yes	Local	No	No	-
Comment: *The Planning Department is responsible for this plan, which is an element of the Master Plan.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Police Department is responsible for this plan in compliance with the Office of Emergency Management.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Public Health Plan	No	-	No	-	-
Comment:					
Other	No	-	No	-	-
Comment:					

Table 9.19-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes; Planning/Zoning Department
Does your jurisdiction have the ability to track permits by hazard area?	No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Sparta.

Table 9.19-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning/Zoning Department
Mitigation Planning Committee	Yes	Public Safety Committee, STEP, CERT
Environmental Board / Commission	Yes	Environmental Commission
Open Space Board / Committee	No	Community Development
Economic Development Commission / Committee	Yes	Community Development
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Department of Public Works & Sparta Police Department
Maintenance program to reduce risk	No	Department of Public Works
Mutual aid agreements	Yes	Sparta Police Department, Fire Department and Surrounding Towns
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Town Engineer
Engineers or professionals trained in building or infrastructure construction practices	Yes	Town Engineer
Planners or engineers with an understanding of natural hazards	Yes	Town Engineer
Staff with training in benefit/cost analysis	Yes	Town Engineer
Staff with training in green infrastructure	Yes	Town Engineer
Staff with education/knowledge/training in low impact development	Yes	Town Engineer
Surveyor	No	-

Staff/Personnel Resource	Available?	Department/Agency/Position
Stormwater engineer	Yes	Town Engineer
Personnel skilled or trained in GIS applications	Yes	Town Engineer
Local or state water quality professional	Yes	Town Engineer
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Police Chief
Watershed planner	Yes	Town Engineer
Environmental specialist	Yes	Town Engineer
Grant writers	Yes	Consultant
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Construction Official

Fiscal Capability

The table below summarizes financial resources available to the Township of Sparta.

Table 9.19-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes: Grant consultant
Capital Improvements Project Funding	Yes: Municipal CFO – Township Engineer
Authority to Levy Taxes for Specific Purposes	Yes: Township Council
User Fees for Water, Sewer, Gas or Electric Service	Yes: Township Council – Utility Director
Incur Debt through General Obligation Bonds	Yes: Township Council – Municipal CFO
Incur Debt through Special Tax Bonds	Yes: Township Council
Incur Debt through Private Activity Bonds	Yes: Township Council
Withhold Public Expenditures in Hazard-Prone Areas	Yes: Township Council
State-Sponsored Grant Programs	Yes: Grant consultant – Township Engineer
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Yes: Grant consultant
Other: Open Space Acquisition Funding Programs	Yes: Township Engineer

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Sparta.

Table 9.19-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	Environmental Commission

Criterion	Response
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Reverse 911, Outdoor warning signals, Township website/social media

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Sparta.

Table 9.19-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	Class 3	2014
Public Protection (Fire ISO Protection Class)	No	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Bronze	2009

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.19-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

The Township does not have access to resources to determine the possible impacts of climate change upon the municipality and is not currently supportive of integrating climate change in policies or actions.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.19-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Construction Department
Who is your floodplain administrator? (name, department/position)	Domenick Carnevale, Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements, but the Township is unsure if the program exceeds requirements.
When was the most recent Community Assistance Visit or Community Assistance Contact?	January 11, 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	RMP - Mainstem Delaware River - FY15 (CTP)
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA would like continuing education and/or certification training on floodplain management.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No, and the Township is not interested in participating.
How many flood insurance policies are in force in your jurisdiction? * -What is the insurance in force? -What is the premium in force?	46 policies $12,578,000 insurance in force $33,046 premium in force
How many total loss claims have been filed in your jurisdiction? * -How many claims are still open or were closed without payment? -What were the total payments for losses?	14 claims $32,999 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
Source: FEMA 2020

9.19.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Sparta's history of

federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.18-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.19-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Closed roadways; Overtime pay to clear roads
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	The Township enforced social distancing and masking mandates and was impacted by various closures due to the coronavirus pandemic.
July 28, 2020 - August 5, 2020	Tropical Storm Isaias	TBD	A tropical storm produced strong winds and heavy rainfall resulting in power outages throughout New Jersey on August 4th	Power outages; Fallen trees and tree branches; Closed roadways

Source: FEMA 2020, NOAA NCEI 2020

9.19.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Sparta risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Sparta that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Sparta has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Sparta.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.19-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
22-16 Lake Grinnell Dam	Dam	X	X
22-63 Lake Mohawk Dam	Dam	X	X
22-106 Ackerson Mill Dam	Dam	X	X
22-108 Flag Pond Dam	Dam	X	X
22-109 Mud Pond Dam	Dam	X	X
22-136 Foulds Pond Dam	Dam	X	X
22-183 Seneca Lake Dam	Dam	X	X
Sparta Junction	Hazardous Material Facility	X	X

Source: Sussex County Planning Partnership 2020
*Note: *Identified lifeline*

Sparta Township's dams are privately owned.

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- There are many lakes, ponds, rivers, streams, and tributaries throughout the Township that are adjacent to developed lots, including Township facilities such as Town Hall and the Township Library. Infrastructure in the Township should be hardened against flooding events to protect continuity of operations.
- Groundwater in the Germany Flats area of Township requires protection from potential contamination.
- The shelter located within the Sparta Ambulance Service building on Sparta Avenue lacks backup power
- The Township would like to use the DPW building located on Prices Lane as a safe room for tornadoes and hurricanes. The Township has already installed a backup generator to support the site.
- Windows of the Germany Flats pump facility are not impact resistant and pose a threat in the event of a high wind event.
- Glen Brook and Wallkill River are prone to erosion of streambanks, threatening homes, roadways, and a JCP&L substation.
- The Township does not participate in the Firewise program. Despite low wildfire risk, the Township is interested in enrollment.
- West Mountain Road floods regularly between the High School football field and Main Street.
- The Township lacks a Disaster Debris Management Plan.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Sparta ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Sparta. The Township of Sparta has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Sparta agreed with the calculated hazard rankings.

Table 9.19-13. Township of Sparta Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	Medium

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.19.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.18-15 and Table 9.18-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.19-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update? Check if Yes	Include in the 2021 HMP Update? Enter 2021 HMP Action #
Sparta-1 (revised old #1)	Ensure continuity of operations at critical facilities. At this time the following was identified: Emergency generator for shelter located within Sparta Ambulance Service building located on Sparta Avenue	Emergency Management	In Progress	X	2021-Sparta-003
Sparta-2 (old #2)	Harden Sparta DPW building located on Prices Lane to FEMA 361 Standards	Emergency Management	In Progress	X	2021-Sparta-004
Sparta-3 (old #3)	Retrofit impact resistant windows and shutters on Germany Flats Pump Facility located on Park Lake Drive.	Emergency Management	In Progress	X	2021-Sparta-005

2016 Action Number Action Description		Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Sparta-4 (old #4)	Stream bank stabilization along Sparta Glen Brook (3500 feet)	Emergency Management	No Progress	X	2021-Sparta-006
Sparta-5 (old #5)	Stream bank stabilization along Wallkill River at Station Park (1500 feet)	Township Engineer	No Progress	X	2021-Sparta-006
Sparta-6 (old #7)	Implement Fire Wise Program throughout the Township.	Fire Department	No Progress	X	2021-Sparta-007
Sparta-7 (revised old #11)	Conduct all-hazards public education and outreach program for hazard mitigation and preparedness. Enhance STEP and CERT programs.	Emergency Management	Ongoing Capability		
Sparta-8 (new)	Replace Culvert at West Mountain Road	Township Engineer	In Progress	X	2021-Sparta-008
Sparta-9 (new)	Lake Grinell Dam/ Spillway Reconstruction	Township Engineer	No Progress; not Township owned		

In addition to the above progress, the Township of Sparta identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- The Township installed emergency generators for the building and fuel island at the DPW facility located on Prices Lane.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Sparta participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Sparta participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.18-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Sparta would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1)

for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.18-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.19-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Sparta-001	Flood Damage Prevention/ Mitigation	**Problem**: There are many lakes, ponds, rivers, streams, and tributaries throughout the Township that are adjacent to developed lots, including Township facilities such as Town Hall and the Township Library. Infrastructure in the Township should be hardened against flooding events to protect continuity of operations. **Solution:** The Township will undertake a feasibility assessment to determine what must be done to harden infrastructure against flooding and construct the cost-effective projects identified to prevent/mitigate flooding damage.	Existing	Flood	2, 6	Engineering, OEM	FEMA HMGP and PDM, BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Township Budget	Protection of infrastructure from flood damages	High	Within 5 years	High	SIP	PR, PP
2021-Sparta-002	Groundwater Quality Protection	**Problem**: Groundwater in the Germany Flats area of Township requires protection from potential contamination. **Solution:** Engineering/utilities will research potential equipment/technologies that could be put in place to protect groundwater. If viable, the Township will work to use these equipment/technologies in the Township's water supply system.	Existing	Hazardous Materials	1, 2, 6	Engineering, Utilities	BRIC, HMGP, Township budget	Protection of groundwater from contamination	High	Within 5 years	High	SIP, NSP	PR, NR
2021-Sparta-003	Backup Power for Sparta Ambulance Service	**Problem**: Backup power sources are necessary to maintain critical services for critical facilities. The shelter located within the Sparta Ambulance Service building on Sparta Avenue lacks backup power. **Solution:** The Engineer will research what size generator is needed to power the Sparta Ambulance Service building. The Township will then purchase and install the selected generator and necessary electrical components to supply backup power to the Sparta Ambulance Service building.	Existing	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather	1, 2, 6	Engineer, OEM	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program,	Ensures continuity of operations of Sparta Ambulance Service building	$50,000	Within 5 years	High	SIP	ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
							Municipal Budget						
2021-Sparta-004	Harden DPW Building	**Problem**: The Township would like to use the DPW building located on Prices Lane as a safe room for tornadoes and hurricanes. The Township has already installed a backup generator to support the site. **Solution:** The Township will work to harden the DPW building using FEMA 361 standards.	Existing	Hurricane, Severe Weather	1, 2, 6	Public Works, Engineer, OEM	HMGP, BRIC, USDA Community Facilities Grant Program, Township budget	Safe Room established	Medium	3 years	High	SIP	PP, ES
2021-Sparta-005	Harden Germany Flats Pump Facility	**Problem**: Windows of the Germany Flats pump facility are not impact resistant and pose a threat in the event of a high wind event. **Solution:** The Township will retrofit impact resistant windows and shutters on Germany Flats Pump Facility located on Park Lake Drive.	Existing	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather	2, 6	OEM, Public Works	HMGP, BRIC, USDA Community Facilities Grant Program, Township budget	Protection of critical facilities	Medium	Within 5 years	Medium	SIP	PP
2021-Sparta-006	Streambank Stabilization	**Problem**: Glen Brook and Wallkill River are prone to erosion of streambanks, threatening homes, roadways, and a JCP&L substation. **Solution:** The Township will determine the proper stream stabilization techniques for a 3,500 feet section of Glen Brook and a 1,500 section of the Walkill River at Station Park. Once the techniques are established, the Township will implement stream stabilization and continue to monitor the locations to measure success and needs for additional measures.	N/A	Flood, Hurricane, Nor'Easter, Severe Weather	2	Engineer	HMGP, BRIC, Township budget	Protect from home damage, road damage, JCP&L substation damage	Medium for Glen Brook, $1M for Wallkill River	Within 5 years	High	NSP	NR
2021-Sparta-007	Firewise	**Problem**: The Township does not participate in the Firewise program. Despite low wildfire risk, the Township is interested in enrollment. **Solution:** The Township will enroll in the Firewise program.	New and Existing	Wildfire	1, 2, 3, 4, 5	OEM	Township budget	Increased wildfire mitigation and preparedness	Staff time	Within 5 years	High	LPR, EAP	PR, ES, PI

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Sparta-008	Culvert at West Mountain Road	**Problem**: West Mountain Road floods regularly between the High School football field and Main Street. **Solution:** The Township will replace the culvert at West Mountain Road and elevate the roadway to allow for larger storm events.	Existing	Severe Weather	2	Engineer	HMGP, BRIC, municipal budget	Alleviate flooding of properties and roadway in the area, including Sparta High School.	$600,000	Within 5 years	High	SIP	SP
2021-Sparta-009	Disaster Debris Management Plan	**Problem**: The Township lacks a Disaster Debris Management Plan. **Solution:** The Township will develop and adopt a Disaster Debris Management Plan.	Existing	All Hazards	3, 6	DPW, OEM	Township budget	Increased disaster response planning	Staff time	1 year	High	LPR	ES

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC	*Building Resilient Infrastructure and Communities Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*

- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.19-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Sparta-001	Flood Damage Prevention/ Mitigation	1	1	1	1	1	1	0	1	1	1	0	0	1	1	11	High ⚠
2021-Sparta-002	Groundwater Quality Protection	1	0	0	1	1	1	0	1	1	1	0	0	1	1	9	High
2021-Sparta-003	Backup Power for Sparta Ambulance Service	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Sparta-004	Harden DPW Building	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Sparta-005	Harden Germany Flats Pump Facility	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Sparta-006	Streambank Stabilization	0	1	1	1	1	0	0	1	1	1	1	0	1	1	10	High
2021-Sparta-007	Firewise	1	1	1	1	1	1	1	1	1	1	0	0	1	1	12	High
2021-Sparta-008	Culvert at West Mountain Road	1	1	0	1	1	1	0	1	0	0	1	0	1	1	9	High
2021-Sparta-009	Disaster Debris Management Plan	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.19-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure					X			
Disease Outbreak					X			
Drought					X			
Earthquake					X			
Flood	X	X		X	X	X		
Geologic					X			
Hazardous Materials		X		X	X			
Hurricane and Tropical Storm		X		X	X			
Invasive Species					X			
Nor'Easter		X		X	X			
Severe Weather		X		X	X			
Severe Winter Weather		X			X			
Wildfire	X		X		X			

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard

ORANGE medium ranked hazard

YELLOW low ranked hazard

Figure 9.19-1. Township of Sparta Hazard Area Extent and Location Map 1

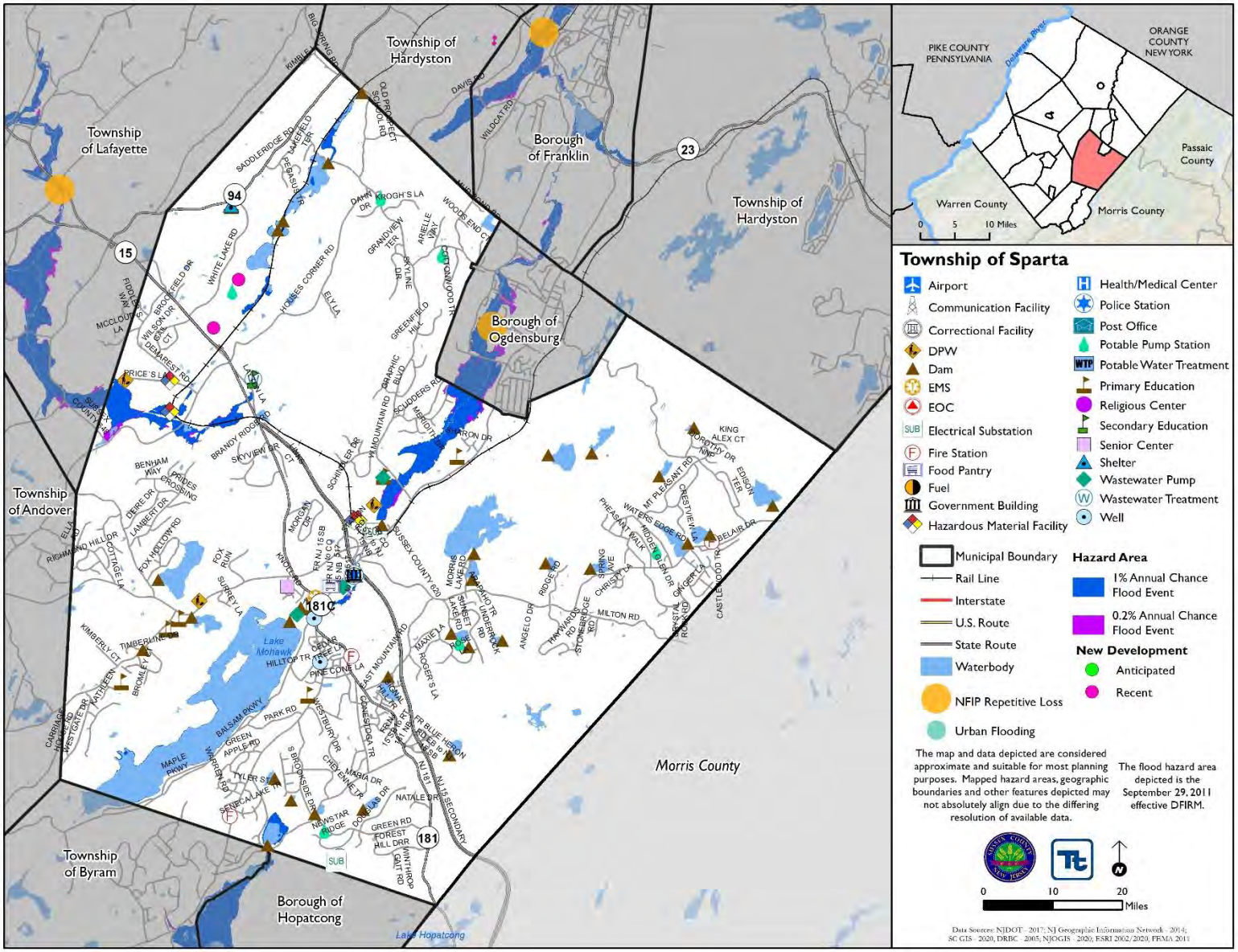


Figure 9.19-2. Township of Sparta Hazard Area Extent and Location Map 2

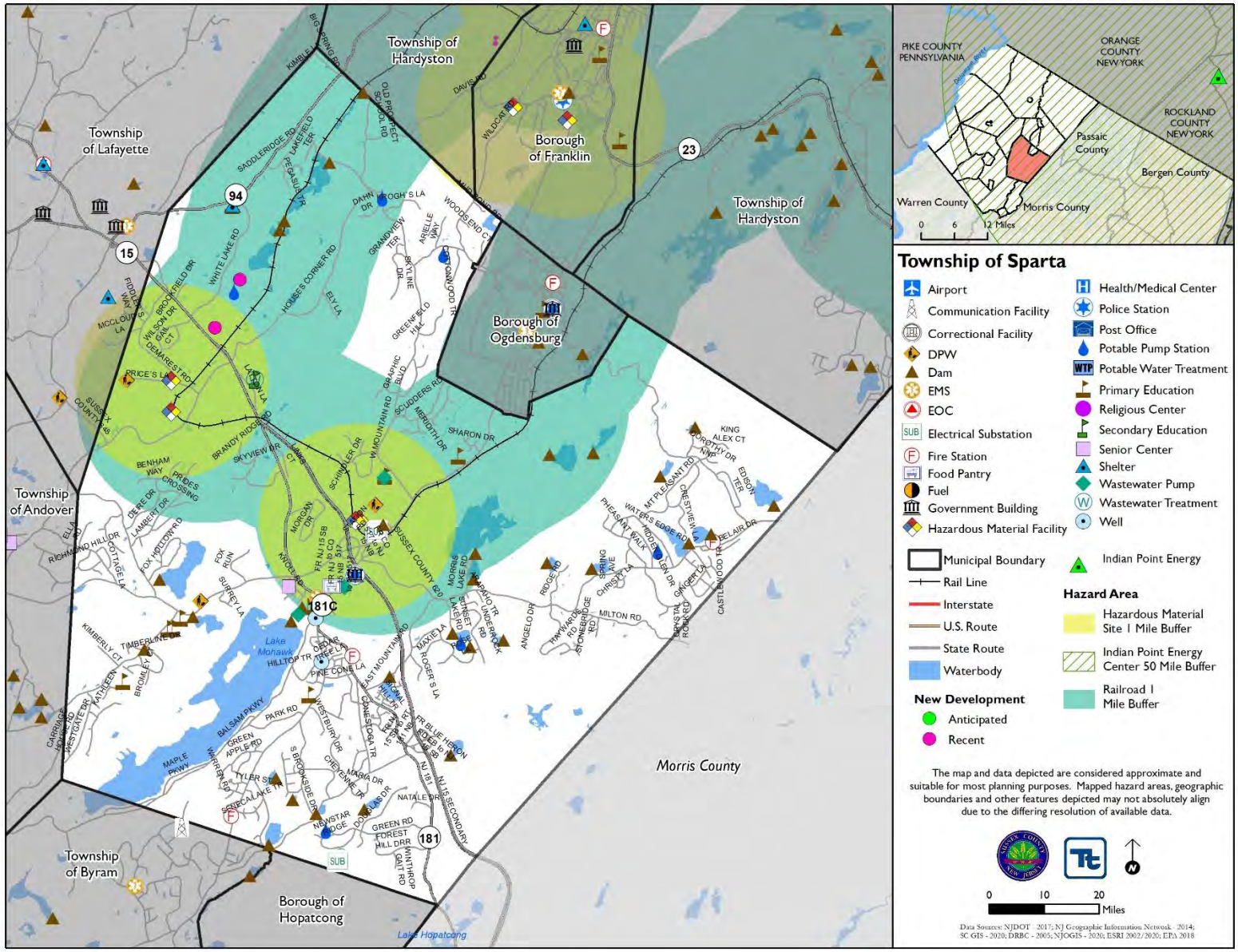
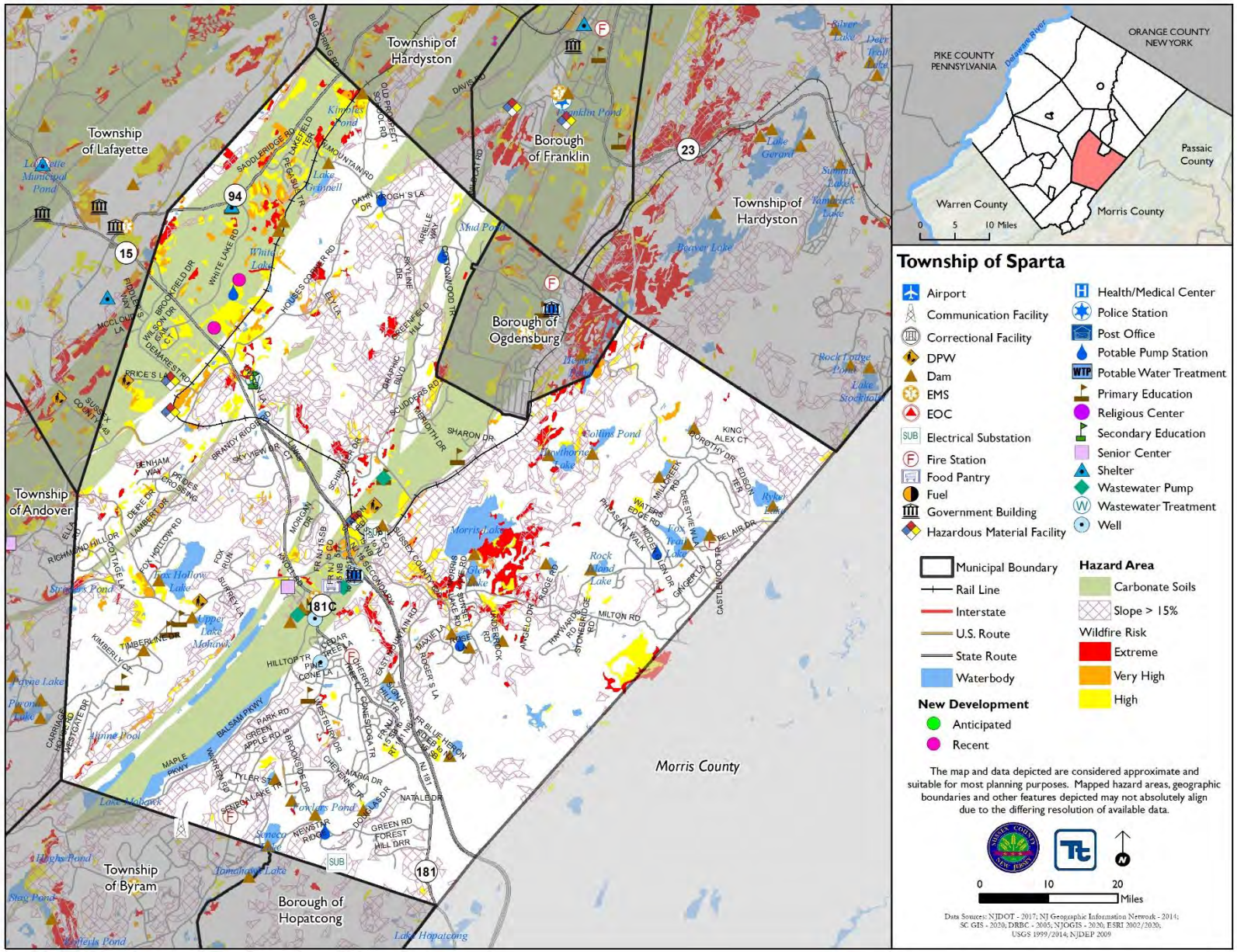


Figure 9.19-3 Township of Sparta Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Flood Damage Prevention/Mitigation		
Project Number:	2021-Sparta-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	There are many lakes, ponds, rivers, streams, and tributaries throughout the Township that are adjacent to developed lots, including Township facilities such as Town Hall and the Township Library. Infrastructure in the Township should be hardened against flooding events to protect continuity of operations.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will undertake a feasibility assessment to determine what must be done to harden infrastructure against flooding and construct the cost-effective projects identified to prevent/mitigate flooding damage.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	500-year flood level	**Estimated Benefits (losses avoided):**	Protects infrastructure from flood damages
Useful Life:	TBD by feasibility assessment	**Goals Met:**	2, 6
Estimated Cost:	TBD by feasibility assessment	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and PDM, BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Township Budget
Responsible Organization:	Engineer, OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Rebuild all infrastructure to higher standards	High	Costly, not necessary
	Set standards for new/replacement infrastructure	Low	Does not protect current infrastructure and replacement process will be slow

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Flood Damage Prevention/Mitigation	
Project Number:	2021-Sparta-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of infrastructure
Property Protection	1	Project will protect critical infrastructure from flood damage.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	Flood
Timeline	0	Within 5 years
Agency Champion	1	Engineer, OEM
Other Community Objectives	1	Protection of critical infrastructure
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Groundwater Quality Protection		
Project Number:	2021-Sparta-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Hazardous Materials		
Description of the Problem:	Groundwater in the Germany Flats area of Township requires protection from potential contamination.		
Action or Project Intended for Implementation			
Description of the Solution:	Engineering/utilities will research potential equipment/technologies that could be put in place to protect groundwater. If viable, the Township will work to use these equipment/technologies in the Township's water supply system.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	TBD by engineering study	**Estimated Benefits (losses avoided):**	Protection of groundwater from contamination
Useful Life:	20 years	**Goals Met:**	1, 2, 6
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project, Natural Systems Protection
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	Within 5 years	**Potential Funding Sources:**	BRIC, HMGP, Township budget
Responsible Organization:	Engineering, Utilities	**Local Planning Mechanisms to be Used in Implementation if any:**	Capital improvements planning
Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Ban hazardous materials in Township	N/A	Not possible
	Develop contract with neighboring towns for water access in event of contamination	N/A	Neighboring town capacity would be unable to meet needs
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Action Worksheet		
Project Name:	Groundwater Quality Protection	
Project Number:	2021-Sparta-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protects water supply
Property Protection	0	
Cost-Effectiveness	0	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	Hazardous Materials
Timeline	0	Within 5 years
Agency Champion	1	Engineering, Utilities
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Backup Power for Sparta Ambulance Service		
Project Number:	2021-Sparta-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. The shelter located within the Sparta Ambulance Service building on Sparta Avenue lacks backup power.		
Action or Project Intended for Implementation			
Description of the Solution:	The Engineer will research what size generator is needed to power the Sparta Ambulance Service building. The Township will then purchase and install the selected generator and necessary electrical components to supply backup power to the Sparta Ambulance Service building.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of Sparta Ambulance Service building
Useful Life:	20 years	**Goals Met:**	1, 3
Estimated Cost:	$50,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Engineer, OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Backup Power for Sparta Ambulance Service	
Project Number:	2021-Sparta-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Sparta Ambulance Service building
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather
Timeline	0	Within 5 years
Agency Champion	1	Engineer, OEM
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Harden DPW Building		
Project Number:	2021-Sparta-004		
Risk / Vulnerability			
Hazard(s) of Concern:	Hurricane, Severe Weather		
Description of the Problem:	The Township would like to use the DPW building located on Prices Lane as a safe room for tornadoes and hurricanes. The Township has already installed a backup generator to support the site.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will work to harden the DPW building using FEMA 361 standards.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	FEMA 361 standards	**Estimated Benefits (losses avoided):**	Safe Room established
Useful Life:	25 years	**Goals Met:**	1, 2, 6
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	3 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, USDA Community Facilities Grant Program, Township budget
Responsible Organization:	OEM, Public Works, Engineer	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, Emergency management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Build new DPW Facility	High	Costly, unnecessary
	Build standalone Safe Room	High	Costly, unnecessary

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Harden DPW Building	
Project Number:	2021-Sparta-004	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Creates safe room
Property Protection	1	Protects DPW from wind damages
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Township has the legal authority to complete the project
Fiscal	0	The project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Hurricane, Severe Weather
Timeline	0	5 years
Agency Champion	1	OEM, Public Works, Engineer
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Harden Germany Flats Pump Facility		
Project Number:	2021-Sparta-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather		
Description of the Problem:	Windows of the Germany Flats pump facility are not impact resistant and pose a threat in the event of a high wind event.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will retrofit impact resistant windows and shutters on Germany Flats Pump Facility located on Park Lake Drive.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	500-year wind event	**Estimated Benefits (losses avoided):**	Reduction in risk of roof failure and protection of critical services
Useful Life:	25 years	**Goals Met:**	2, 6
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	3 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, USDA Community Facilities Grant Program, Township budget
Responsible Organization:	OEM, Public Works	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation, Emergency management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Build new Pump Facility	High	Costly, unnecessary
	Build small pump station in case of failure	High	Costly, facility unlikely to be used

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Harden Germany Flats Pump Facility	
Project Number:	2021-Sparta-005	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protects critical services of Pump Facility
Property Protection	1	Protects Pump Facility from wind damages
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Township has the legal authority to complete the project
Fiscal	0	The project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather
Timeline	0	5 years
Agency Champion	1	OEM, Public Works
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Streambank Stabilization		
Project Number:	2020-Borough of Sussex-006		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Landslide		
Description of the Problem:	Glen Brook and Wallkill River are prone to erosion of streambanks, threatening homes, roadways, and a JCP&L substation (located along the Wallkill River).		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will determine the proper stream stabilization techniques for a 3,500 feet section of Glen Brook and a 1,500 section of the Walkill River at Station Park. Once the techniques are established, the Township will implement stream stabilization and continue to monitor the locations to measure success and needs for additional measures.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Protect from home damage, road damage, JCP&L substation damage
Useful Life:	1 year	**Goals Met:**	1
Estimated Cost:	Medium for Glen Brook, $1M for Wallkill River	**Mitigation Action Type:**	Natural Systems Protection
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, Township budget
Responsible Organization:	Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Retreat from areas near Glen Brook and Wallkill River	High	Costly, unpopular
	Levees along Glen Brook and Wallkill River	High	Not feasible/environmentally damaging, costly

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Streambank Stabilization	
Project Number:	2021-Sparta-006	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Project will protect from home damage, road damage, JCP&L substation from potential flood damage
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	0	Permitting likely required
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Hurricane, Nor'Easter, Severe Weather
Timeline	0	
Agency Champion	1	Administration
Other Community Objectives	1	Restore natural floodplain function
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Culvert at West Mountain Road		
Project Number:	2021-Sparta-008		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	West Mountain Road floods regularly between the High School football field and Main Street.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will replace the culvert at West Mountain Road and elevate the roadway to allow for larger storm events to occur without risk for flooding.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD by size selected	**Estimated Benefits (losses avoided):**	Reduction in flood risk
Useful Life:	30 years	**Goals Met:**	2
Estimated Cost:	$600,000	**Mitigation Action Type:**	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	6 months	**Potential Funding Sources:**	HMGP, BRIC, municipal budget
Responsible Organization:	Engineering	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate roadway but no culvert replacement	$500,000	Culvert failure will eventually cause flooding problems
	Relocate roadway	N/A	Not possible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Replace Culvert at West Mountain Road	
Project Number:	2021-Sparta-008	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protects life from flooding.
Property Protection	1	Protects culvert from flood damage
Cost-Effectiveness	0	
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would reduce flooding impacts
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	Within 5 years
Agency Champion	1	DPW
Other Community Objectives	1	
Total	9	
Priority (High/Med/Low)	High	

9.20 BOROUGH OF STANHOPE

This section presents the jurisdictional annex for the Borough of Stanhope. The annex includes a general overview of the Borough of Stanhope; an assessment of the Borough of Stanhope's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.20.1 Hazard Mitigation Planning Team

The Borough of Stanhope followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.20-1. Hazard Mitigation Planning Team

Primary Point of Contact		Alternate Point of Contact
Name / Title: Brian McNeilly, Borough Administrator Address: 77 Main Street, Stanhope, NJ 07874 Phone Number: (973) 347-0159 x14 Email: bmcneilly@stanhopenj.gov		Name / Title: Eric Keller, Borough Engineer Address: 77 Main Street, Stanhope, NJ 07874 Phone Number: (973) 291-2919 Email: ekeller@bowmanconsulting.com
NFIP Floodplain Administrator		
Name / Title: Thomas Pershouse, Construction Official Address: 77 Main Street, Stanhope, NJ 07874 Phone Number: (973) 347-0159 x20 Email: tminniti@stanhopenj.gov		
Name	**Title**	**Method of Participation**
Brian McNeilly	Administrator	Primary point of contact, lead information gathering, attended the annex training
Wayne Anthony	OEM Coordinator	Provided background on previous submissions and current OEM related info
Eric Keller	Borough Engineer	Alternate point of contact, information resource
Thomas Pershouse	Construction Official	NFIP floodplain administrator

9.20.2 Jurisdiction Profile

The Borough of Stanhope is located at the southern tip of Sussex County. It has a total area of 2.2 square miles and is bordered to the north and west by Byram Townships, to the north and east by Hopatcong Borough and to the south by Morris County. Lake Musconetcong is a large lake located in the southeastern portion of the Borough. Tributaries of the Musconetcong River flow through the Borough.

According to the U.S. Census, the 2010 population for the Borough of Stanhope was 3,610. The estimated 2018 population was 3,411, a 5.5 percent increase from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 4.9 percent of the population is 5 years of age or younger and 8.3 percent is 65

years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.20.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.19-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.20-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	0	0	0	0	0	0	0	0	1	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0	0	0	0	0	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
None identified					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None anticipated					

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.20.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Borough of Stanhope performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and

each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Borough of Stanhope identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Borough of Stanhope and where hazard mitigation has been integrated.

Table 9.20-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *This code follows State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Land Use Department is responsible for this code in compliance with Chapter 100 of Borough Code.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Land Use Department is responsible for this ordinance in compliance with Chapter 100 of Borough Code.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *The Land Use Department is responsible for this ordinance in compliance with Chapter 100 of Borough Code.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	Yes – if municipality has a Planning Board	-	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Land Use Department is responsible for these requirements in compliance with Chapter 100 of Borough Code.*					
Environmental Protection	Yes	State, Federal	No	Yes	-
Comment: • *Chapter 12 Environmental Commission* • *Chapter 90 Hazardous Materials*					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	-
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Construction Official is responsible for this ordinance in compliance with Chapter 100, Article 21 – Flood Damage Prevention.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	Yes	Local	No	No	-
Comment: • *Chapter 15 Fire Department* • *Chapter 37 Police Department*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other: Municipal Separate Storm Sewer System (MS4)	Yes	State	Yes	Yes	-
Comment: *The Land Use Department is responsible for this ordinance in compliance with Chapter 100 of Borough Code.*					
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Yes	Local	No	Yes	-
Comment: *The Zoning Department is responsible for these ordinances in compliance with Chapter 100 of Borough Code.*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Land Use Department is responsible for this plan, which was re-examined in April of 2018. The plan was updated in 2019.*					
Capital Improvement Plan	Yes	Local	No	No	-
Comment:					
Disaster Debris Management Plan	No	-	No	-	2021-Stanhope-003
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	State	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The Boro Engineer is responsible for this plan, which is a part of the Master Plan.*					
Stormwater Pollution Prevention Plan	Yes	State , County	Yes	No	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	Yes	Local, County, State	No	No	-
Comment:					
Transportation Plan	Yes	State, County & Local	No	No	-
Comment:					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other: Open Space Plan	Yes	Local	No	Yes	-
Comment: • *The Land Use Department is responsible for this plan, which was adopted in April of 2009.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The OEM is responsible for this plan.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	Yes	County	No	Yes	-
Comment:					
Other	No	-	No	-	-
Comment:					

Table 9.20-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Building Department
Does your jurisdiction have the ability to track permits by hazard area?	No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Borough of Stanhope.

Table 9.20-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Land Use Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Mayor and Council
Open Space Board / Committee	No	-
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Nixle Text Messaging System
Maintenance program to reduce risk	Yes	Risk Management Consultant
Mutual aid agreements	Yes	Fire Department
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Borough Engineer / Planner
Engineers or professionals trained in building or infrastructure construction practices	Yes	Borough Engineer / Construction Official

Staff/Personnel Resource	Available?	Department/Agency/Position
Planners or engineers with an understanding of natural hazards	Yes	Borough Engineer
Staff with training in benefit/cost analysis	No	Chief Financial Officer
Staff with training in green infrastructure	Yes	Borough Engineer / Planner
Staff with education/knowledge/training in low impact development	Yes	Borough Engineer / Planner
Surveyor	Yes	Borough Engineer's Office
Stormwater engineer	Yes	Borough Engineer
Personnel skilled or trained in GIS applications	Yes	Borough Engineer / Planner
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Emergency Management Coordinator
Watershed planner	No	-
Environmental specialist	No	-
Grant writers	Yes	Millennium Strategies
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Construction Official

Fiscal Capability

The table below summarizes financial resources available to the Borough of Stanhope.

Table 9.20-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	Yes
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	-

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Stanhope.

Table 9.20-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes
Do you have personnel skilled or trained in website development?	Yes

Criterion	Response
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes, Borough website and social media

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Stanhope.

Table 9.20-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	Unknown	Unknown
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Not certified	Joined program on 9/14/2010

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.20-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Weak
Flood	Weak
Geologic	Weak
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Weak

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Nor'Easter	Strong
Severe Weather	Moderate
Severe Winter Weather	Strong
Wildfire	Weak

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

The Borough does not have access to resources to determine the possible impacts of climate change upon the municipality. However, the administration is supportive of integrating climate change in policies or actions.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.20-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Borough Engineer / DPW
Who is your floodplain administrator? (name, department/position)	Thomas Pershouse, Construction Official
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	2006
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements set by FEMA and the State.
When was the most recent Community Assistance Visit or Community Assistance Contact?	Unknown
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	No, but the FPA would attend training if needed.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	3 policies
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	2 claims $16,257
Do you maintain a list of properties that have been damaged by flooding?	No

Criterion	Response
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

Opportunities for Future Integration

- **Disaster Debris Management Plan:** The Borough will develop a Disaster Debris Management Plan. (2021-Stanhope-003)

9.20.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Borough of Stanhope's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.19-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.20-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	No Damages or losses
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	No Damages. Loss revenues and costs associated with PPE

Source: FEMA 2020, NOAA NCEI 2020

9.20.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Borough of Stanhope risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Stanhope that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Stanhope has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Stanhope.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.20-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
None identified			

Source: Sussex County Planning Partnership 2020

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- There is no standby power at Lenape Valley Regional High School at 28 Sparta Road.
- There is no standby power at Stanhope Public School at 24 Valley Road.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Borough of Stanhope ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Borough of Stanhope. The Borough of Stanhope has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Borough of Stanhope agreed with the calculated hazard rankings.

Table 9.20-13. Borough of Stanhope Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	Medium

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
High	High	High	High	High	High	Medium

9.20.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.19-15 and Table 9.19-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.20-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Stanhope-1 (revised old #1)	Ensure continuity of operations at critical facilities and municipal buildings. The following is identified at this time: Purchase and install a backup generators for Lenape Valley Regional High School and Valley Road School	Emergency Management	No Progress	X	2021-Stanhope-001, 2021-Stanhope-002
Stanhope-2 (old #4)	Conduct all-hazards public education and outreach program for hazard mitigation and preparedness.	Borough Administration	Ongoing Capability		
Stanhope-3 (new)	Utilize the Hazard Mitigation Plan (HMP) when updating the Comprehensive Master Plan; consider including hazard identification, hazard zones risk assessment information, and hazard mitigation goals as identified in the HMP. Further, the findings and recommendation of the HMP will be considered during any future site plan review processes.	Planning	Ongoing Capability		

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update? Check if Yes	Include in the 2021 HMP Update? Enter 2021 HMP Action #
Stanhope-4 (new)	Develop specific design guidelines and development review procedures for new construction, replacement, relocation and substantial improvement in hazard areas within the Borough.	Borough Administration	Ongoing Capability		
Stanhope-5 (new)	When updating the Zoning Ordinance, the Borough will recognize hazard areas as limits on changes to zoning within the municipality.	Borough Administration	Ongoing Capability		
Stanhope-6 (new)	Ensure hazard mitigation initiatives are incorporated into the capital improvement plan; budget for some of these projects.	Borough Administration	Ongoing Capability		
Stanhope-7 (new)	Incorporate risk assessment and hazard mitigation initiatives into planning efforts.	Borough Administration	Ongoing Capability		

In addition to the above progress, the Borough of Stanhope identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- None identified

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Stanhope participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Stanhope participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.19-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Stanhope would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.19-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.20-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Stanhope-001	Generator for Lenape Valley Regional High School	**Problem**: Backup power sources are necessary to maintain critical services for critical facilities. There is no standby power at Lenape Valley Regional High School at 28 Sparta Road. **Solution:** The Borough will work with Lenape Valley High School to purchase and install a 75-85 kW generator and necessary electrical components to supply backup power to the School.	Existing	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather	1, 6	Emergency Management, School District	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Ensures continuity of operations of High School	$75,000 - $100,000	Within 5 years	High	SIP	ES
2021-Stanhope-002	Generator for Stanhope School	**Problem**: Backup power sources are necessary to maintain critical services for critical facilities. There is no standby power at Stanhope Public School 24 Valley Road. **Solution:** The Borough will work with the Stanhope School to purchase and install a 35-40 kW generator and necessary electrical components to supply backup power to the School.	Existing	Hurricane, Nor'Easter, Severe Weather, Severe Winter Weather	1, 6	Emergency Management, School District	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Ensures continuity of operations of School	$50,000	Within 5 years	High	SIP	ES
2021-Stanhope-003	Disaster Debris Management Plan	**Problem**: The Borough lacks a Disaster Debris Management Plan. **Solution:** The Borough will develop and adopt a Disaster Debris Management Plan. The Plan will include any necessary mutual aid discussions to supplement the Borough's capabilities. **Solution:**	N/A	All Hazards	5	OEM, Administration	Borough budget	Increased disaster capabilities	Staff time	2 years	High	LPR	ES

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC	*Building Resilient Infrastructure and Communities Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.20-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Stanhope-001	Generator for Lenape Valley Regional High School	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High ⚠
2021-Stanhope-002	Generator for Stanhope School	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2021-Stanhope-003	Disaster Debris Management Plan	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.20-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure					X			X
Disease Outbreak					X			X
Drought					X			X
Earthquake					X			X
Flood					X			X
Geologic					X			X
Hazardous Materials					X			X
Hurricane and Tropical Storm					X			X
Invasive Species					X			X
Nor'Easter					X			X
Severe Weather					X			X
Severe Winter Weather					X			X
Wildfire					X			X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard

ORANGE medium ranked hazard

YELLOW low ranked hazard

Figure 9.20-1. Borough of Stanhope Hazard Area Extent and Location Map 1

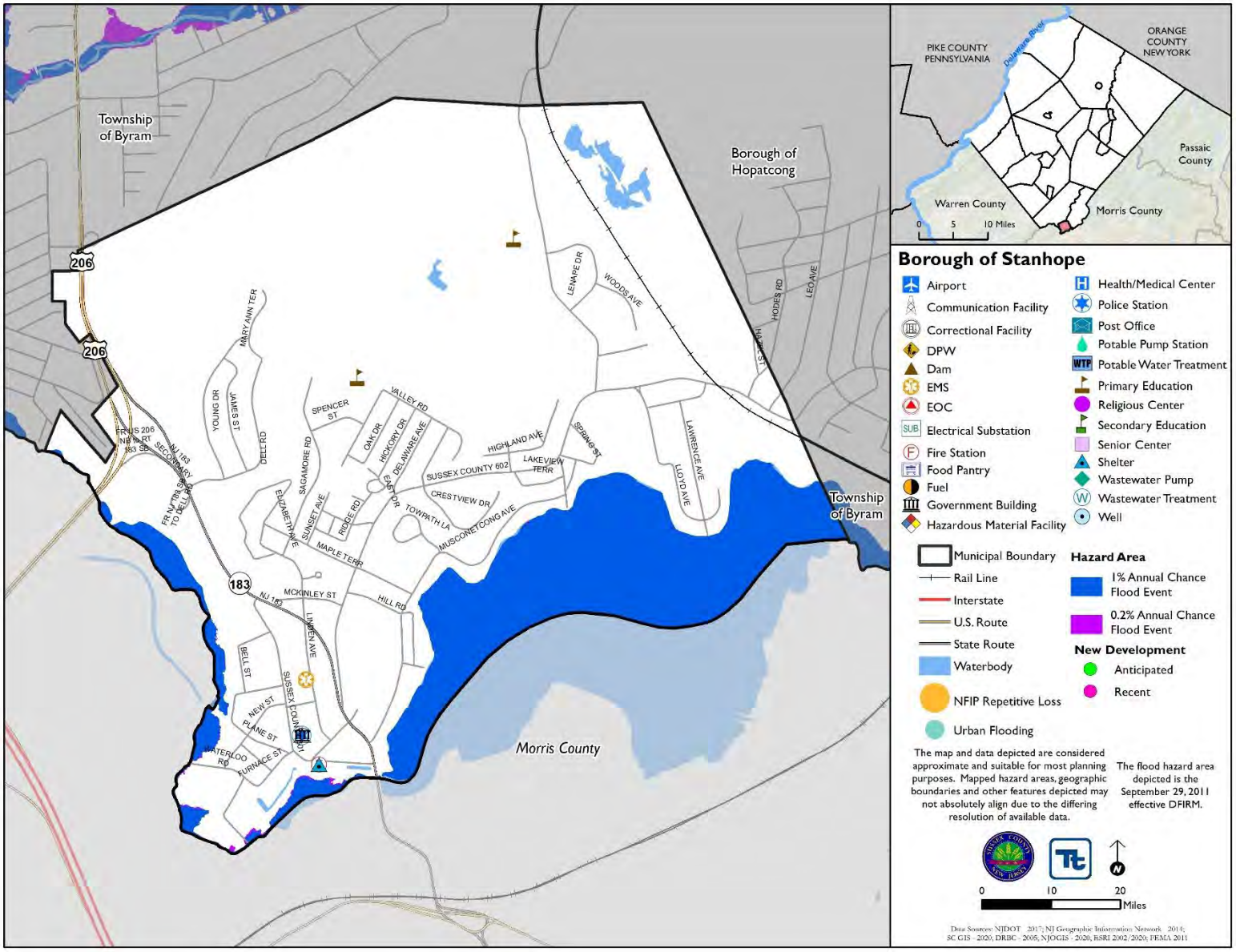


Figure 9.20-2. Borough of Stanhope Hazard Area Extent and Location Map 2

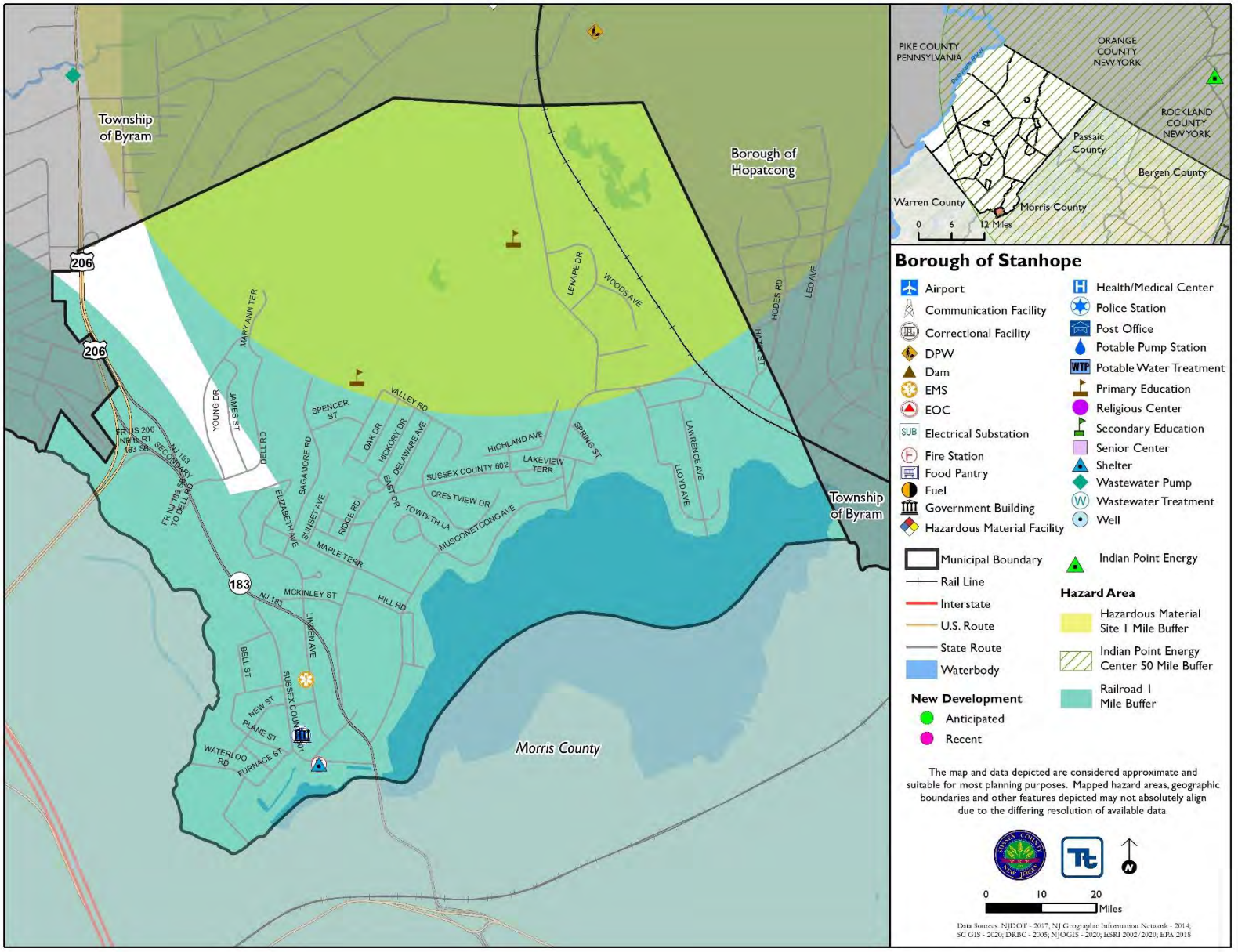
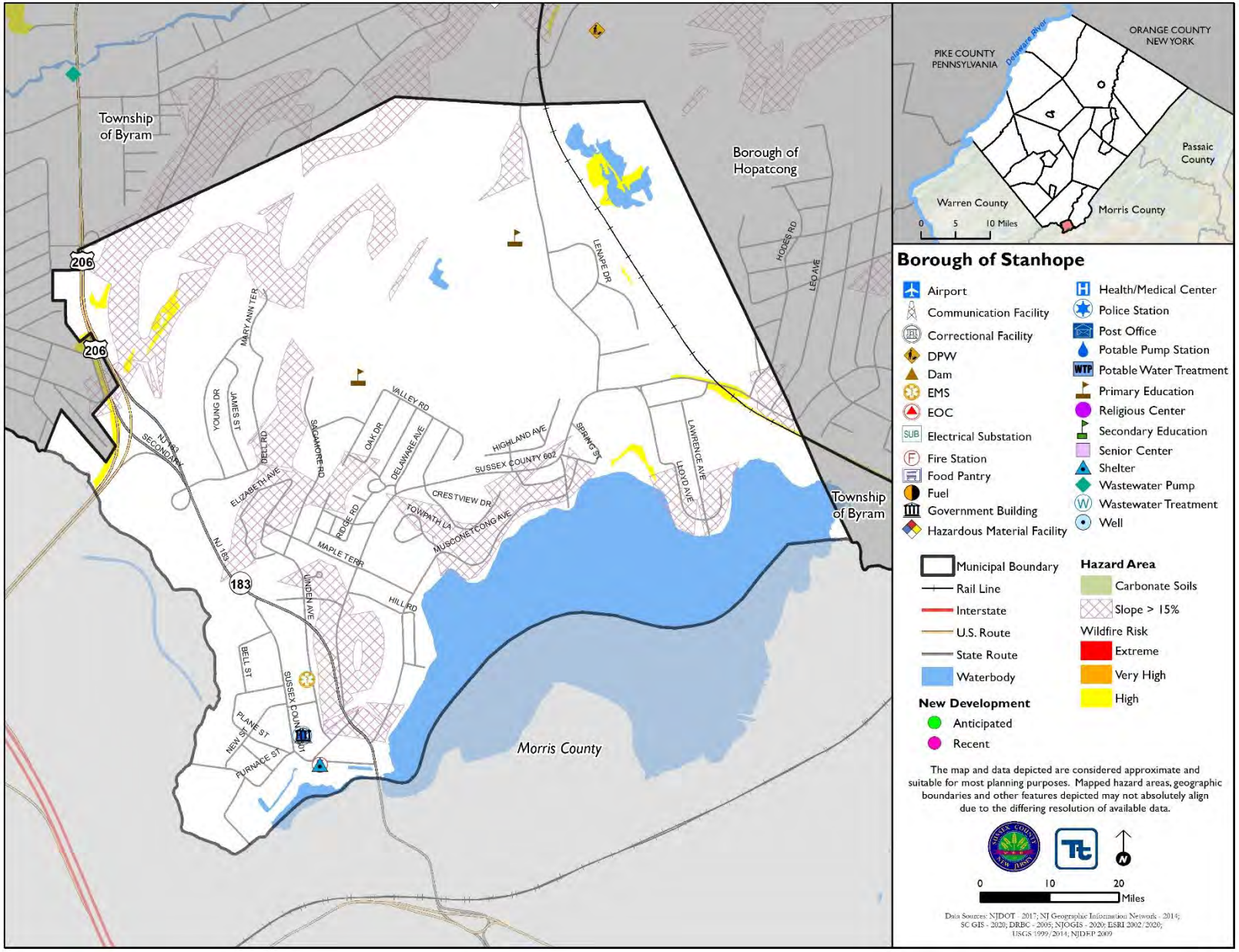


Figure 9.20-3 Borough of Stanhope Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Generator for Lenape Valley Regional High School		
Project Number:	2021-Stanhope-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. There is no standby power at Lenape Valley Regional High School at 28 Sparta Road.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will work with Lenape Valley High School to purchase and install a 75-85 kW generator and necessary electrical components to supply backup power to the School.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	75-85 kW	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of High School
Useful Life:	20 years	**Goals Met:**	1, 6
Estimated Cost:	$75,000 - $100,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Emergency Management, School District	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Generator for Lenape Valley Regional High School	
Project Number:	2021-Stanhope-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Lenape Valley Regional High School
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Emergency Management, School District
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Generator for Stanhope School		
Project Number:	2021-Stanhope-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. There is no standby power at Stanhope Public School 24 Valley Road.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will work with the Stanhope School to purchase and install a 35-40 kW generator and necessary electrical components to supply backup power to the School.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	35-40 kW	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of School
Useful Life:	20 years	**Goals Met:**	1, 6
Estimated Cost:	$50,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Emergency Management, School District	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Generator for Stanhope School	
Project Number:	2021-Stanhope-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Stanhope School
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Emergency Management, School District
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

9.21 TOWNSHIP OF STILLWATER

This section presents the jurisdictional annex for the Township of Stillwater. The annex includes a general overview of the Township of Stillwater; an assessment of the Township of Stillwater's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.21.1 Hazard Mitigation Planning Team

The Township of Stillwater followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.21-1. Hazard Mitigation Planning Team

Primary Point of Contact		Alternate Point of Contact
Name / Title: Lisa Chammings, Mayor/OEM Address: 964 Stillwater Road, Newton, NJ 07860 Phone Number: (973) 903-3003 Email: lchammings@ptd.net		Name / Title: Robert Wolfe, Deputy OEM Address: 964 Stillwater Road, Newton, NJ 07860 Phone Number: (973) 900-1559
NFIP Floodplain Administrator		
Name / Title: Arlene Fisher, Zoning Officer Address: 964 Stillwater Road Newton NJ 0786 Phone Number: (973) 383-9484 Email: zoning@ptd.net		
Name	**Title**	**Method of Participation**
Lisa Chammings	Mayor/OEM	Primary point of contact; attended the kickoff meeting, annex training, risk assessment meeting and mitigation strategy workshop; provided data and information for the annex update; assisted with public outreach by posting an announcement on the Township website.
Robert Wolfe	Deputy OEM	Alternate point of contact
Arlene Fisher	Zoning Officer	NFIP floodplain administrator

9.21.2 Jurisdiction Profile

Stillwater Township is located in southwest Sussex County. It covers an area of 27.1 square miles and is bordered to the north by Sandyston Township, to the east by Frankford and Hampton Townships, to the south by Warren County, and to the west by Warren County and Walpack Township. The following unincorporated communities are located within the Township: Five Points, Swartswood, Paulinskill, Middleville, and Stillwater. There are many streams located throughout the Township and include: Blair Creek and its tributaries, Trout Brook and its tributaries, Swartswood Creek and its tributaries, Troy Brook and its tributaries, and Paulins Kill and its tributaries.

According to the U.S. Census, the 2010 population for the Township of Stillwater was 4099 The estimated 2019 population was 3870, a 5.6 percent decrease from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 30.0 percent of the population is 18 years of age or younger and 11.2 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.21.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.20-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.21-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	3		3		-		-		1	
Multi-Family					-		-			
Other (commercial, mixed-use, etc.)	3		1		-		-		1	

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
None identified					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None anticipated					

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.21.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Stillwater performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Stillwater identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Stillwater and where hazard mitigation has been integrated.

Table 9.21-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Construction Official is responsible for this code in compliance with State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.) and Chapter 240 – Land Development.*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Zoning Officer is responsible for this code in compliance with Chapter 240, Article 11 – Land Development / Zoning.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Zoning Officer is responsible for this ordinance in compliance with Chapter 240, Article 6 – Land Development / Subdivision and Site Plan Review and Approval.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *This ordinance follows §240-89 – Stormwater management.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	Yes – if municipality has a Planning Board	-	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	County & Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.*					
Environmental Protection	Yes	Local	No	No	-
Comment: • *Chapter 253 Littering* • *Chapter 338 Soil Removal* • *Chapter 382 Trees* • *Chapter 400 Water* • *Chapter 467 Water Supply*					
Flood Damage Prevention	Yes	Local	Yes	Yes	2021-Stillwater-003
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *Chapter 202 – Flood Damage Prevention.* • *It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:* o *A. Protect human life and health;* o *B. Minimize expenditure of public money for costly flood control projects;* o *C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* o *D. Minimize prolonged business interruptions;* o *E. Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard;*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
o *F. Help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;* o *G. Ensure that potential buyers are notified that property is in an area of special flood hazard; and* o *H. Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.* • *The Ordinance was last revised in 2020 but does not include the state mandated freeboard requirement.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	Yes	Local	No	Yes	-
Comment: • *Chapter 186 Fire Control* • *Chapter 195 Fire Prevention*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Yes	Local	No	Yes	-
Comment: *These ordinances follows Steep Slopes – Land Use ordinance within Township code.*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Planning Board is responsible for this plan, which was re-examined on November 7, 2012.*					
Capital Improvement Plan	Yes	Local	No	Yes/No	Yes/No
Comment: *The Engineering Department and DPW is responsible for this plan, which is updated annually, most recently in April 2016.*					
Disaster Debris Management Plan	Yes	Local	No	Yes	-
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	Yes	Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13. • *The Engineering Department is responsible for this plan, which was originally done in 2005 and became part of the Master Plan (included in re-examination).*					
Stormwater Pollution Prevention Plan	Yes/No	If yes, who enforces?	Yes	Yes/No	Yes/No
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	Yes	Local	No	Yes	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	Yes	Local	No	Yes	-
Comment:					
Community Forest Management Plan	Yes	Local	No	Yes	-
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	Yes	County	No	Yes	-
Comment: *Sussex County Agricultural board assists in Preserved lands. Tax Assessor by ordinance confirms farmland assessment*					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Other: Open Space Plan	Yes	Local	No	Yes	-
Comment: • *The Planning Board and Environmental Commission are responsible for this plan, which was adopted 2012. The ERI was updated in 2014.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Office of Emergency Management is responsible for this plan, which was adopted in 2014.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	Local and County	No	Yes	-
Comment:					
Post-Disaster Recovery Plan	Yes	Local and County	No	Yes	-
Comment:					
Continuity of Operations Plan	Yes	Local and County	No	Yes	-
Comment:					
Public Health Plan	Yes	County	No	Yes	-
Comment:					
Other	No	-	No	-	-
Comment:					

Table 9.21-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Building Department
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Stillwater.

Table 9.21-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Environmental Commission
Open Space Board / Committee	Yes	???

Staff/Personnel Resource	Available?	Department/Agency/Position
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	???
Maintenance program to reduce risk	Yes	???
Mutual aid agreements	Yes	???
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Professional contract
Engineers or professionals trained in building or infrastructure construction practices	Yes	Professional contract
Planners or engineers with an understanding of natural hazards	Yes	Professional contract
Staff with training in benefit/cost analysis	Yes	CFO
Staff with training in green infrastructure	Yes	???
Staff with education/knowledge/training in low impact development	No	-
Surveyor	No	-
Stormwater engineer	Yes	Township Engineer
Personnel skilled or trained in GIS applications	Yes	Township Engineer
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Chammings
Watershed planner	Yes	???
Environmental specialist	No	-
Grant writers	No	-
Resilience Officer	No	-
Other: Professionals trained in conducting damage assessments	Yes	Engineer

Fiscal Capability

The table below summarizes financial resources available to the Township of Stillwater.

Table 9.21-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	No
Development Impact Fees for Homebuyers or Developers	Yes – COAH fees
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Stillwater.

Table 9.21-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes Under our Emergency Management tab the plan is described in part.
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	Yes Our website and our facebook page are used to reach out to our residents during emergencies as well as during times to help prepare in case needs become present.
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	Yes. We have a CERT team that assists as needed during emergencies as well as during non emergencies to help educate our residents.
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	Yes Again this would be or CERT Team as well as our Public Safety committee.

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Stillwater.

Table 9.21-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	4.4	2009; currently being updated
Public Protection (Fire ISO Protection Class)	Yes	04/4X	July 1, 2014
Storm Ready Certification	No	-	-
Firewise Community Classification	Yes – Lake Plymouth Community Association	N/A	2006
Sustainable Jersey	Yes	Not certified	Joined program on 7/19/2011

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.21-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) – Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Strong
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.21-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Zoning and Construction
Who is your floodplain administrator? (name, department/position)	Arlene Fisher, Zoning Officer
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	???
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements set by FEMA and the State.
When was the most recent Community Assistance Visit or Community Assistance Contact?	January 27, 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	???
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	???
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA does not feel adequately supported or trained to fulfill his responsibilities as the municipal floodplain administrator. The FPA indicated that he would consider

Criterion	Response
	attending continuing education and certification training if offered in the county.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	7 policies
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	5 claims $87,323 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	???

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

Opportunities for Future Integration

- **Flood Damage Prevention Ordinance:** The Township will update the Flood Damage Prevention Ordinance to include the state mandated freeboard requirement. (2021-Stillwater-003)

9.21.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Stillwater's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.20-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.21-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	???
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	The Township was subject to municipal office closures and social distancing and masking requirements.

Source: FEMA 2020, NOAA NCEI 2020

9.21.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Stillwater risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Stillwater that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Stillwater has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Stillwater.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.21-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
21-8 Wintermute's Mill Dam	Dam	X	X
21-19 Paulinskill Lake Dam	Dam	X	X
21-33 County Line Dam	Dam	X	X

Source: Sussex County Planning Partnership 2020
Note:
**Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The Flood Damage Prevention Ordinance requires update to include freeboard.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves

an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Stillwater ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Stillwater. The Township of Stillwater has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Stillwater agreed with the calculated hazard rankings.

Table 9.21-13. Township of Stillwater Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.21.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.20-15 and Table 9.20-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.21-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Stillwater-1 (new)	Ensure continuity of operations at critical facilities. The following location is identified at this time: Stillwater Township Town Hall Generator	Township Committee			
Stillwater-2 (old #8)	Provide information on all types of hazards, preparedness and mitigation measures, and responses through social media and on the Township website.	Township			

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Stillwater-3 (old #7)	Implement Fire Wise Program throughout the Township.	Township			
Stillwater-4 (revised old #6)	Support the mitigation of vulnerable structures via retrofit (e.g. elevation, flood-proofing) or acquisition / relocation to protect structures from future damage. Phase 1: Identify appropriate candidates and determine most cost-effective mitigation option. Phase 2: Work with the property owners to implement selected action based on available funding and local match availability.	Township / Homeowner			

In addition to the above progress, the Township of Stillwater identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- None

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Stillwater participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Stillwater participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.20-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Stillwater would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1)

for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.20-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.21-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Stillwater-001		**Problem**: **Solution:**											
2021-Stillwater-002		**Problem**: **Solution:**											
2021-Stillwater-003	Flood Damage Prevention Ordinance Update	**Problem**: The Township's Flood Damage Prevention Ordinance lacks language to include the state mandated freeboard requirement. **Solution:** The Township will update the Flood Damage Prevention Ordinance to include the state mandated freeboard requirement.	New	Flood	2	Administration	Borough budget	Meet state standards	Staff time	Within 6 months	High	LPR	PR
		Problem: **Solution:**											
		Problem: **Solution:**											
		Problem: **Solution:**											
		Problem: **Solution:**											
		Problem: **Solution:**											
		Problem: **Solution:**											
		Problem: **Solution:**											
		Problem: **Solution:**											
		Problem: **Solution:**											

Notes:

Acronyms and Abbreviations:
CAV Community Assistance Visit
CRS Community Rating System
DPW Department of Public Works

Potential FEMA HMA Funding Sources:
FMA Flood Mitigation Assistance Grant Program
HMGP Hazard Mitigation Grant Program
PDM Pre-Disaster Mitigation Grant Program

Timeline:
The time required for completion of the project upon implementation

Cost:

FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.21-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2021-Stillwater-003	Flood Damage Prevention Ordinance Update	0	1	1	1	1	1	1	1	1	1	0	1	1	1	12	High ⚠

Notes: *Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.*
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.21-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure								
Disease Outbreak								
Drought								
Earthquake	X						X	
Flood								
Geologic								
Hazardous Materials								
Hurricane and Tropical Storm								
Invasive Species								
Nor'Easter								
Severe Weather								
Severe Winter Weather								
Wildfire								

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.21-1. Township of Stillwater Hazard Area Extent and Location Map 1

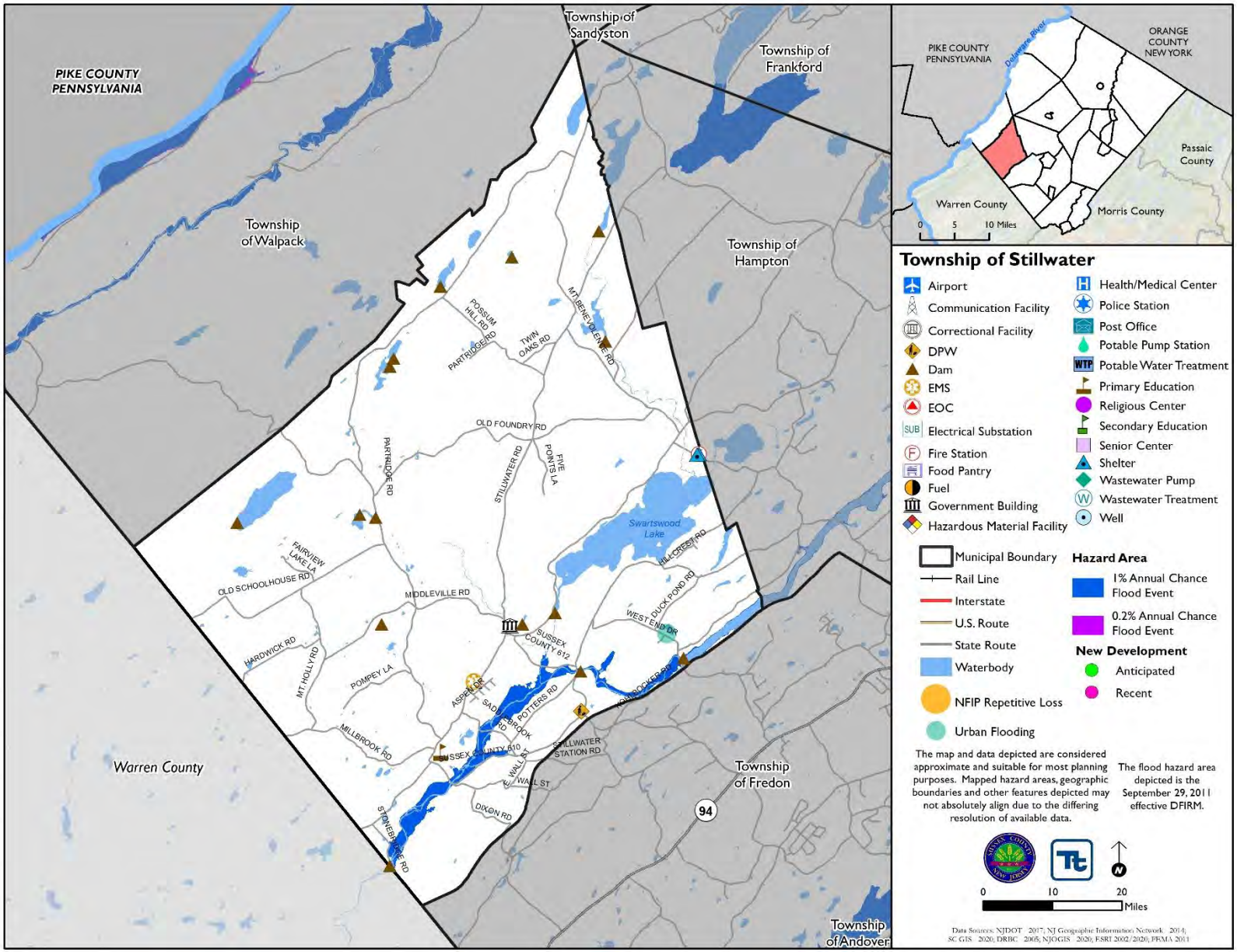


Figure 9.21-2. Township of Stillwater Hazard Area Extent and Location Map 2

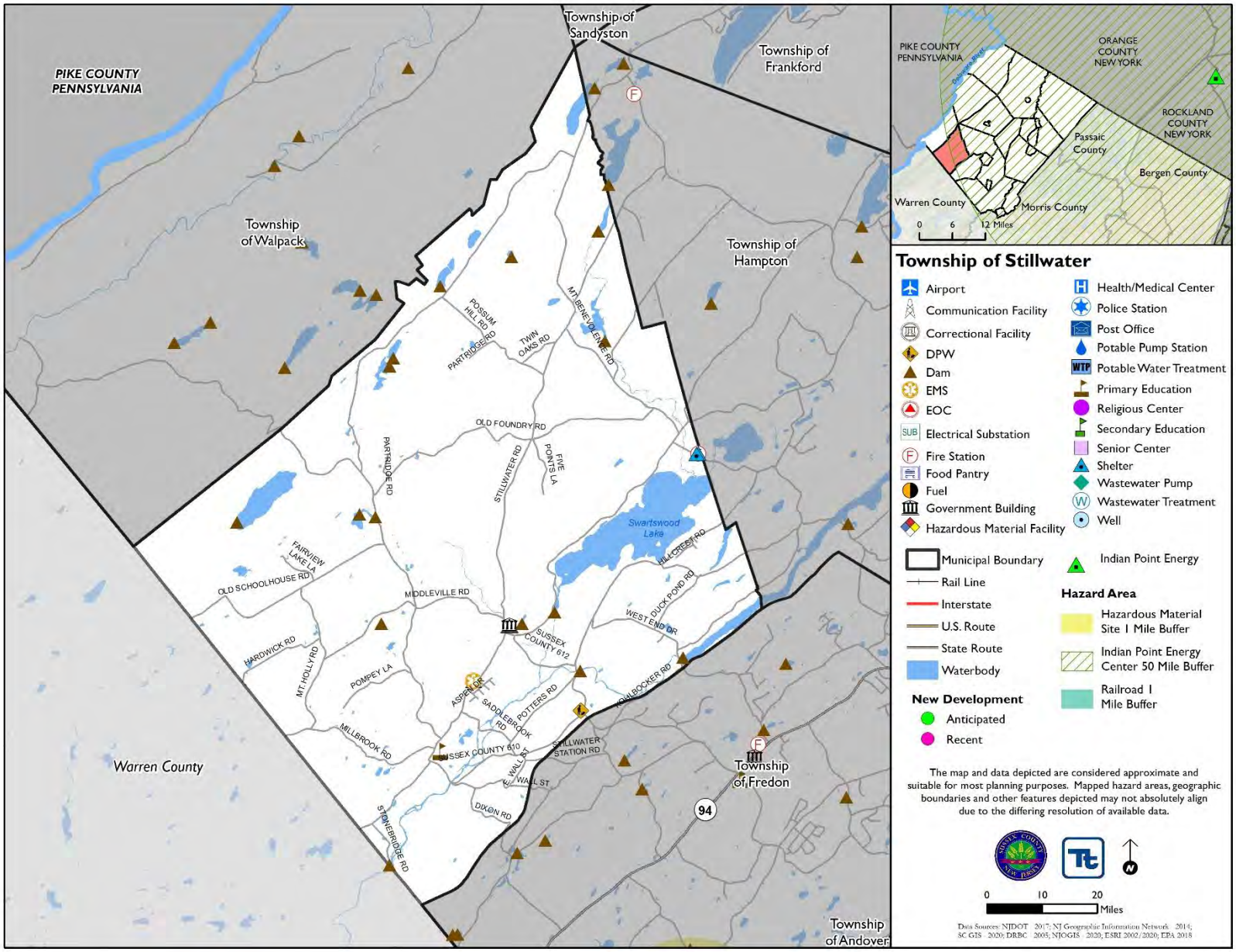
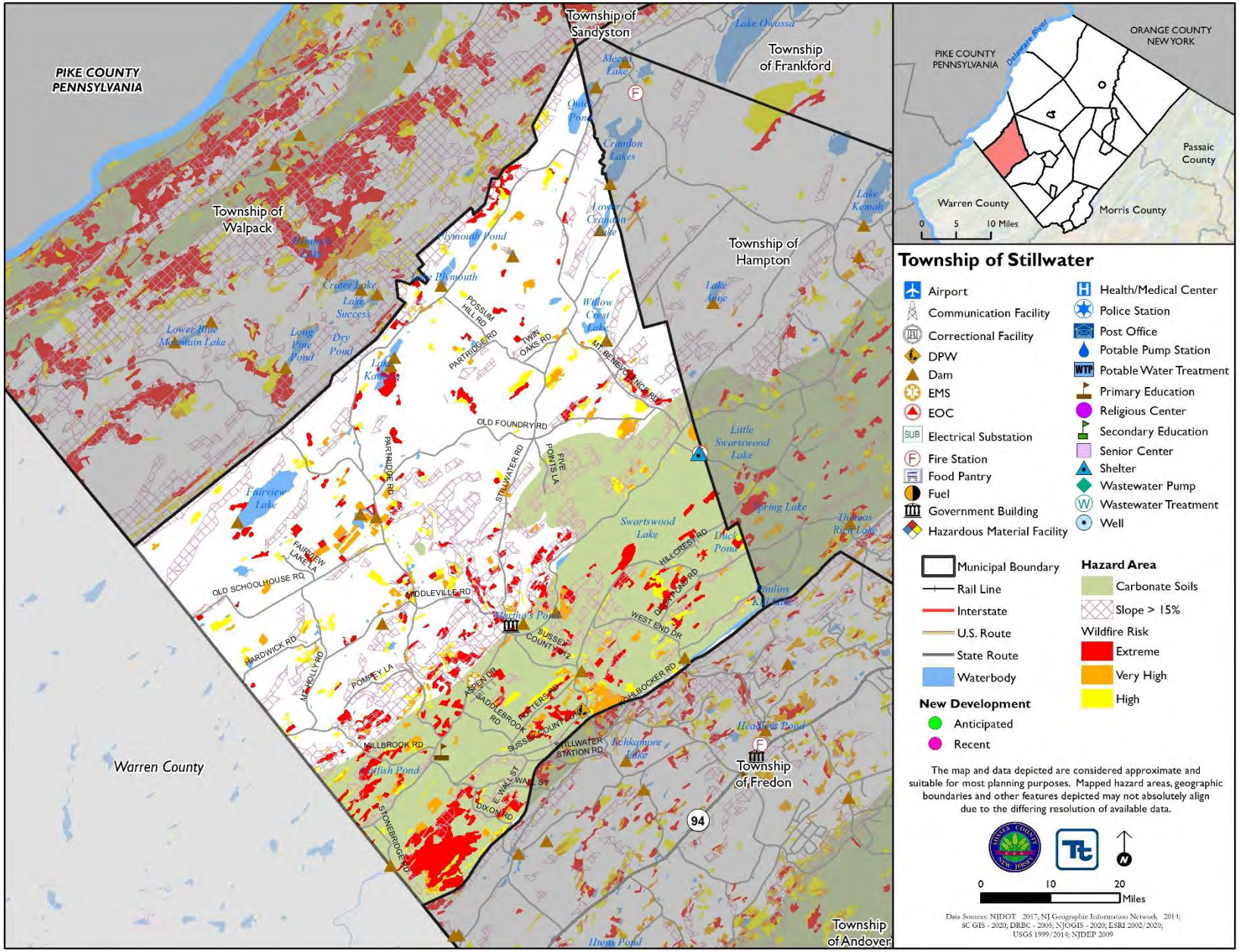


Figure 9.21-3 Township of Stillwater Hazard Area Extent and Location Map 3



9.22 BOROUGH OF SUSSEX

This section presents the jurisdictional annex for the Borough of Sussex. The annex includes a general overview of the Borough of Sussex; an assessment of the Borough of Sussex's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.22.1 Hazard Mitigation Planning Team

The Borough of Sussex followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.22-1. Hazard Mitigation Planning Team

Primary Point of Contact		Alternate Point of Contact
Name / Title: Floyd Southard, OEM Coordinator Address: 2 Main Street, Sussex, NJ 07461 Phone Number: (973) 534-7258 Email: oem@sussexboro.com		Name / Title: Robert Regavich, Deputy OEM Address: 2 Main Street, Sussex, NJ 07461 Phone Number: (973) 271-2047 Email: rregavich@gmail.com
NFIP Floodplain Administrator		
Name / Title: Kevin Kervatt, Zoning Officer Address: 2 Main Street Sussex NJ 07461 Phone Number: (973) 875-4831 Email: zoning@sussexboro.com		
Name	**Title**	**Method of Participation**
Floyd Southard	OEM Coordinator	Primary point of contact, provided data and information, contributed to mitigation strategy; attended kickoff meeting, annex training, risk assessment meeting and mitigation strategy workshop; assisted with public outreach
Robert Regavich	Deputy OEM	Alternate point of contact; attended the kickoff meeting
Kevin Kervatt	Zoning Officer	NFIP floodplain administrator

9.22.2 Jurisdiction Profile

The Borough of Sussex is located in northern Sussex County and is fully surrounded by the Township of Wantage. It has a total area of 0.6 square miles. Clove Brook flows through the Borough.

According to the U.S. Census, the 2010 population for the Borough of Sussex was 2,130 The estimated 2018 population was 1,854, a 12 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 5.7 percent of the population is 5 years of age or younger and 12.6 percent is

65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.22.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.21-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.22-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	1	0	0	0	0	0	0	0	0	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0	0	0	0	0	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
None identified					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Shoprite	Grocery store and supporting business's	1	Block 104 lot 1.01 Block 105 lot 1.03 Block 106 lot 1.02	Nuclear Incident Hazard Area, Wildfire	Approved Beginning site work

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.22.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Borough of Sussex performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- Classification under various community mitigation programs

- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Borough of Sussex identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Borough of Sussex and where hazard mitigation has been integrated.

Table 9.22-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *This code follows State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Zoning Officer is responsible for this code in compliance with Chapter 19, Zoning.* • *The ordinance notes the purpose of securing safety from fire, flood, panic, and other dangers.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The Land Use Board is responsible for this ordinance in compliance with Chapter 18.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *The Engineering Department is responsible for this ordinance.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	Yes	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	Yes – if municipality has a Planning Board	-	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Land Use Board is responsible for these requirements in compliance with Chapter 21.*					
Environmental Protection	Yes	Local	No	Yes	-
Comment: • *The Zoning Officer is responsible for this code in compliance with Chapter 19, Zoning.* • *The ordinance notes the purpose "to promote the establishment of appropriate population densities and concentrations that will contribute to the well being of persons, neighborhood, communities and preservation of the environment"*					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	2020-Borough of Sussex-006
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *This ordinance follows Chapter 22- Flood Hazard Areas. It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:* o *Protect human life and health;* o *Minimize expenditure of public money for costly flood control projects;* o *Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;* o *Minimize prolonged business interruptions;* o *Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, bridges located in areas of special flood hazard;* o *Help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
minimize future flood blight areas; o *Ensure that potential buyers are notified that property is in an area of special flood hazard; and* o *Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.* • *The ordinance currently lacks the state mandated freeboard requirement.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	No	-	No	-	-
Comment:					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other	No	-	No	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen commissioners with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Planner is responsible for this plan, which was adopted on September 21, 2009.*					
Capital Improvement Plan	Yes	Local	No	Yes	-
Comment:					
Disaster Debris Management Plan	No	-	No	-	2020-Borough of Sussex-007
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	No	State & Local	Yes	-	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.					
Stormwater Pollution Prevention Plan	No	-	Yes	-	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other Plans	No	-	No	-	-
Comment:					
Response/Recovery Planning					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	No	2020-Borough of Sussex-008
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *The Office of Emergency Management is responsible for this plan.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	No	-	No	-	-
Comment:					
	No	-	No	-	-
Comment:					

Table 9.22-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	No
Does your jurisdiction have the ability to track permits by hazard area?	No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Borough of Sussex.

Table 9.22-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning & Zoning
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Shade Tree Commission
Open Space Board / Committee	No	-
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	Administrator operates a Nixle alert system
Maintenance program to reduce risk	No	-

Staff/Personnel Resource	Available?	Department/Agency/Position
Mutual aid agreements	Yes	County
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Planner-Ken Nelson, Engineer-Harold Pellow
Engineers or professionals trained in building or infrastructure construction practices	Yes	Planner-Ken Nelson, Engineer-Harold Pellow
Planners or engineers with an understanding of natural hazards	Yes	Planner-Ken Nelson, Engineer-Harold Pellow
Staff with training in benefit/cost analysis	Yes	CFO
Staff with training in green infrastructure	No	-
Staff with education/knowledge/training in low impact development	No	-
Surveyor	No	-
Stormwater engineer	No	-
Personnel skilled or trained in GIS applications	No	-
Local or state water quality professional	No	-
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM
Watershed planner	No	-
Environmental specialist	No	-
Grant writers	Yes	Bruno Associates
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Municipal Zoning Enforcement Officer – Kevin Kervatt
Other: Professionals trained in conducting damage assessments	Yes	Water Sewer Engineer

Fiscal Capability

The table below summarizes financial resources available to the Borough of Sussex.

Table 9.22-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes (Special Assessments)
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other	No

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Borough of Sussex.

Table 9.22-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes – Administrator as part of the Emergency Management Committee
Do you have personnel skilled or trained in website development?	No
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	No

Community Classifications

The table below summarizes the classifications for community programs available to the Borough of Sussex.

Table 9.22-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	Yes	6	2016
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-
Public Education Program/Outreach (through website, social media)	Yes	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.22-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Moderate
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

The Borough does not currently have access to resources to determine the possible impacts of climate change upon the municipality. The Borough is not currently supportive of integrating climate change in policies or actions.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.22-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Zoning
Who is your floodplain administrator? (name, department/position)	Kevin Kervatt/Zoning/Zoning Officer
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements set by FEMA and the State.
When was the most recent Community Assistance Visit or Community Assistance Contact?	July 26, 1990
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA indicated that there are barriers to running an effective floodplain management program due to lack of personnel. The FPA also stated that he does not feel adequately supported or trained to fulfill his role as the municipal floodplain administrator and that he would consider attending continuing education and/or certification training on floodplain management if it was

Criterion	Response
	mandatory.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	4 policies $1,910,000 in coverage $4,325 in premiums
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	4 claims $65,202 in payments
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	Yes

**According to FEMA statistics as of October 13, 2020*
Source: FEMA 2020

9.22.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Borough of Sussex's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.21-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.22-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Weather and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Although the County was impacted, the Borough did not report damages.
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	Ongoing. PPE supplies purchased. Modified hours for the Borough Hall.

Source: FEMA 2020, NOAA NCEI 2020

9.22.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Borough of Sussex risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Borough of Sussex that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the

preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Borough of Sussex has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Borough of Sussex.

- Number of repetitive loss (RL) properties: 1
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities and Critical Facilities

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.22-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
JCP&L	Electrical Substation		X
Clove River Dam	Dam	X	X
DPW Garage/Sewer Department	DPW	X	X

Source: Sussex County Planning Partnership 2020
Note:
**Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The Borough has aging equipment and limited manpower for a long duration winter storm.
- Borough Hall has no backup generator. It was not previously feasible to install until the Borough bought the lot next to the Borough Hall
- Firehouse is used as an EOC which leads to increased usage during a power outage.
- Clove River Dam is a flood risk. The County route and local road run over the Clove Brook which if flooded would take out two bridges that separate the Firehouse from the rest of the town. Flood risk could be reduced through stream bank stabilization surrounding confluence of Clove Brook and Papakating Creek.
- The DPW Garage/Sewer Department is in floodplain of Papakating Creek.
- The Borough has one repetitive loss property.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people,

property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Borough of Sussex ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Borough of Sussex. The Borough of Sussex has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Borough of Sussex agreed with the calculated hazard rankings.

Table 9.22-13. Borough of Sussex Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Low

9.22.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.21-15 and Table 9.21-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.22-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Sussex Boro-1 (old #1)	Stream bank stabilization, rip-wrap instillation surrounding confluence of Clove Brook and Papakating Creek.	DPW Manager	No Progress	X	2020-Borough of Sussex-005
Sussex Boro-2 (old #2)	Stream bank stabilization of town reservoir and feeder waterway to water treatment plant.	DPW Manager	No Progress	X	2020-Borough of Sussex-005
Sussex Boro-	Armoring of Lake Rutherford Dam located in High Point State	DPW Manager	In Progress	X	

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
3 (old #3)	Park.				
Sussex Boro-4 (old #4)	Armoring of Colesville Reservoir Dam located Brink Road	DPW Manager	In Progress	X	
Sussex Boro-5 (old #5)	Retrofit impact resistant windows and shutters on Sussex Fire Department building located on Loomis Avenue.	Station Commander	No Progress		
Sussex Boro-6 (old #6)	Retrofit impact resistant windows and shutters on Sussex Middle School located on Loomis Avenue	School Administration	No Progress		
Sussex Boro-7 (old #7)	Retrofit roof to meet current standards for snow load on original section of Sussex middle School located on Loomis Avenue.	School Administration	No Progress		
Sussex Boro-8 (old #8-10)	Ensure continuity of operations at critical facilities. The following were identified at this time: 1. Backup generator for shelter at Sussex Christian School located on Unionville Avenue 2. Backup generator for shelter at Emergency Operations Center located on Main Street. 3. Backup generator for shelter at Department of Public Works garage located on Brookside Avenue.	OEM Coordinator	In Progress; pursue generator for EOC and Borough Hall	X	2020-Borough of Sussex-001
Sussex Boro-9 (old #11)	Implement Fire Wise Program throughout the Borough.	OEM Coordinator	No Progress		
Sussex Boro-10 (old #12)	Flood-proofing of the Sussex Boro Fire Company building.	Municipal Fire Chief	No Progress		
Sussex Boro-11 (old #13)	Conduct all-hazards public education and outreach program for hazard mitigation and preparedness.	OEM Coordinator	Ongoing Capability		
Sussex	Raise sewer pumps	DPW	No Progress	X	2020-Borough

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Boro-12 (new)					of Sussex-003
Sussex Boro-13 (new)	Sewer pumps and DPW garage floor	DPW Manager	No Progress	X	2020-Borough of Sussex-003

In addition to the above progress, the Borough of Sussex identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- None identified

Proposed Hazard Mitigation Initiatives for the Plan Update

The Borough of Sussex participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of Sussex participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.21-15 summarizes the comprehensive-range of specific mitigation initiatives the Borough of Sussex would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.21-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.22-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Borough of Sussex-001	Backup Generator for Critical Facilities	**Problem**: Backup power sources are necessary to maintain critical services for critical facilities. Borough Hall has no backup generator. It was not previously feasible to install until the Borough bought the lot next to the Borough Hall. In addition, the Firehouse is used as an Emergency Operations Center which leads to increased usage during a power outage. **Solution:** The Borough Engineer will research what size generator is needed to power the Borough Hall. The Borough will then purchase and install the selected generator and necessary electrical components to supply backup power to the Borough Hall. The Engineer will also review the generator in place at the Fire House to ensure that it has the capacity to support its use as an Emergency Operations Center. If the generator is lacking the capacity needed, the Borough will replace the generator with the correct sized generator. Public Works will be responsible for maintenance of generators.	Existing	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter	1, 2, 3, 6	Engineer, Public Works	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Ensures continuity of operations of critical facilities	$50,000	Within 5 years	High	SIP	ES
2020-Borough of Sussex-002	Repetitive Loss Mitigation	**Problem**: The Borough has one repetitive loss property. There may be additional properties with high flood risk. These properties require mitigation to prevent future losses and prevent loss of life and property damage. **Solution:** The Borough will conduct outreach to the RL property owner and property owners that have high flood risk and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to	Existing	Flood, Severe Weather	1, 2	NFIP Floodplain Administrator, supported by homeowners	FEMA HMGP and FMA, BRIC, local cost share by residents	Eliminates flood damage to homes and residents, creates open space for the munici	$200,000	3 years	High	SIP	PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone areas that experience frequent flooding (high risk areas).						pality increasing flood storage.					
2020-Borough of Sussex-003	Raised Sewer Pumps at DPW	**Problem**: The DPW Garage/Sewer Department is in floodplain of Papakating Creek. Flooding is a concern. **Solution:** The Borough will install and raise larger replacement sewer pumps along with an applicable sized backup generator and necessary electrical components.	Existing	Flood, Severe Weather	2, 6	Public Works	HMGP, BRIC, Borough budget	Reduction in flooding damages, continuity of operations	High	Within 5 years	High	SIP	PP
2020-Borough of Sussex-004	Increase Winter Storm Capabilities	**Problem**: The Borough has aging equipment and limited manpower for a long duration winter storm. **Solution:** The Borough will work to secure funding for aging equipment and replace as necessary. The Borough will also explore shared services with other municipalities/county/state DPWs and establish agreements with private contractors for long duration storms.	N/A	Severe Winter Weather	5, 6	Administration, DPW	Municipal budget	Increased winter storm capabilities	Low	Within 2 years	High	LPR	ES
2020-Borough of Sussex-005	Streambank Stabilization	**Problem**: Clove River Dam is a flood risk. The County route and local road run over the Clove Brook which if flooded would take out two bridges that separate the Firehouse from the rest of the town. **Solution:** The Borough will aim to reduce flood risk through stream bank stabilization surrounding confluence of Clove Brook and Papakating Creek.	N/A	Dam Failure, Flood, Severe Weather	2, 7	Administration	HMGP, BRIC, Borough budget	Reduction in flood risk	$75,000	Within 5 years	High	NSP	NR
2020-Borough of Sussex-006	Flood Damage Prevention Ordinance	**Problem:** The Borough's Flood Damage Prevention Ordinance lacks the state mandated freeboard requirement. **Solution:** The Borough will adopt an updated version of the Flood Damage Prevention Ordinance which includes the state mandated freeboard requirement.	New and Existing	Flood	2	FPA, Administration	Borough budget	Meeting of state standards	Staff time	1 year	High	LPR	PR
2020-	Disaster Debris	**Problem:** The Borough lacks a Disaster	Existing.	All	2, 3,	OEM, DPW	Borough	Increas	Staff	1	Hig	LPR	ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
Borough of Sussex-007	Management Plan	Debris Management Plan. **Solution:** The Borough will develop and adopt a Disaster Debris Management Plan.		Hazards	5, 6		budget	ed emergency capabilities	time	year	h		
2020-Borough of Sussex-008	Update Emergency Operations Plan to Include Mitigation Integration	**Problem:** The Borough's Emergency Operations Plan is due for update. The plan currently lacks information on hazard mitigation integration. **Solution:** The Borough will update the Emergency Operations Plan and increase the integration of hazard mitigation concepts and information derived from the HMP.	Existing	All Hazards	1, 2, 3, 4, 5, 6	OEM	Borough budget	Increased hazard mitigation integration and emergency capabilities	Staff time	Within 1 year	High	LPR	ES
2020-Borough of Sussex-009	Dam Armoring	**Problem:** Lake Rutherford Dam (located in High Point State Park) and Colesville Reservoir Dam (located on Brink Road) require upgrades to reduce the change of dam failure. The areas the dams are located in have experienced flooding in the past, heightening the chance of dam failure. **Solution:** The DPW manager will complete in progress efforts to armor Lake Rutherford Dam and Colesville Reservoir Dam.	Existing.	Dam Failure, Flood, Severe Weather	2, 7	DPW	HMGP, BRIC, FMA, High Hazard Potential Dam (HHPD) Grant, Borough budget	Address long term risk of dam failure	High	2 years	High	SIP	PP, SP

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC	*Building Resilient Infrastructure and Communities Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*

- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.22-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2020-Borough of Sussex-001	Backup Generator for Critical Facilities	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High ⚠
2020-Borough of Sussex-002	Repetitive Loss Mitigation	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-Borough of Sussex-003	Raised Sewer Pumps at DPW	0	1	1	1	1	1	0	1	1	1	1	0	1	1	11	High
2020-Borough of Sussex-004	Increase Winter Storm Capabilities	1	1	1	1	1	1	1	1	1	1	1	0	1	1	13	High
2020-Borough of Sussex-005	Streambank Stabilization	0	1	1	1	1	0	0	1	1	1	1	0	1	1	10	High
2020-Borough of Sussex-006	Flood Damage Prevention Ordinance	0	1	1	1	1	1	1	1	1	1	0	1	1	1	12	High
2020-Borough of Sussex-007	Disaster Debris Management Plan	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	High
2020-Borough of Sussex-008	Update Emergency Operations Plan to Include Mitigation Integration	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	High
2020-Borough of Sussex-009	Dam Armoring	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High

Notes: *Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-4), Medium (5-8), High (9-14).*

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.22-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure		X		X	X	X	X	X
Disease Outbreak					X			X
Drought					X			X
Earthquake					X			X
Flood	X	X		X	X			X
Geologic					X			X
Hazardous Materials					X			X
Hurricane and Tropical Storm					X			X
Invasive Species					X			X
Nor'Easter					X			X
Severe Weather		X		X	X	X		X
Severe Winter Weather					X			X
Wildfire					X			X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.22-1. Borough of Sussex Hazard Area Extent and Location Map 1

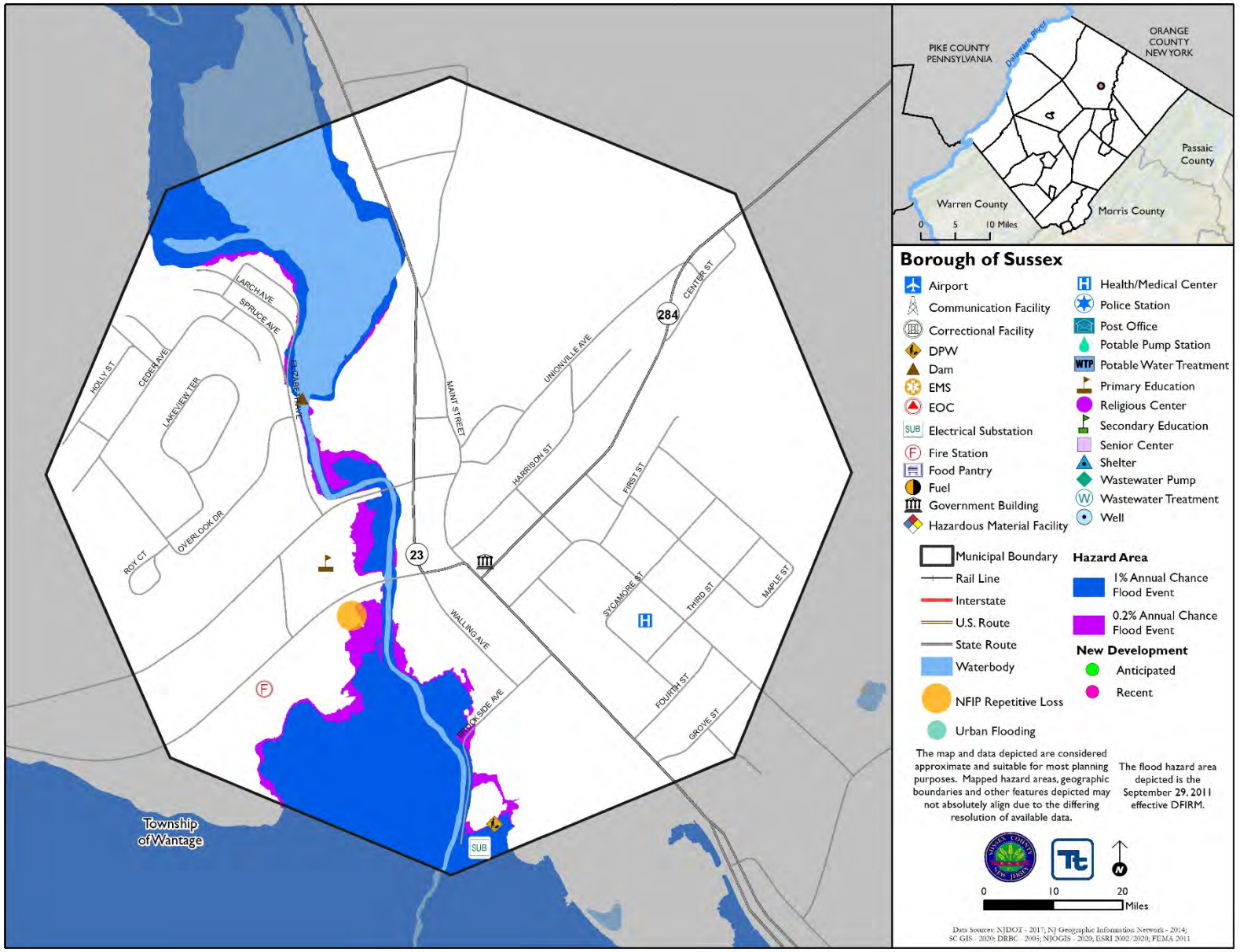


Figure 9.22-2. Borough of Sussex Hazard Area Extent and Location Map 2

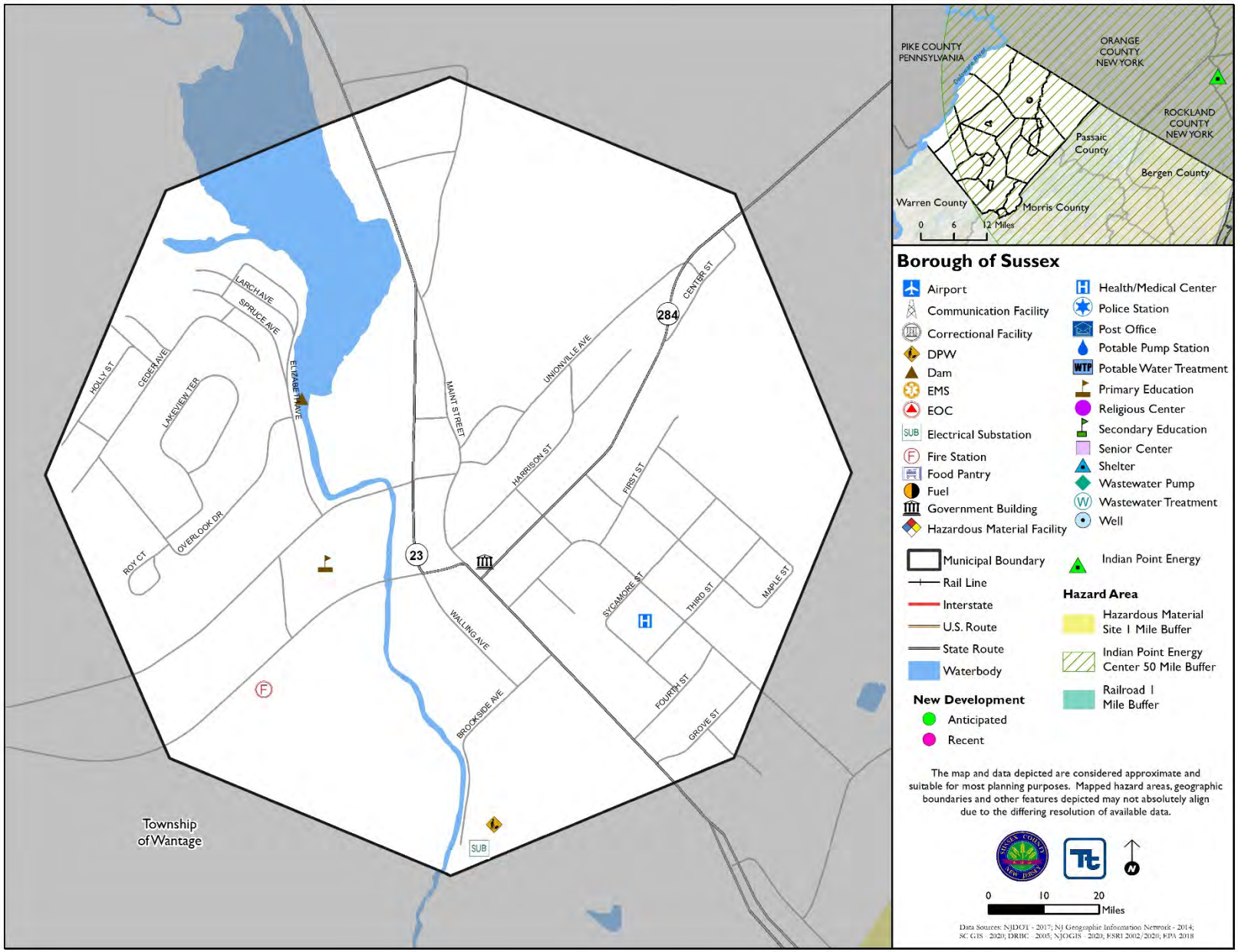
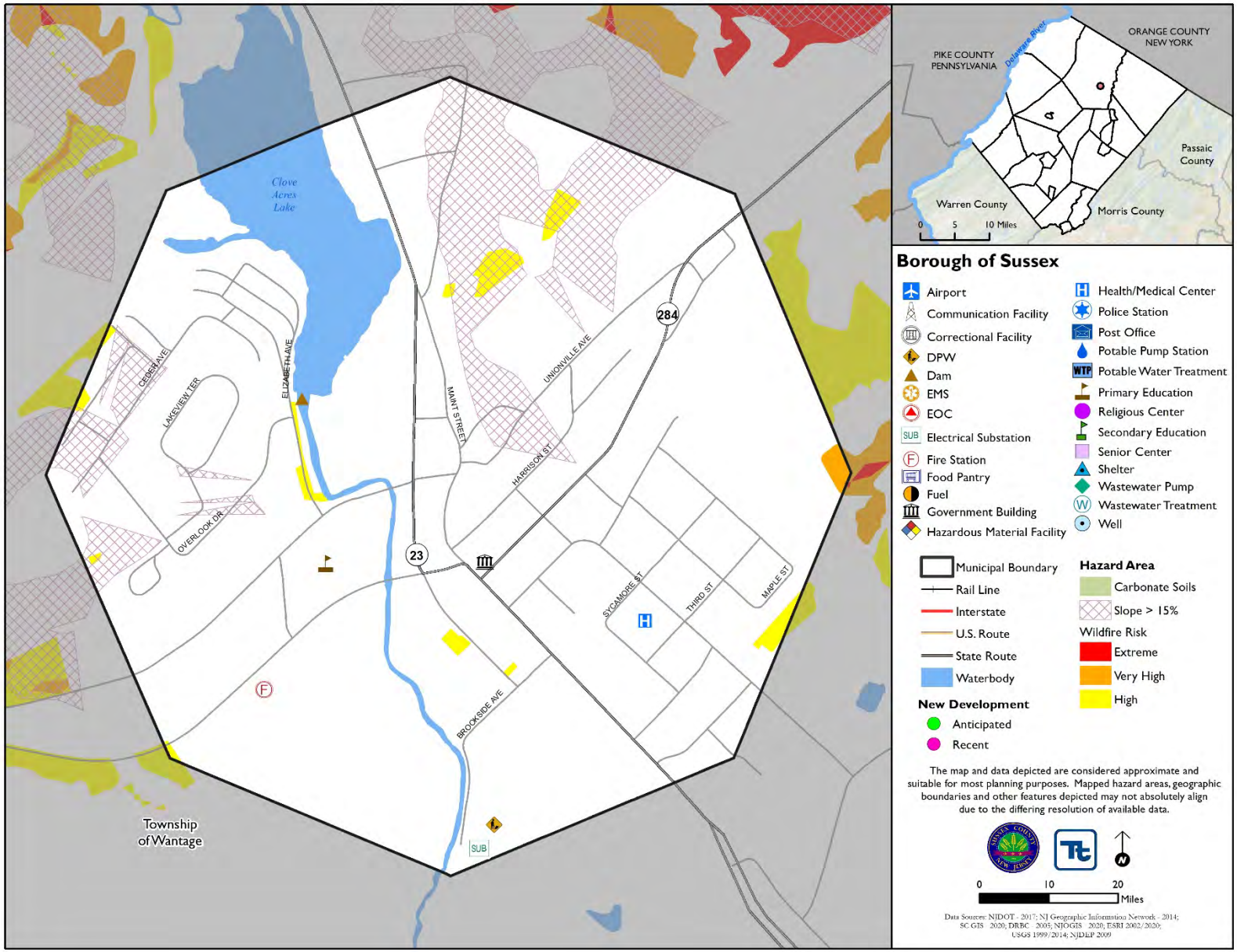


Figure 9.22-3 Borough of Sussex Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Backup Generator for Critical Facilities		
Project Number:	2020-Borough of Sussex-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. Borough Hall has no backup generator. It was not previously feasible to install until the Borough bought the lot next to the Borough Hall. In addition, the Firehouse is used as an Emergency Operations Center which leads to increased usage during a power outage.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough Engineer will research what size generator is needed to power the Borough Hall. The Borough will then purchase and install the selected generator and necessary electrical components to supply backup power to the Borough Hall. The Engineer will also review the generator in place at the Fire House to ensure that it has the capacity to support its use as an Emergency Operations Center. If the generator is lacking the capacity needed, the Borough will replace the generator with the correct sized generator. Public Works will be responsible for maintenance of generators.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of critical facilities
Useful Life:	20 years	**Goals Met:**	1, 2, 3, 6
Estimated Cost:	$50,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Engineer, Public Works	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Backup Generator for Critical Facilities	
Project Number:	2020-Borough of Sussex-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Borough Hall and Fire House
Property Protection	1	Project will protect buildings from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Borough has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Weather, Severe Winter Weather, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Engineer, Public Works
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Repetitive Loss Mitigation		
Project Number:	2020-Borough of Sussex-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather, Hurricane, Nor'easter, Climate Change and Sea Level Rise		
Description of the Problem:	The Borough has one repetitive loss property. There may be additional properties with high flood risk. These properties require mitigation to prevent future losses and prevent loss of life and property damage.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will conduct outreach to the RL property owner and property owners that have high flood risk and provide information on mitigation alternatives. After preferred mitigation measures are identified, collect required property-owner information and develop a FEMA grant application and BCA to obtain funding to implement acquisition/purchase/moving/elevating residential homes in the flood prone areas that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	1% annual chance flood event + freeboard *(in accordance with flood ordinance)*	**Estimated Benefits (losses avoided):**	Eliminates flood damage to homes and residents, creates open space for the municipality increasing flood storage.
Useful Life:	Acquisition: Lifetime Elevation: 30 years (residential)	**Goals Met:**	1, 2
Estimated Cost:	$200,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	6-12 months
Estimated Time Required for Project Implementation:	Three years	**Potential Funding Sources:**	FEMA HMGP and FMA, BRIC, local cost share by residents
Responsible Organization:	NFIP Floodplain Administrator, supported by homeowners	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate homes	$200,000	When this area floods, the entire area is impacted; elevating homes would not eliminate the problem and still lead to road closures and impassable roads
	Elevate roads	$200,000	Elevated roadways would not protect the homes from flood damages

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Repetitive Loss Mitigation	
Project Number:	2020-Borough of Sussex-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Families moved out of high-risk flood areas.
Property Protection	1	Properties removed from high-risk flood areas.
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Borough has the legal authority to conduct the project.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	0	Project would remove families from the flood prone areas of the Borough.
Administrative	0	
Multi-Hazard	1	Flood, Severe Weather, Hurricane, Nor'easter, Climate Change and Sea Level Rise, Severe Weather
Timeline	0	
Agency Champion	1	NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Raised Sewer Pumps at DPW		
Project Number:	2020-Borough of Sussex-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Weather		
Description of the Problem:	The DPW Garage/Sewer Department is in floodplain of Papakating Creek. Flooding is a concern.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will install and raise larger replacement sewer pumps along with an appropriately sized backup generator and necessary electrical components. The pumps will be protected to the 500-year flood level.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	500-year flood level	**Estimated Benefits (losses avoided):**	Reduction in flooding damages, continuity of operations
Useful Life:	50 years	**Goals Met:**	2, 6
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, Borough budget
Responsible Organization:	Public Works	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation
Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Raise roadways in the area	$250,000	Flooding likely to impact property owners
	Elevate homes in the area	$3 million	Costly and roadways still flood
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			
Update Evaluation of the Problem and/or Solution:			

Evaluation and Prioritization		
Project Name:	Raised Sewer Pumps at DPW	
Project Number:	2020-Borough of Sussex-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Project will protect sewer pumps from flooding
Cost-Effectiveness	1	
Technical	1	The project is technically feasible
Political	1	
Legal	1	The Borough is legally able to complete the project
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Severe Weather
Timeline	0	Within 5 years
Agency Champion	1	Public Works
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Streambank Stabilization		
Project Number:	2020-Borough of Sussex-005		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Landslide		
Description of the Problem:	Clove River Dam is a flood risk. The County route and local road run over the Clove Brook which if flooded would take out two bridges that separate the Firehouse from the rest of the town.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will aim to reduce flood risk through stream bank stabilization surrounding confluence of Clove Brook and Papakating Creek.		
Is this project related to a Critical Facility?	Yes ☐	No ☒	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Landslide and flood risk reduced
Useful Life:	1 year	**Goals Met:**	2, 7
Estimated Cost:	$75,000	**Mitigation Action Type:**	Natural Systems Protection
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	HMGP, BRIC, Borough budget
Responsible Organization:	Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Retreat from areas near stream	High	Costly, unpopular
	Levees along stream	High	Not feasible/environmentally damaging, costly

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Streambank Stabilization	
Project Number:	2020-Borough of Sussex-005	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	0	
Property Protection	1	Project will protect properties from potential flood damage
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	0	Permitting likely required
Fiscal	0	Project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Dam Failure, Flood, Severe Weather
Timeline	0	
Agency Champion	1	Administration
Other Community Objectives	1	Restore natural floodplain function
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Dam Armoring		
Project Number:	2020-Borough of Sussex-009		
Risk / Vulnerability			
Hazard(s) of Concern:	Dam Failure, Flood, Severe Weather		
Description of the Problem:	Lake Rutherford Dam (located in High Point State Park) and Colesville Reservoir Dam (located on Brink Road) require upgrades to reduce the change of dam failure. The areas the dams are located in have experienced flooding in the past, heightening the chance of dam failure.		
Action or Project Intended for Implementation			
Description of the Solution:	The DPW manager will complete in progress efforts to armor Lake Rutherford Dam and Colesville Reservoir Dam.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	500-year flood	**Estimated Benefits (losses avoided):**	Address long term risk of dam failure
Useful Life:	50 years	**Goals Met:**	2, 7
Estimated Cost:	High	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	2 years
Estimated Time Required for Project Implementation:	2 years	**Potential Funding Sources:**	HMGP, BRIC, FMA, High Hazard Potential Dam (HHPD) Grant, Borough budget
Responsible Organization:	DPW	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation Planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Buyout properties downstream	High	High cost, high social impacts
	Remove Dam	High	Dams cannot be removed for safety reasons and water supply

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Dam Armoring	
Project Number:	2020-Borough of Sussex-009	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project protects life from dam failure
Property Protection	1	Project protects property from dam failure
Cost-Effectiveness	1	
Technical	1	
Political	1	There is public support for the project
Legal	1	The Borough has the legal authority to complete the project
Fiscal	0	The project requires funding support
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Dam Failure, Flood
Timeline	1	1
Agency Champion	1	DPW
Other Community Objectives	1	
Total	13	
Priority (High/Med/Low)	High	

9.23 TOWNSHIP OF VERNON

This section presents the jurisdictional annex for the Township of Vernon. The annex includes a general overview of the Township of Vernon; an assessment of the Township of Vernon's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.23.1 Hazard Mitigation Planning Team

The Township of Vernon followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.23-1. Hazard Mitigation Planning Team

Primary Point of Contact		Alternate Point of Contact
Name / Title: Ken Clark, OEM Coordinator Address: 21 Church Street, Vernon, NJ 07462 Phone Number: (973) 600-7612 Email: kenclark213@gmail.com		Name / Title: Dan Young, Deputy OEM Coordinator/Police Chief Address: 21 Church Street, Vernon, NJ 07462 Phone Number: 973-764-6155 Email: dyoung43@vernonpolice.com
NFIP Floodplain Administrator		
Name / Title: Robert Westenberger, Construction Official Address: 21 Church Street Vernon NJ 07462 Phone Number: (973) 764-4055 Email: rwestenberger@vernontwp.com		
Name	**Title**	**Method of Participation**
Ken Clark	OEM Coordinator	Provided data and information for the annex update; contributed to the mitigation strategy; attended the kickoff meeting, annex training, risk assessment meeting and mitigation strategy workshop
Dan Young	Dep OEM Coordinator PD Chief	Attended the annex training, risk assessment meeting and mitigation strategy workshop

9.23.2 Jurisdiction Profile

Vernon Township is located in the northeast corner of Sussex County. It has a total area of 70.6 square miles. The Township is most populous municipalities and has the largest area in the county. It is bordered to the north by New York State, to the south by Hardyston Township, to the east by Passaic County, and to the west by Wantage Township. The following unincorporated communities are located within the Township: Owens, Willow Brook, Wantage, Independence Corner, McAfee, Sand Hills, Glenwood, Vernon Valley, DeKays, Highlands Lakes, Kampe, Cherry Ridge, and Wawayanda. There are many ponds and streams located throughout the Township and include, but not limited to: Highland Lake, Wawayanda Lake, Lake Wildwood,

Double Kill, Wawayanda Creek, Pochuck Creek and its tributaries, Black Creek and its tributaries, and the Wallkill River.

According to the U.S. Census, the 2010 population for the Township of Vernon was 23,943. The estimated 2019 population was 21,989, an 8.16 percent decrease from the 2010 Census. Data from the 2019 U.S. Census American Community Survey indicate that 4.4 percent of the population is 5 years of age or younger and 13.7 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.23.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.22-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.23-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	7	0	5	0	7	0	8	0	3	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	1	0	0	0	0	0	0	0	0	0
Property or Development Name	**Type of Development**		**# of Units / Structures**		**Location** (address and/or block and lot)		**Known Hazard Zone(s)***		**Description / Status of Development**	
Recent Major Development and Infrastructure from 2015 to Present										
No major developments constructed.										
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years										
No major developments anticipated.										

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.23.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Vernon performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance

- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Vernon identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Vernon and where hazard mitigation has been integrated.

Table 9.23-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	No	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Construction Department is responsible for this code in compliance with State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.).*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *The Land Use Department and Engineering Department are responsible for this code in compliance with Code Chapter 330.*					
Subdivisions	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The*					
Stormwater Management	Yes	Local	Yes	No	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *This ordinance follows Code Chapter 330-Article XII.*					
Post-Disaster Recovery	No	Local	No	No	-
Comment:					
Real Estate Disclosure	No	State, Division of Consumer Affairs	Yes	No	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	N/A	Yes – if municipality has a Planning Board	No	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.* • *The Land Use Department and Engineering Department are responsible for these requirements in compliance with Code Chapter 333-Article VI.*					
Environmental Protection	Yes	Regional/Local	No	No	-
Comment: *Vernon Township is located in both the Highlands Preservation and Planning Areas. The Township's master planning and zoning ordinances reflect initiatives to protect water resources, preserve land, and promote compatible uses.*					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	No	2021-Vernon-004
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Construction Official is responsible for this ordinance in compliance with Code Chapter 275.*					
Wellhead Protection	Yes	State/Local	No	No	-
Comment: *Vernon Township has several well head protection areas. The identification of wellhead protection areas are required as part of permit applications in the Highlands Preservation Area*					
Emergency Management	Yes	State & Local	No	No	-
Comment: *A Comprehensive Emergency Management Plan was last updated in January 2020.*					
Climate Change	No	Local	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Disaster Recovery Ordinance	No	Local	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	Local	No	-	-
Comment:					
Other: NFIP Freeboard	Yes	State & Local	No	No	2021-Vernon-004
Comment: •					
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	No	Local	No	-	-
Comment: *The Land Use Department and Engineering Department are responsible for these ordinances in compliance with Code Chapter 330-Article XII and slopes, environmental sensitive areas, etc..*					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	-	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.* • *The Land Use Department and Engineering Department are responsible for this plan in compliance with the 2010 Master Plan Update.*					
Capital Improvement Plan	Yes	Local	No	-	-
Comment: *The Administrator is responsible for this plan.*					
Disaster Debris Management Plan	Yes	State & Local	No	-	-
Comment: December 2020- adopted					
Floodplain or Watershed Plan	Yes	County & Local	No	No	-
Comment: *The Engineering Department is responsible for this plan in compliance with Code Chapter 275-3.4.*					
Stormwater Management Plan	Yes	Local	Yes	-	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *The Land Use Department and Engineering Department are responsible for this plan in compliance with Code Chapter 330-Article XII.*					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	No	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.* • *The Township's Stormwater Management Plan was adopted in 2005*					
Urban Water Management Plan	No	N/A	No	No	-
Comment:					
Habitat Conservation Plan	Yes	Federal	No	No	-
Comment: The US Fish and Wildlife Service has produced a Comprehensive Conservation Planning document for the Wallkill River National Wildlife Refuge, which includes portions of Vernon Township.					
Economic Development Plan	No	N/A	No	No	-
Comment:					
Shoreline Management Plan	No	N/A	No	No	-
Comment:.					
Community Wildfire Protection Plan	No	N/A	No	No	-
Comment:					
Community Forest Management Plan	No	N/A	No	No	-
Comment:					
Transportation Plan	Yes	Local	No	No	-
Comment: The Township's Master Plan incorporates a Circulation Element.					
Agriculture Plan	No	N/A	No	No	-
Comment:					
Climate Action Plan	No	N/A	No	No	-
Comment:					
Tourism Plan	No	N/A	No	No	-
Comment:					
Business Development Plan	No	N/A	No	No	-
Comment:					
Other: Open Space Plan	Yes	Local	No	No	-
Comment: • *The Land Use Department and the Planner are responsible for this plan in compliance with Code Chapter 244.* • *Part 2 of the Master Plan includes Parks and Open Space. The Plan was adopted in 1995 and updated in 2016.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19. • *The Office of Emergency Management Coordinator is responsible for this plan in compliance with the Emergency Operations Plan.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	Yes	Local	No	Yes	
Comment:					
Post-Disaster Recovery Plan	No	N/A	No	No	-
Comment:					
Continuity of Operations Plan	Yes	Local	No	Yes	
Comment:					
Public Health Plan	No	N/A	No	No	-
Comment:					
Other: Stream Corridor Management Plan	No	N/A	No	No	-
Comment: • *This plan follows Code Chapter 330-Article XII.*					

Table 9.23-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes Building Department and Planning/Zoning
Does your jurisdiction have the ability to track permits by hazard area?	No
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Yes

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Vernon.

Table 9.23-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Vernon Township Land Use Board
Mitigation Planning Committee	No	
Environmental Board / Commission	Yes	Vernon Township Environmental Commission
Open Space Board / Committee	No	
Economic Development Commission / Committee	Yes	Vernon Township Economic Development Advisory Committee
Warning Systems / Services (reverse 911, outdoor warning signals)	No	
Maintenance program to reduce risk	No	
Mutual aid agreements	Yes	
Technical/Staffing Capability		

Staff/Personnel Resource	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices	Yes	Engineer/Planner
Engineers or professionals trained in building or infrastructure construction practices	Yes	Engineer
Planners or engineers with an understanding of natural hazards	Yes	Engineer
Staff with training in benefit/cost analysis	No	
Staff with training in green infrastructure	Yes	Engineer/Planner
Staff with education/knowledge/training in low impact development	Yes	Engineer/Planner
Surveyor	No	
Stormwater engineer	Yes	Cory Stoner (Harold Pellow & Associates)
Personnel skilled or trained in GIS applications	No	
Local or state water quality professional	No	
Scientist familiar with natural hazards in local area	No	
Emergency manager	Yes	Ken Clark, Emergency Management Coordinator
Watershed planner	No	
Environmental specialist	No	
Grant writers	No	
Resilience Officer	No	
Other: NFIP Floodplain Administrator	Yes	Construction Official (contracted service)

Fiscal Capability

The table below summarizes financial resources available to the Township of Vernon.

Table 9.23-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	No
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	Sewer only
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Vernon.

Table 9.23-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	No
Do you have personnel skilled or trained in website development?	Yes- individual contractor
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	OEM Facebook page—daily weather
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	Yes- OEM Facebook page
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	No

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Vernon.

Table 9.23-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	N/A	N/A
Building Code Effectiveness Grading Schedule (BCEGS)	No	N/A	N/A
Public Protection (Fire ISO Protection Class)	Yes	5x	Update to 3y
Storm Ready Certification	No	N/A	N/A
Firewise Community Classification	No	N/A	N/A
Sustainable Jersey	Yes	Bronze	11/3/2017

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.23-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate
Geologic	Moderate

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Strong
Wildfire	Moderate

Notes:
High = Capacity exists and is in use; Medium = Capacity may exist, but is not used or could use some improvement;
Low = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.23-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Building
Who is your floodplain administrator? (name, department/position)	Construction Official (contracted service to Harold Pellow & Associates)
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	September 12th 2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements set by FEMA and the State.
When was the most recent Community Assistance Visit or Community Assistance Contact?	July 27, 1994
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	No
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	26 policies
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	18 claims $119,012 in payments

Criterion	Response
Do you maintain a list of properties that have been damaged by flooding?	No
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

Additional Areas of Existing Integration

- The Division of Planning and Zoning and the Township's Land Use Board consider the Hazard Mitigation Plan and the information contained therein and will use the plan when updating the Township's Master Plan.
- The Township has taken steps to ensure the continuity of operations of municipal operations and infrastructure.

9.23.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Vernon's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.22-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.23-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Excessive clean up costs
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	Excessive unbudgeted costs for PPE to Emergency Services. Tax revenue down and municipal center closed 5 weeks
Tropical Storm Isais (8/4/20)	DR-4574-NJ	Yes	A major tropical storm produced excessive winds and storm damage August 4, 2020	Clean up costs in excess of $120,000.00
Jan 31-Feb 2, 2021	Severe Winter storm	No	A major winter snow event that dropped 30+ inches of snow in blizzard conditions.	Clean up Costs in excess of $100,000.00

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

9.23.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Vernon risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Vernon that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Vernon has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Vernon.

- Number of repetitive loss (RL) properties: 2
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

**According to FEMA statistics as of October 13, 2020*

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.23-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
Dorothy Henry Library Branch	Shelter	Y	Y
Canistear Reservoir #2 Dam	Dam	Y	Y
Lake Wanda Dam	Dam	Y	Y
Kohout Lake Dam	Dam	Y	Y
Hickory Park Dam	Dam	Y	Y

Source: Sussex County Planning Partnership 2020
Note:
**Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction did not identify any problem areas in the Township.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Vernon ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and

rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Vernon. The Township of Vernon has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Vernon indicated the following reasons why hazard rankings have changed since the 2016 HMP:

- Geologic hazards were reduced to a "Medium" rank from "high" due to low event frequency and impact.

Table 9.23-13. Township of Vernon Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Medium	Medium	Medium	Low	Medium	Medium

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Medium

9.23.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.22-15 and Table 9.22-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.23-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update? Check if Yes	Include in the 2021 HMP Update? Enter 2021 HMP Action #
Vernon-1 (new)	Utilize the Hazard Mitigation Plan (HMP) when updating the Comprehensive Master Plan; consider including hazard identification, hazard zones risk assessment information, and hazard mitigation goals as identified in the HMP. Further, the findings and recommendation of the HMP will be considered during any future site plan review processes.	Planning	Ongoing Capability		

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Vernon-2 (old #2)	When replacing the roof of the Vernon Valley Police Department building on Church Street, ensure that it meets the current snow load standards.	Police Chief	Completed		
Vernon-3 (old #3)	When replacing the roof of the Lounsberry Hollow School building on Sammis Road, ensure that it meets the current snow load standards.	School Board Administrator	Completed		
Vernon-4 (old #4)	When replacing the roof of the High School building on Route 565, ensure that it meets the current snow load standards.	School Board Administrator	Completed		
Vernon-5 (old #5)	Implement the Fire Wise Program throughout the township.	OEM Coordinator	No Progress	X	2021-VernonTwp-003
Vernon-6 (old #6)	When replacing the roof of the Glen Meadows School building on Sammis Road, ensure that it meets the current snow load standards.	School Board Administrator	Completed		
Vernon-7 (old #7)	When replacing the roof of the Cedar Mountain School building on Sammis Road, ensure that it meets the current snow load standards.	School Board Administrator	Completed		
Vernon-8 (old #8)	When replacing the roof of the Rolling Hill School building on Sammis Road, ensure that it meets the current snow load standards.	School Board Administrator	Completed		
Vernon-9 (old #9)	When replacing the roof of the Walnut Ridge School building on Route 517, ensure that it meets the current snow load standards.	School Board Administrator	Completed		
Vernon-10 (old #10)	Stormwater management system upgrade and improvement along Maple Grange Road and Vernon Crossing Road.	DPW	Completed		
Vernon-11 (old #12)	Stormwater management system along Tenneco Pipeline.	DPW	Completed		
Vernon-12 (old #13)	Harden SES Americom building located on route 517 and Edsel Drive to FEMA 361 Standards.	Facility Administrator	No progress		
Vernon-13	Conduct all-hazards public education and outreach program for hazard mitigation	OEM Coordinator in	Ongoing capability		

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
(old #14)	and preparedness. This will include providing better information regarding hazard risks and high-hazard areas in the Township.	coordination with County OEM			
Vernon-14 (new)	Ensure continuity of operations at critical facilities, municipal buildings, and infrastructure. At this time, the following was identified: Develop an action plan to improve the damage resistance of utilities (electricity, communications) throughout the Township.	Township with support from utility providers	Ongoing capability		

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Vernon participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Vernon participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.22-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Vernon would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.22-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.23-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Vernon-001	PPE Acquisition/Pandemic Response	**Problem**: During the current COVID-19 pandemic, the Township did not have an adequate supply of personal protective equipment (PPE) for municipal staff. Without proper PPE, it puts municipal staff and residents at risk to the spread of infectious diseases. **Solution:** The Township will purchase PPE to create a stockpile for municipal staff. This will include gloves, masks, gowns, antibacterial handwash, antiviral cleaning solutions, sanitizers, and misters. This equipment can be used for the COVID-19 pandemic response as well as future infectious disease outbreaks, such as pandemic influenza.	N/A	Disease Outbreak	1, 2, 3, 6	Township OEM	BRIC, NJDCA, Township Budget, FEMA Assistance to Firefighters Grant	Increase protection from diseases; decrease risk of spread	$75,000	Within 2 years	High	LPR	PR, ES
2021-Vernon 002	Vegetation Management Planning and Implementation	**Problem**: Vernon experiences frequent storm damage from downed trees. The Township's roads are surrounded by vegetation over-growth throughout the Township's 68 square miles. County Route 515, one of the Township's busiest roads, is particularly impacted by downed trees. The Township has identified that 14 miles of vegetation management is needed to reduce impacts from trees to utility and vehicle right-of-ways. During storm events, delays of up to six hours are reported due to trees in the road. **Solution:** The Township proposes to develop a proactive vegetation management plan and contract with a vegetation management company to prioritize vegetation removal, implement best practices, and cutback overgrown and dead vegetation to reduce impacts of downed trees.	New	Hurricane and Tropical Storm; Nor'easter; Severe Storm; Severe Winter Storm; Wildfire	1, 2, 3, 6	Sussex County; Vernon Township DPW	BRIC; HMGP; Township Funds;	Enhanced utility of roads and decreased frequency of power outage following hazard events	$2 million	Within three years	High	LPR	PR, ES
2021-Vernon-003	Firewise Program Participation	**Problem**: The national Firewise USA® recognition program provides a collaborative framework to help	Both	Wildfire	1, 2, 3, 4, 5	Township OEM and	Township Budget, Staff Time	Helps Township	$10,000+	Within	High	LPR, EAP	PI, ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		neighbors in a geographic area get organized, find direction, and take action to increase the ignition resistance of their homes and community and to reduce wildfire risks at the local level. The Township is currently not part of the Firewise program. **Solution:** The Township will follow the proper steps in applying for and becoming a Firewise community. This includes forming a board/committee, obtaining a wildfire risk assessment, developing an action plan, and hosting outreach events and programs. The application will be completed online.				Fire Department		identify wildfire safety efforts; access to funding and assistance		5 years			
2021-Vernon-004	Update Flood Damage Prevention Ordinance	**Problem**: The Township's current flood damage prevention ordinance was last adopted in 2011. It currently does not have a freeboard requirement and does not meeting New Jersey's minimum requirement. **Solution:** The Township will update its flood damage prevention ordinance to meet the New Jersey requirement of one foot of freeboard.	New and Existing	Flood	1, 2	Township Administration, Construction Official	Township budget	Meet state standards, reduce future flood risk	Staff time	6 months	High	LPR	PR

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

BRIC	*Building Resilient Infrastructure and Communities*
FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*

- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.23-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
001	PPE Acquisition/Pandemic Response	1	0	1	1	1	1	0	1	1	1	1	1	1	1	12	High ⚠
002	Vegetation Management Planning and Implementation	1	1	1	1	1	1	0	0	1	1	1	1	1	1	12	High
003	Firewise Program Participation	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
004	Update Flood Damage Prevention Ordinance	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.23-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure								
Disease Outbreak	X				X			
Drought								
Earthquake								
Flood	X							
Geologic								
Hazardous Materials								
Hurricane and Tropical Storm	X				X			
Invasive Species								
Nor'Easter	X				X			
Severe Weather	X				X			
Severe Winter Weather	X				X			
Wildfire	X		X		X			

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard
ORANGE medium ranked hazard
YELLOW low ranked hazard

Figure 9.23-1. Township of Vernon Hazard Area Extent and Location Map 1

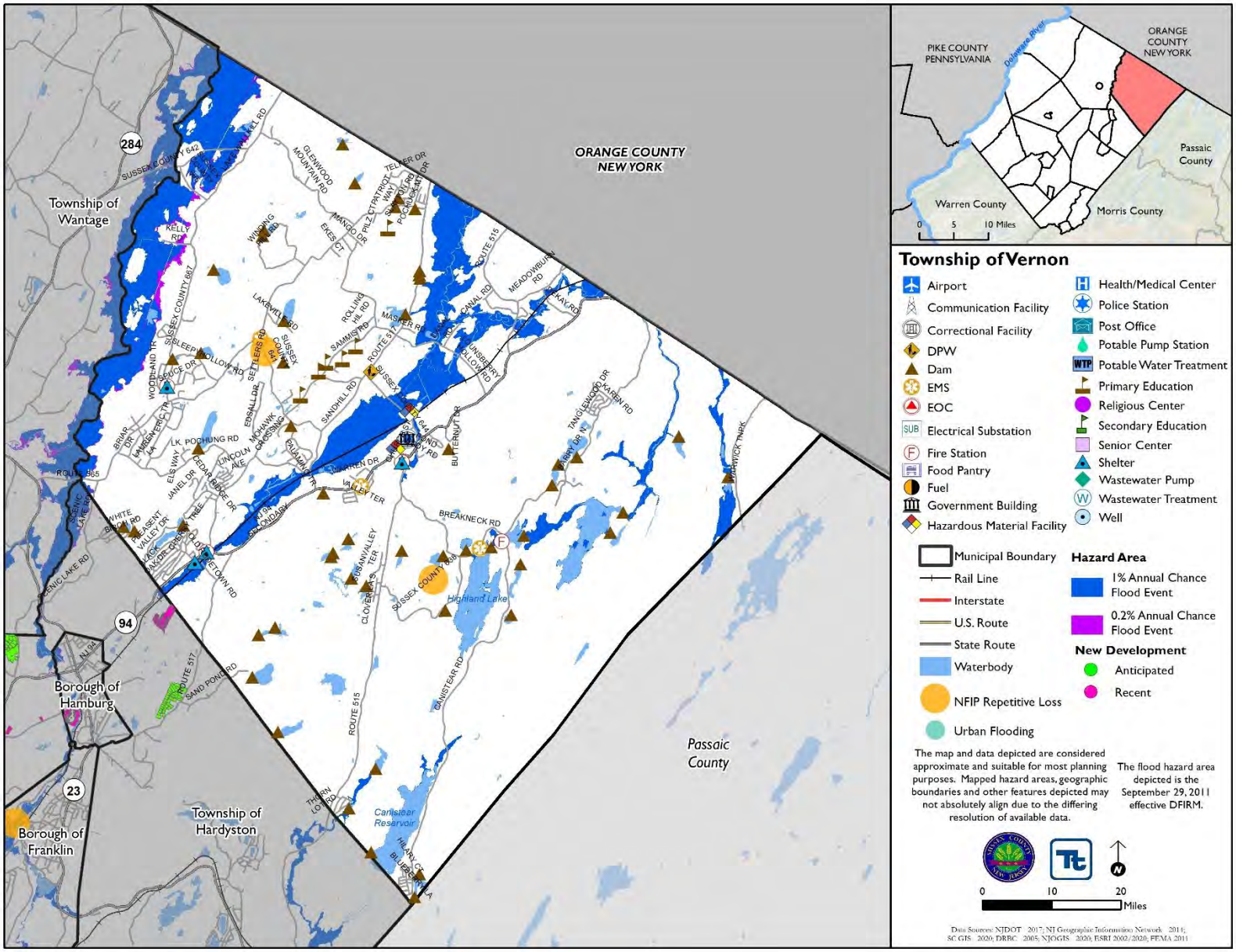


Figure 9.23-2. Township of Vernon Hazard Area Extent and Location Map 2

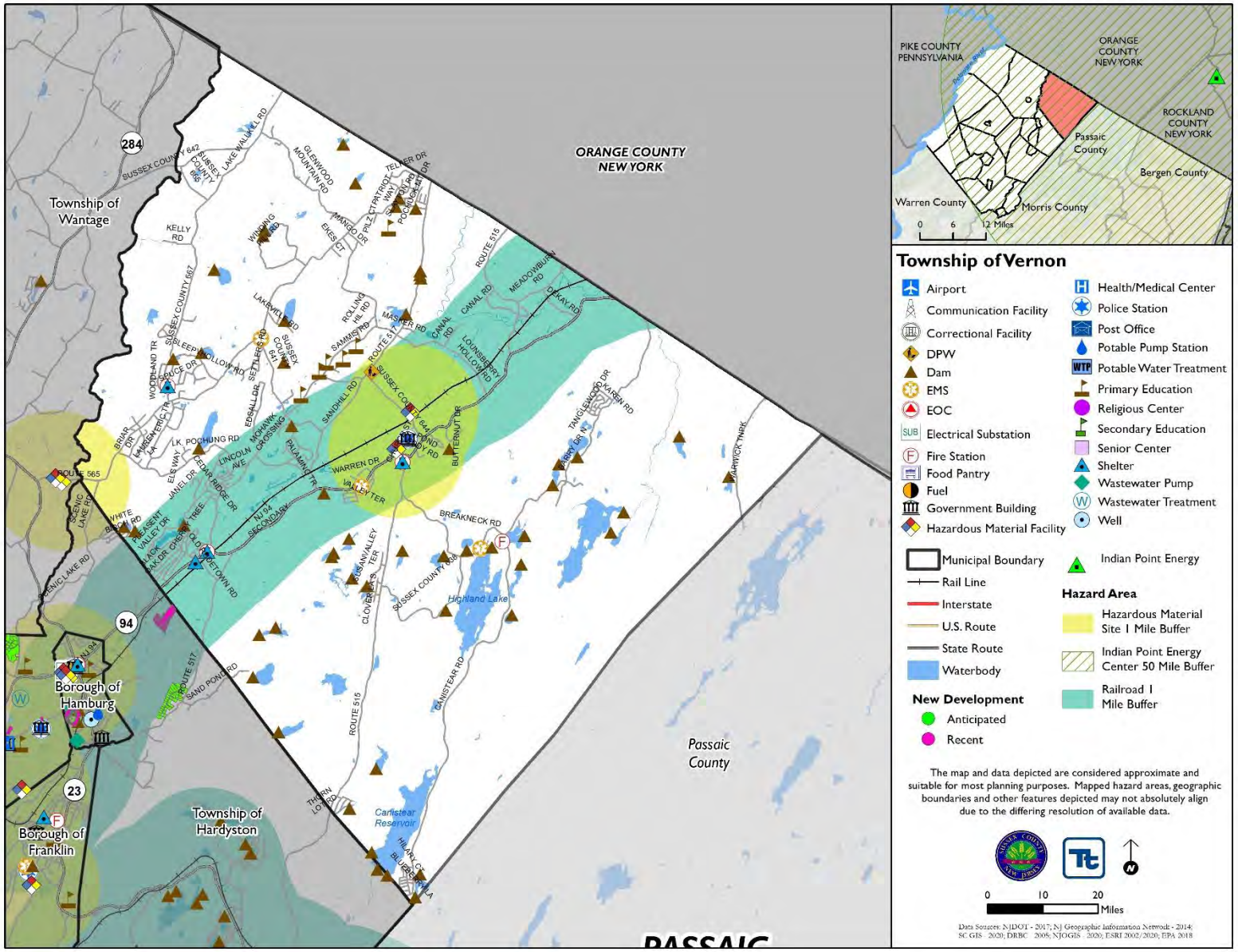
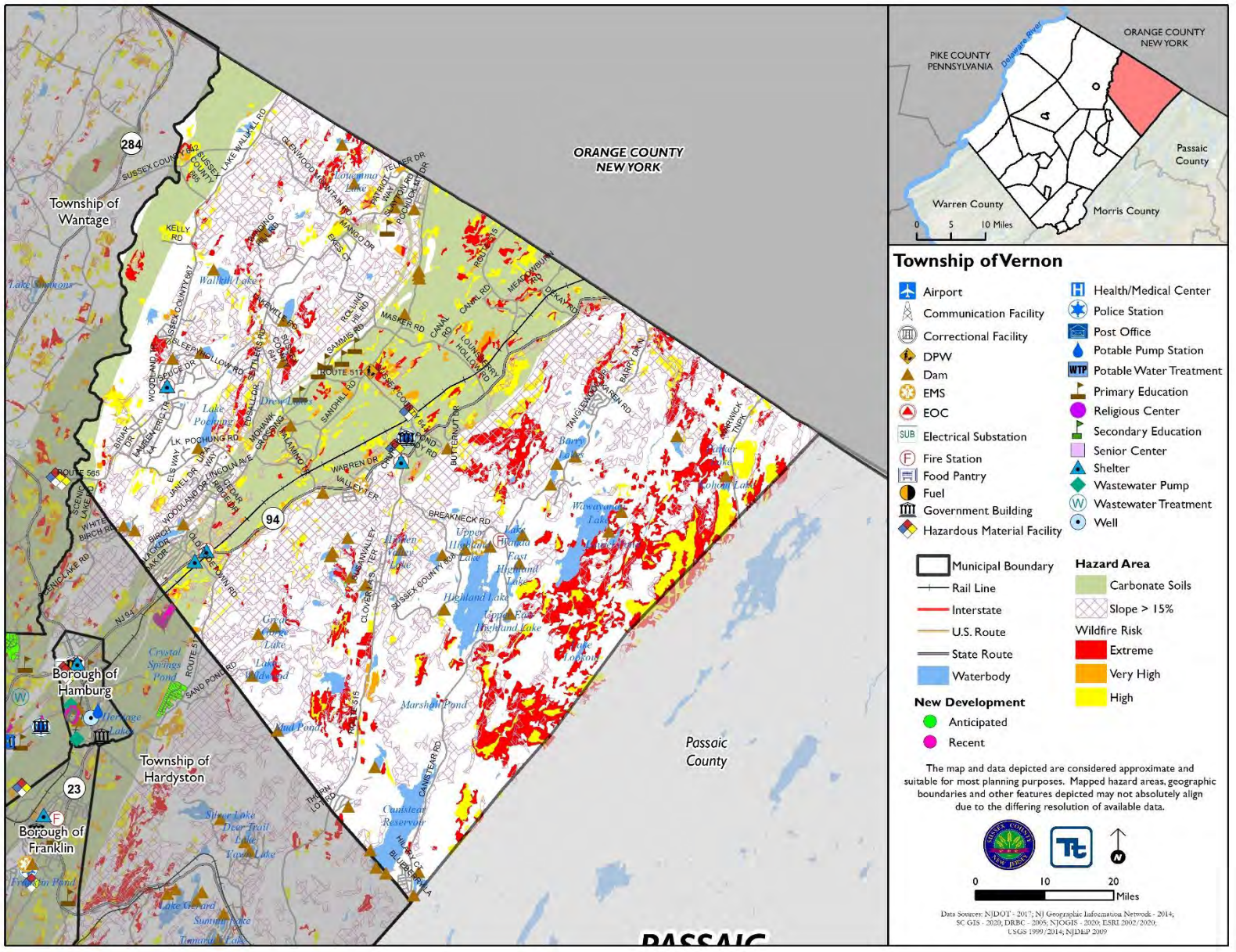


Figure 9.23-3 Township of Vernon Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	PPE Stockpile		
Project Number:	2021-Vernon-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Disease Outbreak		
Description of the Problem:	During the current COVID-19 pandemic, the Township did not have an adequate supply of personal protective equipment (PPE) for municipal staff. Without proper PPE, it puts municipal staff and residents at risk to the spread of infectious diseases. This equipment can be used for the COVID-19 pandemic response as well as future infectious disease outbreaks, such as pandemic influenza.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will purchase PPE to create a stockpile for municipal staff. This will include gloves, masks, gowns, antibacterial handwash, antiviral cleaning solutions, sanitizers, and misters.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	PPE	**Estimated Benefits (losses avoided):**	Increase protection from diseases; decrease risk of spread
Useful Life:	Supply needs to be replaced after use	**Goals Met:**	1, 2, 3, 6
Estimated Cost:	$50,000	**Mitigation Action Type:**	Local Plans and Regulations
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 2 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	BRIC, NJDCA, Township Budget, FEMA Assistance to Firefighters Grant
Responsible Organization:	Township OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Shut down during disease outbreak events	N/A	Loss of continuity of operations
	Rely on county/state/federal distribution	$0	Supply not guaranteed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	PPE Stockpile	
Project Number:	2021-Vernon-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protects life from disease outbreak
Property Protection	0	
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require funding support.
Environmental	1	
Social	1	Project would help protect families from disease outbreak events
Administrative	1	
Multi-Hazard	1	Disease Outbreak
Timeline	1	
Agency Champion	1	OEM
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Vegetation Management Planning and Implementation		
Project Number:	2021-Vernon-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Hurricane and Tropical Storm; Nor'easter; Severe Storm; Severe Winter Storm; Wildfire		
Description of the Problem:	Vernon experiences frequent storm damage from downed trees. The Township's roads are surrounded by vegetation over-growth throughout the Township's 68 square miles. County Route 515, one of the Township's busiest roads, is particularly impacted by downed trees. The Township has identified that 14 miles of vegetation management is needed to reduce impacts from trees to utility and vehicle right-of-ways. During storm events, delays of up to six hours are reported due to trees in the road.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township proposes to develop a proactive vegetation management plan and contract with a vegetation management company to prioritize vegetation removal, implement best practices, and cutback overgrown and dead vegetation to reduce impacts of downed trees.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	PPE	**Estimated Benefits (losses avoided):**	Enhanced utility of roads and decreased frequency of power outage following hazard events
Useful Life:	Supply needs to be replaced after use	**Goals Met:**	1, 2, 3, 6
Estimated Cost:	$2 million	**Mitigation Action Type:**	Local Plans and Regulations
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 3 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	BRIC; HMGP; Township Funds
Responsible Organization:	Township DPW/Contractor	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Ad-hoc vegetation management	High	Continued damage/less efficient use of resources
	Vegetation management plan/implementation	$2 million	Proactive management

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Vegetation Management Planning and Implementation	
Project Number:	2021-Vernon-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protects life from disease outbreak
Property Protection	1	
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require funding support.
Environmental	0	
Social	1	Project would help protect families from disease outbreak events
Administrative	1	
Multi-Hazard	1	Multiple types of storm/wind events
Timeline	1	
Agency Champion	1	County; Township OEM/PW
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

9.24 TOWNSHIP OF WALPACK

This section presents the jurisdictional annex for the Township of Walpack. The annex includes a general overview of the Township of Walpack; an assessment of the Township of Walpack's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.24.1 Hazard Mitigation Planning Team

The Township of Walpack followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.24-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Victor Maglio, Mayor Address: 9 Main Street, Walpack Center, NJ 07881 Phone Number: 973-479-6976 Email: walpackmayor@gmail.com	Name / Title: Michael Vreeland, Township Engineer, Van Cleef Engineering Address: 111 Howard Blvd Suite 101, Mt Arlington, NJ 07856 Phone Number: 862-284-1100 Email: mvreeland@vancleefengineering.com
NFIP Floodplain Administrator	
Name / Title: Michael Vreeland, Township Engineer, Van Cleef Engineering Address: 111 Howard Blvd Suite 101, Mt Arlington, NJ 07856 Phone Number: 862-284-1100 Email: mvreeland@vancleefengineering.com	

Name	Title	Method of Participation
Victor Maglio, Mayor	Victor Maglio, Mayor	Primary point of contact, attended meetings, provided data and information on past impacts, contributed to the mitigation strategy
Michael Vreeland	Township Engineer, Van Cleef Engineering	Alternate point of contact, NFIP floodplain administrator

9.24.2 Jurisdiction Profile

The Township of Walpack is located in western Sussex County and has a total area of 24.7 square miles. It is the oldest municipality in Sussex County. The following unincorporated communities are located within the Township: Wallpack Center, Haneys Mill, Smith Ferry, Flatbrookville, and Donkeys Corners. The Township is bordered to the north by Sandyston Township, to the east by Stillwater and Hampton Townships, to the south by Warren County, and to the west by Pennsylvania. The Delaware River forms the western border of the Township. Other streams flow through the Township and include: Flat Brook and its tributaries and Vancampens Brook and its tributaries. There are also several lakes and ponds that include Crater Lake, Lake Success, Long Pine Pond, and Hemlock Lake.

A majority of the land in the Township is under the jurisdiction of the National Park Service. The National Park Service also has jurisdiction over the Township's roadways.

According to the U.S. Census, the 2010 population for the Township of Walpack was 16. The estimated 2018 population was 6, a 37.5 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 0.0 percent of the population is 5 years of age or younger and 100.0 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.24.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.23-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.24-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	0	0	0	0	0	0	0	0	0	0
Multi-Family	0	0	0	0	0	0	0	0	0	0
Other (commercial, mixed-use, etc.)	0	0	0	0	0	0	0	0	0	0

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
None identified					
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None anticipated					

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.24.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Walpack performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of legal and regulatory capabilities
- Development and permitting capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities

- Information on NFIP compliance
- Classification under various community mitigation programs
- The community's adaptive capacity for the impacts of climate change

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Walpack identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Walpack and where hazard mitigation has been integrated.

Table 9.24-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019*					
Zoning Code	Yes	State & Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.*					
Subdivisions	Yes	County & Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.*					
Stormwater Management	Yes	State & Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8*					
Post-Disaster Recovery	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans? If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Real Estate Disclosure	Yes	State, Division of Consumer Affairs	Yes	No	
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	No	-	Yes – if municipality has a Planning Board	-	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.*					
Site Plan Review	Yes	County & Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of commissioners of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.*					
Environmental Protection	No	-	No	-	-
Comment:					
Flood Damage Prevention	Yes	State & Local	Yes	Yes	-
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance.* • *Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	No	-	No	-	-
Comment:					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans? If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Other	No	-	No	-	-
Comment: •					
Planning Documents					
Comprehensive / Master Plan	No	State & Local	Yes	No	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen commissioners with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity.*					
Capital Improvement Plan	No	-	No	-	-
Comment:					
Disaster Debris Management Plan	No	-	No	-	-
Comment:					
Floodplain or Watershed Plan	No	-	No	-	-
Comment:					
Stormwater Management Plan	No	State & Local	Yes	-	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.*					
Stormwater Pollution Prevention Plan	No	-	Yes	-	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans? If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					
Community Wildfire Protection Plan	No	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	No	-	No	-	-
Comment:					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	No	-	No	-	-
Comment:					
Other	No	-	No	-	-
Comment: •					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	No	-	Yes	-	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	No	-	No	-	-
Comment:					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	No	-	No	-	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Comment:					
Other	No	-	No	-	-
Comment: •					

Table 9.24-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Township Engineer. However, development has occurred in recent years.
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	Because the National Park Service owns the majority of land in the Township, opportunities for developing land are incredibly rare.

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Walpack.

Table 9.24-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	No	-
Mitigation Planning Committee	No	-
Environmental Board / Commission	No	-
Open Space Board / Committee	No	-
Economic Development Commission / Committee	No	-
Warning Systems / Services (reverse 911, outdoor warning signals)	Yes	County 911 System
Maintenance program to reduce risk	Yes	Emergency Operations Plan
Mutual aid agreements	Yes	With surrounding communities and State Police: EMS – Blue Ridge for north end and Blairstown Rescue Squad for south end; participation in the County 911 system; firefighting services by shared agreement with Sandyston Township Volunteer Fire Department
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Township Engineer and work with County engineering when necessary
Engineers or professionals trained in building or infrastructure construction practices	Yes	Township Construction Official in cooperation with the County
Planners or engineers with an understanding of natural hazards	Yes	Township Engineer
Staff with training in benefit/cost analysis	Yes	Township Engineer
Staff with training in green infrastructure	No	-

Staff/Personnel Resource	Available?	Department/Agency/Position
Staff with education/knowledge/training in low impact development	Yes	Township Engineer
Surveyor	No	-
Stormwater engineer	Yes	Township Engineer
Personnel skilled or trained in GIS applications	No	-
Local or state water quality professional	Yes	Township. Engineer
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Victor Maglio, Mayor/Emergency Operations Coordinator
Watershed planner	No	-
Environmental specialist	No	-
Grant writers	No	-
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Township Engineer
Other: Professionals trained in conducting damage assessments	Yes	Construction Official and Township Engineer

Fiscal Capability

The table below summarizes financial resources available to the Township of Walpack.

Table 9.24-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Unknown
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	Unknown
Other: Open Space Acquisition Funding Programs	Yes

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Walpack.

Table 9.24-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes – Mayor and Clerk
Do you have personnel skilled or trained in website development?	Yes – Contracted Individual
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	Yes – Community Notifications such as COVID-19

Criterion	Response
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	No

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Walpack.

Table 9.24-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	No	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	No	-	-

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.24-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Moderate
Disease Outbreak	Moderate
Drought	Moderate
Earthquake	Moderate
Flood	Moderate
Geologic	Moderate
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Moderate
Nor'Easter	Moderate
Severe Weather	Moderate
Severe Winter Weather	Strong

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Wildfire	Moderate

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

The Township has access to resources found in the public domain to determine the possible impacts of climate change upon the municipality. To date, integrating climate change in policies or actions has not yet been considered by the Township Committee.

NATIONAL FLOOD INSURANCE PROGRAM

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.24-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Township Engineer
Who is your floodplain administrator? (name, department/position)	Michael Vreeland, Township Engineer
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	2006
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	Meets, however the flood damage prevention ordinance requires update.
When was the most recent Community Assistance Visit or Community Assistance Contact?	July 31, 2006
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	Yes, additional training for a new floodplain administrator would be useful.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	0 policies $0 insurance in force $0 premium in force
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	1 claim $7,076 payments
Do you maintain a list of properties that have been damaged by flooding?	No properties have been damaged in the past.
Do you maintain a list of property owners interested in flood mitigation?	No property owners are currently interested.

**According to FEMA statistics as of October 13, 2020*

Source: FEMA 2020

Additional Areas of Existing Integration

- **National Park Service:** The National Park Service has jurisdiction over the roadways in the Township and conducts upkeep and clearing during storm events.

9.24.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Walpack's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.23-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.24-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Predominantly tree damage and power outages
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	Economic impacts on local businesses (i.e. The Walpack Inn)

Source: FEMA 2020, NOAA NCEI 2020

9.24.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Walpack risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Walpack that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Walpack has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Walpack.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0

- Number of RL/SRL properties that have been mitigated: 0

Source: NFIP 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.24-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
Haneys Mill Dam (No Dam)	Dam	X	X
No Name #59 Dam	Dam	X	X

Source: Sussex County Planning Partnership 2020
Note:
**Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the following vulnerabilities within their community:

- The Township experiences isolated low-lying roadway flooding not directly associated with floodplain (mainly at Old Mine Road and National Park Service Route 615 near the Flat Brook Bridge).
  - The roadways are under the jurisdiction of the National Park Service.
- Downed trees often result in power loss in the Township during storm events.
  - The Park Service is responsible for clearing of downed trees.
  - JCP&L has been trying to relocate lines out to the main road. Old powerlines run through woods that are hard to access.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Walpack ranked each hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Walpack. The Township of Walpack has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Walpack indicated the following reasons why hazard rankings have changed since the 2016 HMP:

- The Township agreed with the calculated hazard rankings.
- The Township changed the risk ranking for geologic hazards from high to medium based on low occurrence and low development.

- The Township changed the risk ranking for wildfire from high to medium due to lower occurrence of events and mitigation actions such as prescribed burns taken by the state and the National Park Service.

Table 9.24-13. Township of Walpack Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Low	Medium	Medium	Low	Medium	Medium

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	High	Medium	High	High	High	Medium

9.24.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.23-15 and Table 9.23-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.24-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update?	
				Check if Yes	Enter 2021 HMP Action #
Walpack-1 (new)	Ensure continuity of operations in the Township. At this time, purchase and install a generator at municipal building that serves as EOC, shelter, etc.	Township	Personal generators purchased by residents and businesses mitigated Still require Township Municipal Building generator.	X	2020-Walpack-001
Walpack-2 (new)	Continue to maintain and enhance mutual aid and shared services agreements with surrounding municipalities.	Township with support of the County and surrounding municipalities	Ongoing Capability		
Walpack-3 (old #2)	Implement Fire Wise Program throughout the Township.	Township	No Progress		
Walpack-4 (old #3)	Conduct all-hazards public education and outreach program for hazard mitigation and preparedness.	Township	Ongoing Capability		

In addition to the above progress, the Township of Walpack identified the following mitigation projects/activities that were completed but not identified in the 2016 HMP mitigation strategy:

- The Parks Service has made some roadway improvements near Mill Brook to reduce flooding of the roadway.

Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Walpack participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Walpack participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.23-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Walpack would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.23-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.24-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Walpack-001	Municipal Building Backup Power	**Problem**: Backup power sources are necessary to maintain critical services for critical facilities. The Township Municipal Building requires a backup power source. **Solution:** The Engineer will research what size generator is needed to power the Township Municipal Building. The Township will then purchase and install the selected generator and necessary electrical components to supply backup power to the Municipal Building.	Existing	Severe Storm, Severe Winter Storm, Hurricane, Nor'Easter	1, 2, 6	Engineer, Emergency Manager	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget	Continuity of operations	$50,000	Within 5 years	High	SIP	ES
2020-Walpack-002	Relocate Power Lines	**Problem**: Downed trees often result in power loss in the Township during storm events. **Solution:** The Township will support JCP&L efforts to relocate power lines out of wooded areas to areas along roadways. This will reduce likelihood of falling trees resulting in power loss and increased capability for tree trimming.	Existing	Severe Storm, Severe Winter Storm, Hurricane, Nor'Easter	2	JCP&L, Township Administration, National Park Service	HMGP, BRIC, JCP&L	Reduction in power loss	High	Within 5 years	High	SIP	PP
2020-Walpack-003	Low-lying Roadway Flooding	**Problem**: The Township experiences isolated areas of roadway flooding not directly associated with flood plain (mainly at Old Mine Road and National Park Service Route 615 near thee Flat Brook Bridge). **Solution:** The Township will work with the National Park Service to identify flooding of low-lying roadways. An engineering study will be conducted to determine cost-effective mitigation actions. The National Park Service will then implement the identified actions when funding is available. The Township will partner on grant applications where feasible.	Existing	Severe Storm, Flood	2	National Park Service, Township Administration	HMGP, BRIC, National Park Service budget	Reduction in flood risk of roadways	TBD by engineering study	Within 5 years	High	SIP	SP, PP

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2020-Walpack-004	Update Flood Damage Prevention Ordinance	**Problem**: The Township's Flood Damage Prevention Ordinance is outdated and requires update. **Solution:** The Township will update and adopt a new Ordinance to meet current standards. The Ordinance will also change the floodplain administrator from the clerk to the engineer.	New	Flood	2, 5	Administration	Township budget	Meet NFIP standards	Staff time	Within 6 months	High	LPR	PR
2020-Walpack-005	Floodplain Administrator Training	**Problem**: The Township Engineer is new to the role of Floodplain Administrator. **Solution:** The Engineer will attend training for floodplain administration offered by FEMA and NJ DEP.	N/A	Flood	5	Administration	Township budget	Increased capability of FPA	Staff time	1 year	High	LPR	PR

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC	*Building Resilient Infrastructure and Communities*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*
- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*
- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*

- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.24-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community	Total	High / Medium / Low
2020-Walpack-001	Municipal Building Backup Power	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High ⚠
2020-Walpack-002	Relocate Power Lines	1	1	1	1	1	0	0	1	1	1	1	0	1	1	11	High
2020-Walpack-003	Low-lying Roadway Flooding	1	1	1	1	1	0	0	1	1	1	1	0	1	1	11	High
2020-Walpack-004	Update Flood Damage Prevention Ordinance	0	1	1	1	1	1	1	1	1	1	0	1	1	1	12	High
2020-Walpack-005	Floodplain Administrator Training	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.24-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure								
Disease Outbreak								
Drought								
Earthquake								
Flood	X	X				X	X	X
Geologic								
Hazardous Materials								
Hurricane and Tropical Storm		X			X	X		
Invasive Species								
Nor'Easter		X			X	X		
Severe Weather		X			X	X		
Severe Winter Weather		X			X	X		
Wildfire								

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard

ORANGE medium ranked hazard

YELLOW low ranked hazard

Figure 9.24-1. Township of Walpack Hazard Area Extent and Location Map 1

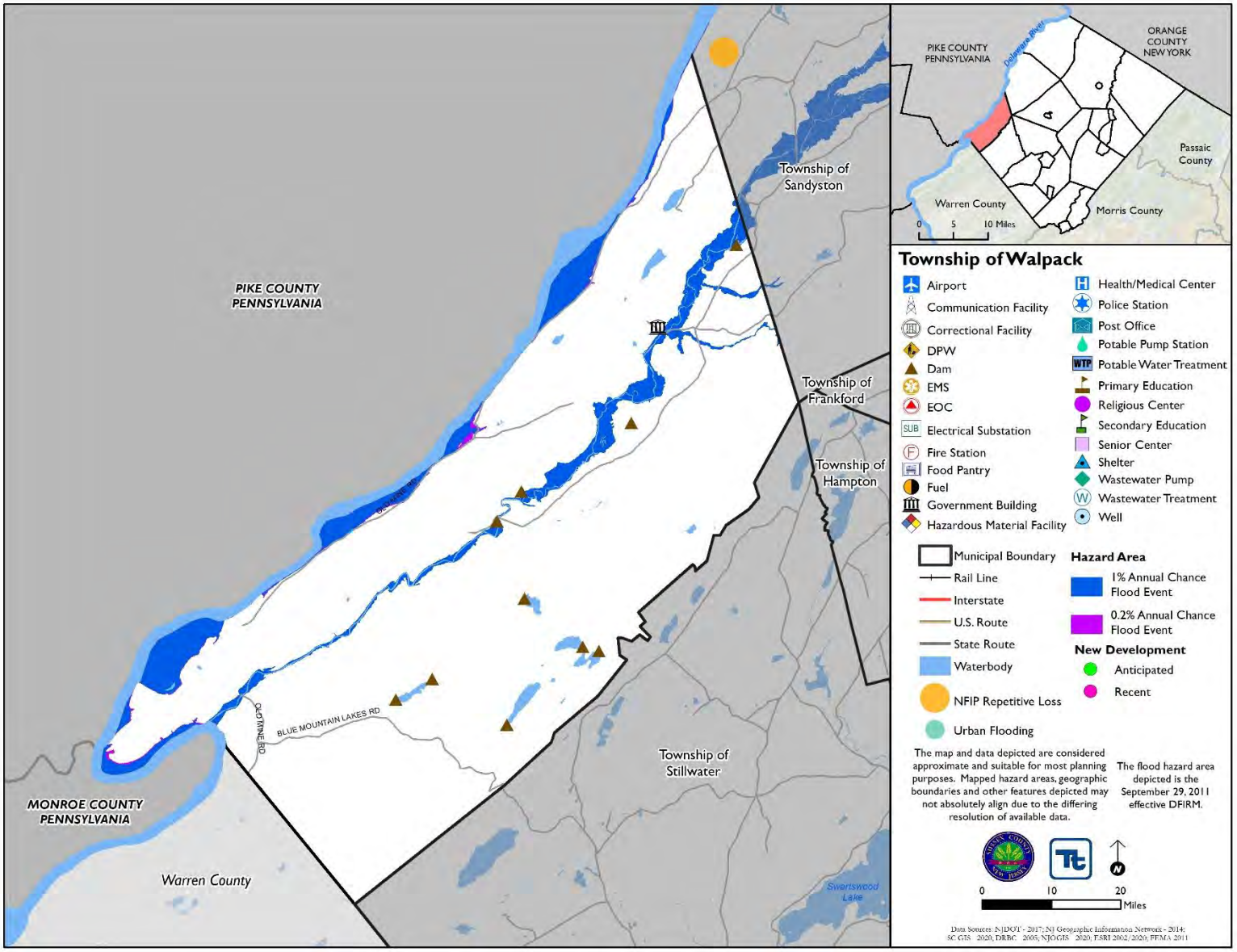


Figure 9.24-2. Township of Walpack Hazard Area Extent and Location Map 2

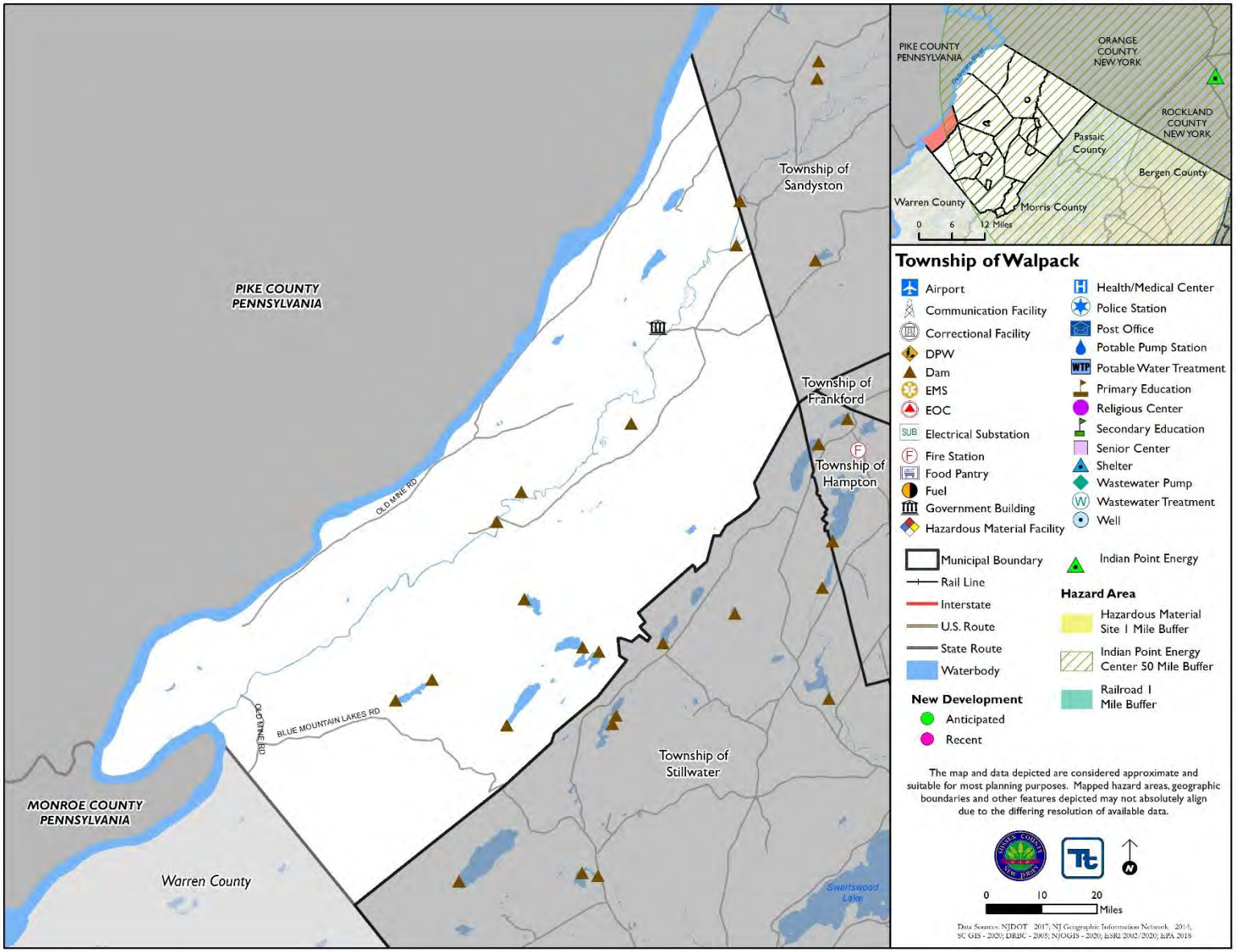
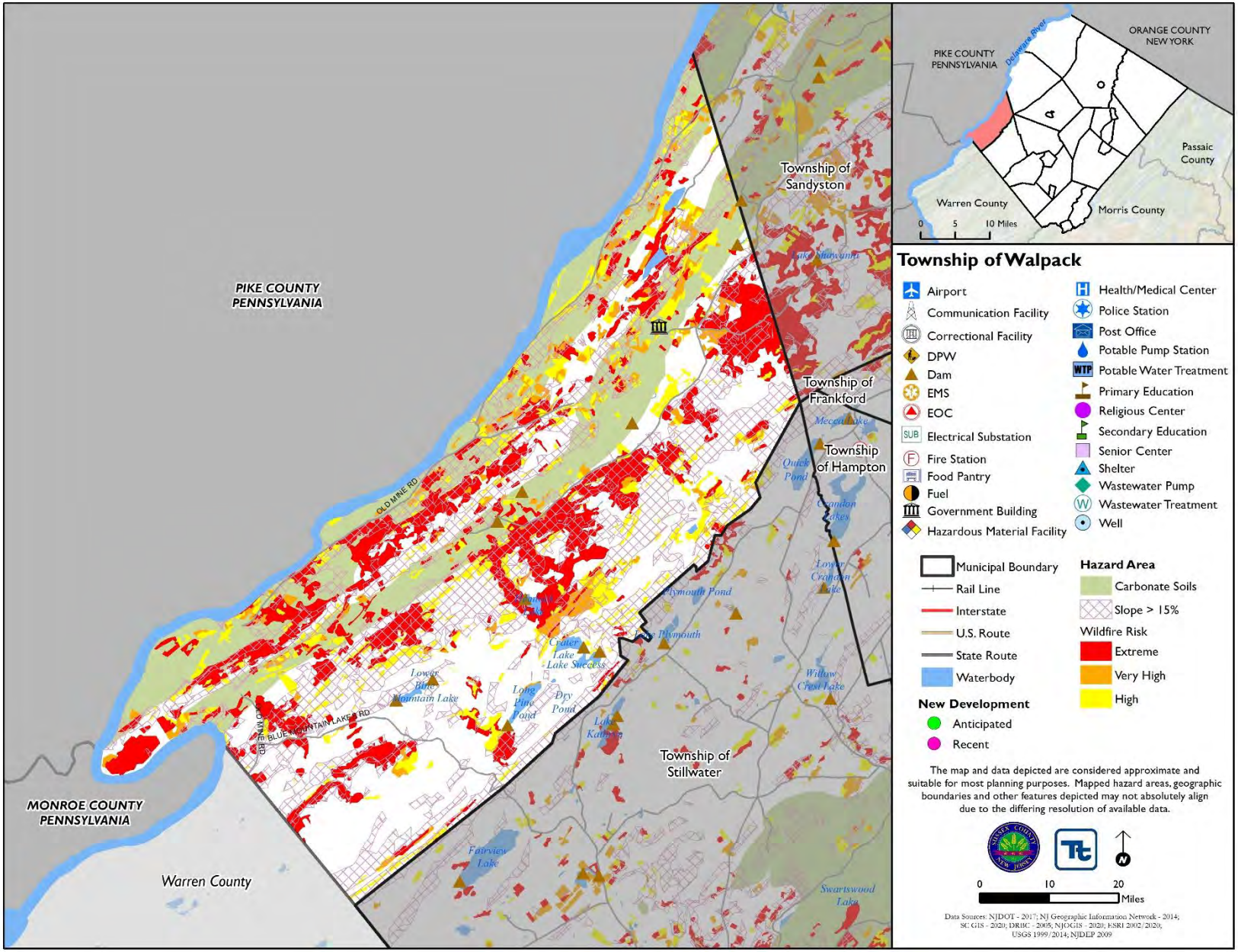


Figure 9.24-3 Township of Walpack Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Municipal Building Backup Power		
Project Number:	2020-Walpack-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Severe Storm, Severe Winter Storm, Hurricane, Nor'Easter		
Description of the Problem:	Backup power sources are necessary to maintain critical services for critical facilities. The Township Municipal Building requires a backup power source.		
Action or Project Intended for Implementation			
Description of the Solution:	The Engineer will research what size generator is needed to power the Township Municipal Building. The Township will then purchase and install the selected generator and necessary electrical components to supply backup power to the Municipal Building.		
Is this project related to a Critical Facility?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Ensures continuity of operations of DPW building
Useful Life:	20 years	**Goals Met:**	1, 2, 6
Estimated Cost:	$50,000	**Mitigation Action Type:**	Structure and Infrastructure Projects (SIP)
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Municipal Budget
Responsible Organization:	Public Works	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Problem continues.
	Install solar panels	$100,000	Weather dependent; need large amount of space for installation; expensive if repairs needed
	Install wind turbine	$100,000	Weather dependent; poses a threat to wildlife; expensive repairs if needed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Municipal Building Backup Power	
Project Number:	2020-Walpack-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Project will protect critical services of Township Municipal Building
Property Protection	1	Project will protect building from power loss.
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has the legal authority to complete the project.
Fiscal	0	Project requires funding support.
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	1	Severe Storm, Severe Winter Storm, Hurricane, Nor'Easter
Timeline	0	Within 5 years
Agency Champion	1	Engineer, Emergency Manager
Other Community Objectives	1	
Total	12	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	Low-lying Roadway Flooding		
Project Number:	2020-Walpack-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	The Township experiences isolated areas of roadway flooding not directly associated with flood plain (mainly at Old Mine Road and National Park Service Route 615 near thee Flat Brook Bridge).		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will work with the National Park Service to identify flooding of low-lying roadways. An engineering study will be conducted to determine cost-effective mitigation actions. The National Park Service will then implement the identified actions when funding is available. The Township will partner on grant applications where feasible.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	TBD by engineering study	**Estimated Benefits (losses avoided):**	Reduction in flood risk
Useful Life:	TBD by engineering study	**Goals Met:**	2
Estimated Cost:	TBD by engineering study	**Mitigation Action Type:**	Structure and Infrastructure Projects
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 5 years
Estimated Time Required for Project Implementation:	5 years	**Potential Funding Sources:**	HMGP, BRIC, municipal budget
Responsible Organization:	National Park Service, Township Administration	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard mitigation planning, stormwater planning

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Elevate roadways	$500,000	Costly and may not solve problem
	Relocate roadways	N/A	Not possible

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Low-lying Roadway Flooding	
Project Number:	2020-Walpack-003	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	.
Property Protection	1	Reduction in flooding risk
Cost-Effectiveness	1	
Technical	1	Technically feasible project
Political	1	
Legal	0	The Township does not have the legal authority to conduct the project on its own. The roadways are under the jurisdiction of the National Park Service.
Fiscal	0	Project will require grant funding.
Environmental	1	
Social	1	Project would reduce flooding impacts.
Administrative	1	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	National Park Service, Township Administration
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	

9.25 TOWNSHIP OF WANTAGE

This section presents the jurisdictional annex for the Township of Wantage. The annex includes a general overview of the Township of Wantage; an assessment of the Township of Wantage's risk, vulnerability, and mitigation capabilities; and a prioritized action plan to implement prior to a disaster to reduce future losses and achieve greater resilience to natural hazards.

9.25.1 Hazard Mitigation Planning Team

The Township of Wantage followed the planning process described in Section 2 (Planning Process). This annex was developed over the course of several months with input from many jurisdiction representatives. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization. The coronavirus pandemic resulted in a strain on local resources that limited some participation, but every effort was made to connect with staff and stakeholders and gain diverse input. Due to safety precautions, all meetings were held virtually. The following table summarizes who participated and in what capacity. Additional documentation on the municipality's planning process through Planning Partnership meetings is included in Section 2 (Planning Process) and Appendix C (Meeting Documentation).

Table 9.25-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Joseph Konopinski, OEM Coordinator Address: 888 State Route 23, Wantage, NJ 07461 Phone Number: (973) 222-7269 Email: OEM@wantage-nj.org	Name / Title: Michael Restel, Administrator Address: 888 State Route 23, Wantage, NJ 07461 Phone Number: (973) 647-5015 Email: mike@wantagetwp-nj.org
NFIP Floodplain Administrator	
Name / Title: Harold Pellow, Engineer Address: 17 Plains Road, Augusta, NJ 07822 Phone Number: (973) 948-6463 Email: hpellow@hpellow.com	

Name	Title	Method of Participation
Joe Konopinski	OEM Coordinator	Primary point of contact, capability assessment completion; mitigation strategy development; provision of data and input on hazard rankings; member of the Steering Committee; attended the kickoff meeting, risk assessment meeting, annex training and mitigation strategy workshop
Michael Restel	Township Administrator	Alternate point of contact, capability assessment completion; mitigation strategy development; provision of data and input on hazard rankings
Harold Pellow	Engineer	NFIP Floodplain Administrator

9.25.2 Jurisdiction Profile

Wantage Township is located in northern Sussex County. The Township fully surrounds the Borough of Sussex. New York State is located to the north, the Townships of Lafayette and Hardyston are located to the south, Vernon Township is located to the east and Montague and Frankford Townships are located to the west. It has a total area of 67.5 square miles. The following unincorporated communities are located within the Township: Mount Salem, Rockport, Hanford, Colesville, Van Syckles, Quarryville, Libertyville, Plumbsock, Beemerville, Woodbourne, McCoys Corner, Lewisburg, Martins, Papakating, and Roys. The Wallkill River forms the eastern

border of the Township and its tributaries flow through the Township as well. Other streams, ponds and lakes in the Township include, but not limited to: Hanfrod Brook, Clove Brook, West Branch Papakating Creek and its tributaries, Papakating Creek, Clove Acres Lake, Lake Windsor, Lake Neepaulin, Herzenberg Lake, and Lake Rutherford.

According to the U.S. Census, the 2010 population for the Township of Wantage was 11,358. The estimated 2018 population was 11,902 a 4.4 percent decrease from the 2010 Census. Data from the 2018 U.S. Census American Community Survey indicate that 4.2 percent of the population is 5 years of age or younger and 18.2 percent is 65 years of age or older. Communities must deploy a support system that enables all populations to safely reach shelters or to quickly evacuate a hazard area.

9.25.3 Growth/Development Trends

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to understanding a jurisdiction's overall risk to its hazards of concern. Table 9.24-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. The figures at the end of this annex illustrate the geographically-delineated hazard areas and the location of potential new development.

Table 9.25-2. Recent and Expected Future Development

Type of Development	2015		2016		2017		2018		2019	
Number of Building Permits for New Construction Issued Since the Previous HMP										
	Total	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**	**Total**	**Within SFHA**
Single and Two-Family Units	7	-	3	-	2	-	3	-	8	-
Multi-Family	0	-	1	-	60	-	0	-	0	-
Other (commercial, mixed-use, etc.)	1	-	0	-	0	-	0	-	0	-

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zone(s)*	Description / Status of Development
Recent Major Development and Infrastructure from 2015 to Present					
Wantage Emergency Operations Center	Emergency Operations Center	1	888 Route 23 Wantage, NJ	Nuclear Incident Hazard Area	Complete
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
None Anticipated					

** Only location-specific hazard zones or vulnerabilities identified.*
SFHA = Special Flood Hazard Area

9.25.4 Capability Assessment

Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. The Township of Wantage performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. This section summarizes the following findings of the assessment for this jurisdiction:

- An assessment of planning, legal and regulatory capabilities

- Development and permitting capabilities
- An assessment of administrative and technical capabilities
- An assessment of fiscal capabilities
- An assessment of education and outreach capabilities
- Information on NFIP compliance
- The community's adaptive capacity for the impacts of climate change
- Classification under various community mitigation programs

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, planning/policy documents were reviewed, and each jurisdiction was surveyed to obtain a better understanding of their progress in plan integration. Areas with current mitigation integration are summarized below. The Township of Wantage identified specific integration activities that will be incorporated into municipal procedures; these actions are included in the updated mitigation strategy.

Planning, Legal and Regulatory Capability

The table below summarizes the legal and regulatory tools that are available to the Township of Wantage and where hazard mitigation has been integrated.

Table 9.25-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Codes, Ordinances, & Requirements					
Building Code	Yes	State & Local	Yes	Yes	-
Comment: • *State mandated on local level under NJAC 5:23-3.14. International Building Code – New Jersey Edition, 2018, NJAC 5:24-3.14 Adopted 9/3/2019* • *The Township's code (Chapter 8) follows State Uniform Construction Code Act (N.J.S. 52:27D-119 Et Seq.). The code includes maintenance standards that requires buildings to be kept free from hazards .*					
Zoning Code	Yes	Local	Yes – if municipality has a Planning Board	Yes	-
Comment: • *State permissive on local level. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976, 40-55D-62: 49. Power to zone, requires all jurisdictions to have current zoning and other land development ordinances after the planning board has adopted the land use element and master plan.* • *This code is found in Chapter 13 of the municipal code and was adopted in 1979.* • *The general intent of the code is to establish a precise and detailed plan for the use of land in the township based on the master plan for Wantage Township and enacted in order to promote and to protect the public health, safety, morals, comfort, convenience and the general welfare. This chapter is intended to regulate the use of land within zoning districts, promote orderly development, regulate intensity of use and the location of buildings, establish standards of development, prohibit incompatible uses, regulate the alteration of existing buildings, limit congestion in the roads, protect against hazards, and conserve the taxable value of land, and generally to promote the purposes of zoning as set forth.* • *The Township has a floodplain district that prohibits filling, draining, constructing levees and bulkheads, or improving land to eliminate or reduce flooding or erosion.* • *When updating the Zoning Ordinance, the Township will recognize hazard areas as limits on changes to zoning within the municipality.*					
Subdivisions	Yes	Local – Land Use Board	Yes – if municipality has a	Yes	-

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
			Planning Board		
Comment: • *P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval a. The governing body may by ordinance require approval of subdivision plats by resolution of the planning board as a condition for the filing of such plats with the county recording officer and approval of site plans by resolution of the planning board as a condition for the issuance of a permit for any development, except that subdivision or individual lot applications for detached one or two dwelling-unit buildings shall be exempt from such site plan review and approval; provided that the resolution of the board of adjustment shall substitute for that of the planning board whenever the board of adjustment has jurisdiction over a subdivision or site plan pursuant to subsection 63b. of this act . Dictated by the Municipal Land Use Law. NJ Statute 40:27-6.2 - the board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section.* • *The land subdivision code (Chapter 12) provides the rules, regulations and standards to guide land subdivision in the township in order to promote the public health, safety, convenience and general welfare of the township. When reviewing subdivision applications, the Land Use Board will look for floodplains and wetlands. When submitting an application, the property owner must show flood hazard areas, steep slopes, and natural terrain features.*					
Stormwater Management	Yes	Local	Yes	Yes	-
Comment: • *See Title 7 of the NJ Administrative Code, N.J.A.C. 7:8* • *This ordinance was adopted in 3/30/06 and is found in Chapter 14a of the municipal code. The purpose of the code is to establish minimum stormwater management requirements and controls for major development.*					
Post-Disaster Recovery	No	-	No	-	-
Comment:					
Real Estate Disclosure	No	State, Division of Consumer Affairs	Yes	-	-
Comment: *N.J.A.C. 13:45A-29.1 - Before signing a contract of sale, all purchasers must receive a New Jersey Public Offering Statement (POS) approved by the New Jersey Real Estate Commission. The POS provides information such as estimated completion dates for improvements, fees for services and amenities, the type of title and ownership interest being offered, its proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.*					
Growth Management	Yes	Local	Yes – if municipality has a Planning Board	No	-
Comment: • *State Mandated on a municipal level. See Zoning Ordinance ; Also - Plan Endorsement Process via the State Development & Redevelopment Plan provides for the delineation of Growth Areas and Environs; Use of the endorsed plans in the implementation of state environmental regulations makes the Plan Endorsement process a growth management strategy.* • *These ordinances were adopted in 1979 and found in Chapter 13 (Zoning) of the municipal code.* • *The Governing Body is responsible for these ordinances in compliance with the Zoning Ordinance.*					
Site Plan Review	Yes	Local – Land Use Board	Yes – if municipality has a Planning Board	Yes	-
Comment: • *Dictated by the Municipal Land Use Law which sets forth minimum requirements for plans, etc., timeframes for development review. NJ Statute 40:27-6.2: The board of freeholders of any county having a county planning board shall provide for the review of all subdivisions of land within the county by said county planning board and for the approval of those subdivisions affecting county road or drainage facilities as set forth and limited hereinafter in this section. 40:27-6.10 In order that county planning boards shall have a complete file of the planning and zoning ordinances of all municipalities in the county, each municipal clerk shall file with the county planning board a copy of the planning and zoning ordinances of the municipality in effect on the effective date of this act and shall notify the county planning board of the introduction of any revision or amendment of such an ordinance which affects lands adjoining county roads or other county lands, or lands lying within 200 feet of a municipal boundary, or proposed facilities or public lands shown on the county master plan or official county map. Such notice shall be given to the county planning board at least 10 days prior to the public hearing thereon by personal delivery or by certified mail of a copy of the official notice of the public hearing together with a copy of the proposed ordinance.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
• *In the Township, site plan review and approval is required before any change of use, or before any excavation, removal of soil, clearing of a site or placing of any fill on lands contemplated for development, and, except as hereinafter provided, no building permit shall be issued for any building or use, or reduction or enlargement in size or other alteration of any building or change in use of any building including accessory structures unless a site plan is first submitted and approved by the reviewing board and no certificate of occupancy shall be given unless all construction and development conform to the plans as approved by the reviewing board.* • *The Land Use Board is responsible for these requirements.*					
Environmental Protection	No	-	No	-	-
Comment:					
Flood Damage Prevention	Yes	Federal, State & Local	Yes	Yes	2021-Wantage-004
Comment: • *The NJ State Law Flood Area Control Act (N.J.S.A. 58:16A-52) and the National Flood Control Act of 1968 (NFIP) are state and federal acts to support minimization of flood losses. They do not require local adoption but as enforced by the NJDEP, the floodplain ordinances of each municipality must be reviewed for compliance with these regulations. In addition, participation in the NFIP requires a floodplain ordinance. Regulations for the Flood Control Hazards Act were adopted in 2007 and amended effective June 20, 2016.* • *The Township Engineer is responsible for this ordinance in compliance with Chapter 18- Flood Damage Prevention. The code requires a development permit before any construction or development begins, including placement of manufactured homes, within any area of special flood hazard. Any new construction or substantial improvements in the SFHA must have their lowest floor elevated to or above the BFE. For non-residential construction, they can either elevate to the BFE or floodproof areas below the BFE.* • *The Township's current flood damage prevention ordinance was last adopted in 2011. It currently does not have a freeboard requirement and does not meeting New Jersey's minimum requirement.*					
Wellhead Protection	No	-	No	-	-
Comment:					
Emergency Management	Yes	Local	No	No	-
Comment: • *Adopted February 7th, 2019- Local Plan*					
Climate Change	No	-	No	-	-
Comment:					
Disaster Recovery Ordinance	No	-	No	-	-
Comment:					
Disaster Reconstruction Ordinance	No	-	No	-	-
Comment:					
Other:	No	-	-	-	-
Comment:					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	No	-
Comment: • *2018 Revised NJ Statute 40:27-2; the county planning board shall make and adopt a master plan for the physical development of the county. The master plan of a county, with the accompanying maps, plats, charts, and descriptive and explanatory matter, shall show the county planning board's recommendations for the development of the territory covered by the plan, and may include, among other things, the general location, character, and extent of streets or roads, viaducts, bridges, waterway and waterfront developments, parkways, playgrounds, forests, reservations, parks, airports, and other public ways, grounds, places and spaces; the general location and extent of forests, agricultural areas, and open-development areas for purposes of conservation, food and water supply, sanitary and drainage facilities, or the protection of urban development, and such other features as may be important to the development of the county. The county planning board shall encourage the co-operation of the local municipalities within the county in any matters whatsoever which may concern the integrity of the county master plan and to advise the board of chosen freeholders with respect to the formulation of development programs and budgets for capital expenditures. Per State of NJ Municipal Land Use Law (MLUL) L. 1975, s. 2, eff Aug 1, 1976 40:55D-28 provides the required*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
components of a municipal Master Plan and requires that each municipality prepare a master plan and update it every 6 years. Further, all zoning ordinances must be consistent with the Master Plan or will not be benefitted from a presumption of validity. • *The Master Plan Reexamination Report for Wantage Township was adopted on October 24, 2009.*					
Capital Improvement Plan	Yes	Local	No	Yes	-
Comment: • *The 2020 budget included the 6-year capital program (2020 to 2025) for the Township. It included line items for capital improvement funds, improvements to roads, purchase of emergency equipment, improvements to parks, and drainage improvements.*					
Disaster Debris Management Plan	In progress	Local	No	-	2021-Wantage-005
Comment:					
Floodplain or Watershed Plan	Yes	Local	No	Yes	-
Comment: *The Governing Body is responsible for this plan, which was adopted on 9/8/11, in compliance with Ordinance 2011-08.*					
Stormwater Management Plan	Yes	Local	Yes	Yes	-
Comment: • *The Stormwater Management rules (N.J.A.C. 7:8) rules were published in the February 2, 2004 NJ Register. These rules set forth the required components of regional and municipal stormwater management plans and establish the stormwater management design and performance standards for new (proposed) development. The design and performance standards for new development include groundwater recharge, runoff quantity controls, and runoff quality controls. The rules emphasize, as a primary consideration, the use of nonstructural stormwater management techniques including minimizing disturbance, minimizing impervious surfaces, minimizing the use of stormwater pipes, preserving natural drainage features, etc. The rules also set forth requirements for groundwater recharge, stormwater runoff quantity control, stormwater runoff quality control, and the prohibition of major development to be located within or to discharge runoff from the major development into a 300-foot riparian zone without prior authorization from the Department under the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13.* • *This plan was adopted on 3/8/05.* • *The Governing Body is responsible for this plan in compliance with Stormwater Management Plan.*					
Stormwater Pollution Prevention Plan	Yes	Local	Yes	Yes	-
Comment: • *The Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program (NJPDES) rules (N.J.A.C. 7:14A) were published in the February 2, 2004, NJ Register. These NJPDES rules are intended to address and reduce pollutants associated with existing stormwater runoff. The NJPDES rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These NJPDES rules govern the issuance of permits to entities that own or operate small municipal separate storm sewer systems, known as MS4s. Under this program, permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); implementing solids and floatables control; locating discharge points and stenciling catch basins; and a public education component.*					
Urban Water Management Plan	No	-	No	-	-
Comment:					
Habitat Conservation Plan	No	-	No	-	-
Comment:					
Economic Development Plan	No	-	No	-	-
Comment:					
Shoreline Management Plan	No	-	Yes – if located in a coastal zone	-	-
Comment: • *NJ Coastal Area Facility Review Act (N.J.S.A. 13:19) or CAFRA regulates almost all development along the coast for activities including construction, relocation, and enlargement of buildings or structures, and excavation, grading, shore protection structures, and site preparation. This law is implemented through NJ's Coastal Zone management Rules N.J.A.C. 7:7E-1 et seq.*					

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	Is this State Mandated?	Have aspects of the HMP been integrated into your codes/ordinances/plans?	
				If yes- how? Describe in comments.	If no - add Mitigation Action #, if applicable.
Community Wildfire Protection Plan	No-NJFFS	-	No	-	-
Comment:					
Community Forest Management Plan	No	-	No	-	-
Comment:					
Transportation Plan	Yes	Local	No	No	-
Comment: *The Land Use Board is responsible for this plan, which was adopted in 2014, in compliance with the Master Plan.*					
Agriculture Plan	No	-	No	-	-
Comment:					
Climate Action Plan	No	-	No	-	-
Comment:					
Tourism Plan	No	-	No	-	-
Comment:					
Business Development Plan	Yes- Committee (MP)	Local	No	No	-
Comment:					
Other: Open Space Plan	Yes	Local	No	Yes	-
Comment: • *This plan was adopted in March of 2008.* • *The Governing Body is responsible for this plan in compliance with the Open Space Plan.*					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes	-
Comment: • *Each county and municipality in the State shall prepare a written Emergency Operations Plan with all appropriate annexes necessary to implement the plan. Each Emergency Operations Plan shall be adopted no later than one year after the State Emergency Planning Guidelines have been adopted by the State Office of Emergency Management and shall be evaluated at such subsequent scheduled review of the State Emergency Operations Plan. L.1989, c.222, s.19.* • *This plan was rewritten and adopted in 2019.* • *The Office of Emergency Management is responsible for this plan in compliance with the Emergency Management Plan.*					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	No	-	-
Comment:					
Post-Disaster Recovery Plan	Yes	Local	No	Yes	-
Comment: *The Office of Emergency Management is responsible for this plan, which was adopted in 2014, in compliance with the Emergency Management Plan.*					
Continuity of Operations Plan	No	-	No	-	-
Comment:					
Public Health Plan	No	-	No	-	-
Comment:					
Other	No	-	No	-	-
Comment:					

Table 9.25-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits? - If no, who does? If yes, which department?	Yes, Building Department
Does your jurisdiction have the ability to track permits by hazard area?	Yes
Does your jurisdiction have a buildable lands inventory? -If yes, please describe briefly. -If no, please quantitatively describe the level of buildout in the jurisdiction.	No- lots of undeveloped. But no large scale development, limited by location. No one putting into large scale.

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Wantage.

Table 9.25-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	The Township's Land Use Board considers the impact on the community when development of land is proposed. The board will make recommendations to stay in compliance with the existing township ordinances.
Mitigation Planning Committee	No	-
Environmental Board / Commission	Yes	Wantage Township Clean Communities Program
Open Space Board / Committee	Yes	The Township has an Open Space Committee that is made up of six committee members.
Economic Development Commission / Committee	No	Currently inactive
Warning Systems / Services (mass notification system, outdoor warning signals)	Yes	The Township utilizes their website to post news and announcements. The Township also uses Facebook to post weather alerts and news. Wantage Township OEM also uses Facebook to post weather alert and emergency notifications. The Township also has an electronic message board outside of municipal hall. Through County OEM, residents can use Swift911 to sign up for emergency alerts.
Maintenance program to reduce risk	No	-
Mutual aid agreements	Yes	Public Safety
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Land Use Board
Engineers or professionals trained in building or infrastructure construction practices	Yes	Land Use Board
Planners or engineers with an understanding of natural hazards	Yes	Land Use Board
Staff with training in benefit/cost analysis	Yes	Finance
Staff with training in green infrastructure	Yes	Harold Pellow
Staff with education/knowledge/training in low impact development	Yes	Harold Pellow
Surveyor	No	-
Stormwater engineer	Yes	Contract- Pellow and Associates
Personnel skilled or trained in GIS applications	No	-
Local or state water quality professional	Yes	County

Staff/Personnel Resource	Available?	Department/Agency/Position
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	Emergency Management
Watershed planner	Yes	Contract- Pellow and Associates
Environmental specialist	Yes	Harold Pellow (wetlands)
Grant writers	No	-
Resilience Officer	No	-
Other: NFIP Floodplain Administrator	Yes	Township Engineer
Other: Professionals trained in conducting damage assessments	Yes	Administration

Fiscal Capability

The table below summarizes financial resources available to the Township of Wantage.

Table 9.25-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes Administrator
Capital Improvements Project Funding	Yes, Engineer, CFO
Authority to Levy Taxes for Specific Purposes	No
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes, Governing Body
Incur Debt through Special Tax Bonds	Yes, Governing Body
Incur Debt through Private Activity Bonds	No
Withhold Public Expenditures in Hazard-Prone Areas	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	No
Other: Open Space Acquisition Funding Programs	Yes, Governing Body

Education and Outreach Capability

The table below summarizes the education and outreach resources available to the Township of Wantage.

Table 9.25-7. Education and Outreach Capabilities

Criterion	Response
Do you have a public information officer or communications office?	Yes
Do you have personnel skilled or trained in website development?	Yes
Do you have hazard mitigation information available on your website? -If yes, briefly describe.	No
Do you use social media for hazard mitigation education and outreach? -If yes, briefly describe.	Yes – both the Township and the Township OEM use Facebook to provide weather updates and emergency alerts.
Do you have any citizen boards or commissions that address issues related to hazard mitigation? -If yes, briefly describe.	No
Do you have any other programs already in place that could be used to communicate hazard-related information? If yes, briefly describe.	No

Community Classifications

The table below summarizes the classifications for community programs available to the Township of Wantage.

Table 9.25-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (Fire ISO Protection Class)	No	-	-
Storm Ready Certification	No	-	-
Firewise Community Classification	No	-	-
Sustainable Jersey	Yes	Not certified	Joined program on 11/11/2010

Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2014). In other words, it describes a jurisdiction's current ability to adjust to, protect from, or withstand a hazard event. This term is often discussed in reference to climate change; however, adaptive capacity also includes an understanding of local capacity for adapting to current and future risks and changing conditions. The table below summarizes the adaptive capacity for each hazard and the jurisdiction's rating.

Table 9.25-9. Adaptive Capacity

Hazard	Adaptive Capacity (Capabilities) - Strong/Moderate/Weak
Dam Failure	Weak
Disease Outbreak	Weak
Drought	Moderate
Earthquake	Moderate
Flood	Weak
Geologic	Weak
Hazardous Materials	Moderate
Hurricane and Tropical Storm	Moderate
Invasive Species	Strong
Nor'Easter	Strong
Severe Weather	Strong
Severe Winter Weather	Strong
Wildfire	Strong

Notes:
Strong = Capacity exists and is in use; Moderate = Capacity may exist, but is not used or could use some improvement;
Weak = Capacity does not exist or could use substantial improvement; Unsure = Not enough information is known to assign a rating.

National Flood Insurance Program

This section provides specific information on the management and regulation of the regulatory floodplain.

Table 9.25-10. National Flood Insurance Program Compliance

Criterion	Response
What local department is responsible for floodplain management?	Engineer
Who is your floodplain administrator? (name, department/position)	Harold Pellow, Engineer
Are any certified floodplain managers on staff in your jurisdiction?	No
What is the date that your flood damage prevention ordinance was last amended?	2011
Does your floodplain management program meet or exceed minimum requirements? -If exceeds, in what ways?	The program meets minimum requirements set by FEMA and the State. §18-5.2 of the municipal code lists specific standards for residential and non-residential construction. For residential, new construction or substantial improvements in the SFHA must have the lowest floor elevated at or above the BFE. Non-residential construction (new or substantial improvements) must be elevated to the BFE or be floodproofed.
When was the most recent Community Assistance Visit or Community Assistance Contact?	December 14, 1993
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? -If so, state what they are.	No
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what they are.	No
Do your flood hazard maps adequately address the flood risk within your jurisdiction? -If no, state why.	Yes
Does your floodplain management staff need any assistance or training to support its floodplain management program? - If so, what type of assistance/training is needed?	The FPA would consider attending continuing education and/or certification trainings on floodplain management if it were offered in the County.
Does your jurisdiction participate in the Community Rating System (CRS)? -If yes, is your jurisdiction interested in improving its CRS Classification? -If no, is your jurisdiction interested in joining the CRS program?	No
How many flood insurance policies are in force in your jurisdiction?* -What is the insurance in force? -What is the premium in force?	14 policies
How many total loss claims have been filed in your jurisdiction?* -How many claims are still open or were closed without payment? -What were the total payments for losses?	10 claims $180,963 in payments
Do you maintain a list of properties that have been damaged by flooding?	No, but if there were flood damages, the community would maintain lists/inventories.
Do you maintain a list of property owners interested in flood mitigation?	No

**According to FEMA statistics as of October 13, 2020*
Reference: FEMA 2020

Additional Areas of Existing Integration

- The Township conducts all-hazards public education and outreach program for their residents. This is done through their website and Facebook page.

- Through site plan reviews and Develop specific design guidelines and development review procedures for new construction, replacement, relocation and substantial improvement in hazard areas within the Township.
- The Township will incorporate the 2021 HMP risk assessment and hazard mitigation principles into comprehensive planning efforts and day-to-day operations of the Township.

Opportunities for Future Integration

- **Firewise Program:** The Township will follow the proper steps in applying for and becoming a Firewise community. This includes forming a board/committee, obtaining a wildfire risk assessment, developing an action plan, and hosting outreach events and programs. The application will be completed online (2021-Wantage-003).
- **Flood Damage Prevention Ordinance Update:** The Township will update its flood damage prevention ordinance to meet the New Jersey requirement of one foot of freeboard (2021-Wantage-004).
- **Disaster Debris Management Plan:** The Township will develop a debris management plan that will assist the municipality when they need to facilitate response and recovery after a debris-causing incident. The plan will provide direction to facilitate and coordinate the management of debris following a disaster (2021-Wantage-005).

9.25.5 Hazard Event History Specific to the Jurisdiction

Sussex County has a history of hazard events, as detailed in Section 4 (Risk Assessment) of this plan. A summary of historical events is provided in each of the hazard profiles in Section 4.3 (Hazards of Concern) and includes a chronology of events that affected Sussex County and its jurisdictions. The Township of Wantage's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Sussex County. Table 9.24-11 provides details regarding municipal-specific loss and damages the jurisdiction experienced during hazard events. Information provided in the table below is based on reference material or local sources.

Table 9.25-11. Hazard Event History

Date(s) of Event	Event Type (disaster declaration if applicable)	Sussex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22, 2016 - January 24, 2016	DR-4264: Severe Winter Storm and Snowstorm	Yes	A major nor'easter, produced record snowfall and blizzard conditions in parts of New Jersey on January 23rd and 24th.	Road closure; trees down
January 20, 2020 and continuing	EM-3451, DR-4488: COVID-19 Pandemic	Yes	The coronavirus pandemic resulted in the need for shutdowns and social distancing and mask requirements.	Tax revenue, permits PPE supplies
August 4, 2020	Tropical Storm Isaias (declaration number pending)	Yes	Tropical Storm Isaias brought heavy rain to western New Jersey. Rainfall totals were as high as 3 to 5.5 inches. Observations from surrounding areas suggest sustained tropical storm force winds likely occurred.	Power loss /down. FEMA application still in process. (Under $123,000- probably $35K). Time for tree clearance, road closures, power outages. Power out for 2-3 days. Ran generators at town and firehouses. Vehicles

Source: FEMA 2020, NOAA NCEI 2020

9.25.6 Jurisdiction-Specific Vulnerabilities and Hazard Ranking

The hazard profiles in Section 4 (Risk Assessment) provide detailed information regarding each plan participant's vulnerability to the identified hazards. Refer to Section 4.2 (Methodology and Tools) and Section 4.4 (Hazard Ranking) for a detailed summary for the Township of Wantage risk assessment results and data used to determine the hazard ranking discussed later in this section.

Hazard Area Extent and Location

Hazard area extent and location maps were generated for the Township of Wantage that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps have been generated only for those hazards that can be clearly identified using mapping techniques and technologies and for which the Township of Wantage has significant exposure.

Repetitive Flood Losses

The following summarizes the repetitive and severe repetitive flood losses in the Township of Wantage.

- Number of repetitive loss (RL) properties: 0
- Number of severe repetitive loss (SRL) properties: 0
- Number of RL/SRL properties that have been mitigated: 0

Source: FEMA 2019
Note: The number of SRL properties excludes RL properties.

Critical Facilities and Lifelines

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplain.

Table 9.25-12. Critical Facilities and Lifelines Flood Exposure

Name	Type	Exposure	
		1% Event	0.2% Event
22-166 Herzenberg Dam	Dam	X	X

Source: Sussex County Planning Partnership 2020
*Note: *Identified lifeline*

Identified Issues and Problem Areas

The jurisdiction has identified the community surrounding Lake Neepaulin as an area with frequently downed trees due to severe storms.

Hazard Ranking

This section summarizes the jurisdiction's primary hazards of concern based on identified problems, impacts and the results of the risk assessment as presented in Section 4 (Risk Assessment). The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property, and the economy; community capability and changing future climate conditions. This input supports the development of mitigation actions, targeting those hazards with the highest level of concern.

As discussed in Section 4.4 (Hazard Ranking), each plan participant may have differing degrees of risk exposure and vulnerability compared to Sussex County as a whole. Therefore, the Township of Wantage ranked each

hazard's degree of risk as it pertains to their community factoring in their capabilities to withstand impacts and rebound after the event. The table below summarizes the hazard rankings of potential hazards for the Township of Wantage. The Township of Wantage has reviewed the Sussex County hazard ranking table and has provided input to its individual results to reflect the relative risk of the hazards of concern to the community. During the review of the hazard ranking, the Township of Wantage indicated the following reasons why hazard rankings have changed since the 2016 HMP:

- The climate has increased the risk for wildfires in the Township since 2016.

Table 9.25-13. Township of Wantage Hazard Ranking

Dam Failure	Disease Outbreak	Drought	Earthquake	Flood	Geologic
Low	Low	Medium	Medium	Low	Low

Hazardous Materials	Hurricane and Tropical Storm	Invasive Species	Nor'Easter	Severe Weather	Severe Winter Weather	Wildfire
Medium	Medium	High	High	High	High	Medium

9.25.7 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and provides action prioritization.

Past Mitigation Initiative Status

The following table summarizes the jurisdiction's progress on their mitigation strategy identified in the 2016 HMP. Actions that are carried forward as part of this plan update are included in Table 9.24-15 and Table 9.24-16 with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and can also be found under 'Capability Assessment' presented previously in this annex.

Table 9.25-14. Status of Previous HMP Mitigation Actions

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update? Check if Yes	Include in the 2021 HMP Update? Enter 2021 HMP Action #
Wantage-1 (new)	Ensure continuity of operations through back up power at critical facilities: purchase and install generators.	Township OEM	Completed (2 fire companies) using a FEMA mitigation grant ($50,000).	-	-
Wantage-2 (old #2)	Implement Fire Wise Program throughout the Township.	Township OEM	No Progress	X	2021-Wantage-003
Wantage-3 (old #3)	Conduct all-hazards public education and outreach program for hazard mitigation and preparedness. Place an article in the Municipal newsletter and update the municipal website linking to the County HMP page	Township OEM with support from County OEM	Ongoing Capability	-	-
Wantage-4 (new)	Develop specific design guidelines and development	Township Administrator	Ongoing capability	-	-

2016 Action Number	Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2021 HMP Update? Check if Yes	Include in the 2021 HMP Update? Enter 2021 HMP Action #
	review procedures for new construction, replacement, relocation and substantial improvement in hazard areas within the Township.				
Wantage-5 (new)	When updating the Zoning Ordinance, the Township will recognize hazard areas as limits on changes to zoning within the municipality.	Township Administrator	Ongoing Capability	-	-
Wantage-6 (new)	Review the county HMP during the next update of the Township Master Plan.	Township Administrator	Ongoing Capability	-	-
Wantage-7 (new)	Incorporate risk assessment and hazard mitigation principles into comprehensive planning efforts and day-to-day operations of the Township.	Township Administrator	Ongoing Capability	-	-

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Township of Wantage participated in a risk assessment workshop in October 2020 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Township of Wantage participated in a mitigation action workshop in November 2020 and was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Sussex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; mitigation funding sources, and the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 *Selecting Appropriate Mitigation Measures for Floodprone Structures* (March 2007) and FEMA *Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards* (January 2013). Section 6 (Mitigation Strategy) and Appendix F (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.24-15 summarizes the comprehensive-range of specific mitigation initiatives the Township of Wantage would like to pursue in the future to reduce the effects of hazards. Initiatives are dependent upon available funding (grants and local match availability) and can be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6 (Mitigation Strategy), 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing actions as *High*, *Medium*, or *Low*. The table below summarizes the evaluation of each mitigation initiative, listed by action number.

Table 9.24-16 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update.

Table 9.25-15. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Wantage-001	Backup Generator at Municipal Hall	**Problem**: The Wantage Township Town Hall is located at 888 State Highway 23. It serves as the town hall, EMS, and EOC. The existing generator is in need of replacement as it is reaching its life expectancy. Without a functioning generator, the town hall will not be able to function or operate during emergency situations. **Solution:** Working with the Township Engineer, identify the proper size generator for the town hall. Once identified, purchase and install a permanent generator.	Existing	All	2, 3, 6	Township Administration, OEM	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Township Budget	Continuity of operations to critical facilities and lifelines	$125,000	Within 2 years	High	SIP	PP, ES
2021-Wantage-002	PPE Stockpile	**Problem**: During the current COVID-19 pandemic, the Township did not have an adequate supply of personal protective equipment (PPE) for municipal staff. Without proper PPE, it puts municipal staff and residents at risk to the spread of infectious diseases. **Solution:** The Township will purchase PPE to create a stockpile for municipal staff. This will include gloves, masks, gowns, antibacterial handwash, antiviral cleaning solutions, sanitizers, and misters.	N/A	Disease Outbreak	1, 2, 3, 6	Township OEM	BRIC, NJDCA, Township Budget, FEMA Assistance to Firefighters Grant	Increase protection from diseases; decrease risk of spread	$50,000	Within 2 years	High	LPR	PR, ES

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
2021-Wantage-003	Firewise Program	**Problem**: The national Firewise USA® recognition program provides a collaborative framework to help neighbors in a geographic area get organized, find direction, and take action to increase the ignition resistance of their homes and community and to reduce wildfire risks at the local level. The Township is currently not part of the Firewise program. **Solution:** The Township will follow the proper steps in applying for and becoming a Firewise community. This includes forming a board/committee, obtaining a wildfire risk assessment, developing an action plan, and hosting outreach events and programs. The application will be completed online.	Both	Wildfire	1, 2, 3, 4, 5	Township OEM and Fire Department	Township Budget, Staff Time	Helps Township identify wildfire safety efforts; access to funding and assistance	$10,000+	Within 5 years	Medium	LPR, EAP	PI, ES
2021-Wantage-004	Update Flood Damage Prevention Ordinance	**Problem**: The Township's current flood damage prevention ordinance was last adopted in 2011. It currently does not have a freeboard requirement and does not meeting New Jersey's minimum requirement. **Solution:** The Township will update its flood damage prevention ordinance to meet the	New and Existing	Flood	1, 2	Township Administration, Engineer	Township budget, FEMA BRIC	Meet state standards, reduce future flood risk	Staff time	6 months	High	LPR	PR

Initiative Number	Mitigation Initiative Name	Description of the Problem and Solution	New or Existing Assets?	Hazard(s) to be Mitigated	Goals Met	Lead and Support Agencies	Potential Funding Sources	Estimated Benefits	Estimated Cost	Timeline	Priority	Mitigation Category	CRS Category
		New Jersey requirement of one foot of freeboard.											
2021-Wantage-005	Develop Debris Management Plan	**Problem**: The Township currently does not have an adopted debris management plan. Without a plan in place, there are no identified resources in place to properly address debris and do not have identified locations for debris storage. **Solution:** The Township will develop a debris management plan that will assist the municipality when they need to facilitate response and recovery after a debris-causing incident. The plan will provide direction to facilitate and coordinate the management of debris following a disaster.	Existing	All hazards	3, 5, 6	OEM, Public Works	Township budget	Increased disaster capability and preparedness	Staff time	1 year	High	LPR	ES

Notes:

Acronyms and Abbreviations:

CAV	*Community Assistance Visit*
CRS	*Community Rating System*
DPW	*Department of Public Works*
FEMA	*Federal Emergency Management Agency*
FPA	*Floodplain Administrator*
HMA	*Hazard Mitigation Assistance*
N/A	*Not applicable*
NFIP	*National Flood Insurance Program*
OEM	*Office of Emergency Management*

Potential FEMA HMA Funding Sources:

FMA	*Flood Mitigation Assistance Grant Program*
HMGP	*Hazard Mitigation Grant Program*
BRIC	*Building Resilient Infrastructure and Communities*

Timeline:
The time required for completion of the project upon implementation

Cost:
The estimated cost for implementation.

Benefits:
A description of the estimated benefits, either quantitative and/or qualitative.

Mitigation Category:

- *Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.*
- *Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.*

- *Natural Systems Protection (NSP) – These are actions that minimize damage and losses and preserve or restore the functions of natural systems.*

- *Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.*

CRS Category:

- *Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.*
- *Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.*
- *Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.*
- *Natural Resource Protection (NR) - Actions that minimize hazard loss and preserve or restore the functions of natural systems. Actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.*
- *Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.*
- *Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.*

Table 9.25-16. Summary of Evaluation and Action Priorities

Initiative Number	Mitigation Initiative Name	Life Safety	Property Protection	Cost Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
2021-Wantage-001	Backup Generator at Municipal Hall	1	1	1	1	1	1	0	0	0	1	1	1	1	0	10	High ⚠
2021-Wantage-002	PPE Stockpile	1	0	1	1	1	1	0	0	1	1	0	1	1	1	10	High
2021-Wantage-003	Firewise Program	1	1	1	1	1	0	1	0	0	1	0	1	0	0	8	Medium
2021-Wantage-004	Update Flood Damage Prevention Ordinance	1	1	1	1	1	1	1	0	0	1	0	1	0	0	9	High
2021-Wantage-005	Develop Debris Management Plan	1	1	1	1	1	1	0	0	0	1	1	1	1	0	10	High

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).

⚠ *This action has been identified as being of highest importance to the municipality and an action that the municipality would like to complete as soon as funding is received.*

Table 9.25-17. Analysis of Mitigation Actions by Hazard and Category

Hazard	Prevention	Property Protection	Public Education and Awareness	Natural Resource Protection	Emergency Services	Structural Projects	Climate Resilient	Community Capacity Building
Dam Failure		X			X	X		X
Disease Outbreak	X	X	X		X	X		X
Drought		X			X	X		X
Earthquake		X			X	X		X
Flood	X	X			X	X	X	X
Geologic		X			X	X		X
Hazardous Materials		X			X	X		X
Hurricane and Tropical Storm		X			X	X		X
Invasive Species		X			X	X		X
Nor'Easter		X			X	X		X
Severe Weather		X			X	X		X
Severe Winter Weather		X			X	X		X
Wildfire		X	X		X	X		X

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

high ranked hazard

ORANGE medium ranked hazard

YELLOW low ranked hazard

Figure 9.25-1. Township of Wantage Hazard Area Extent and Location Map 1

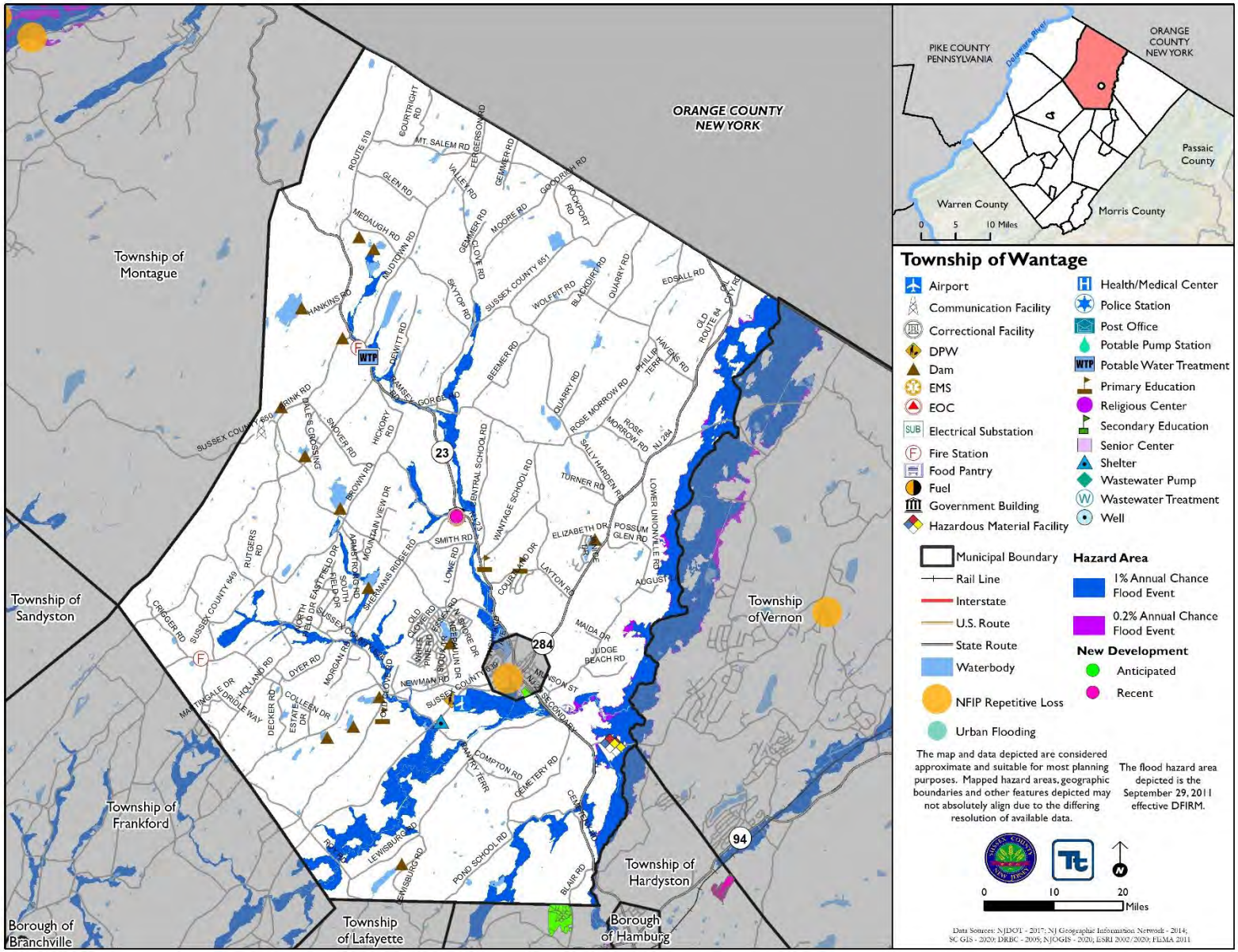


Figure 9.25-2. Township of Wantage Hazard Area Extent and Location Map 2

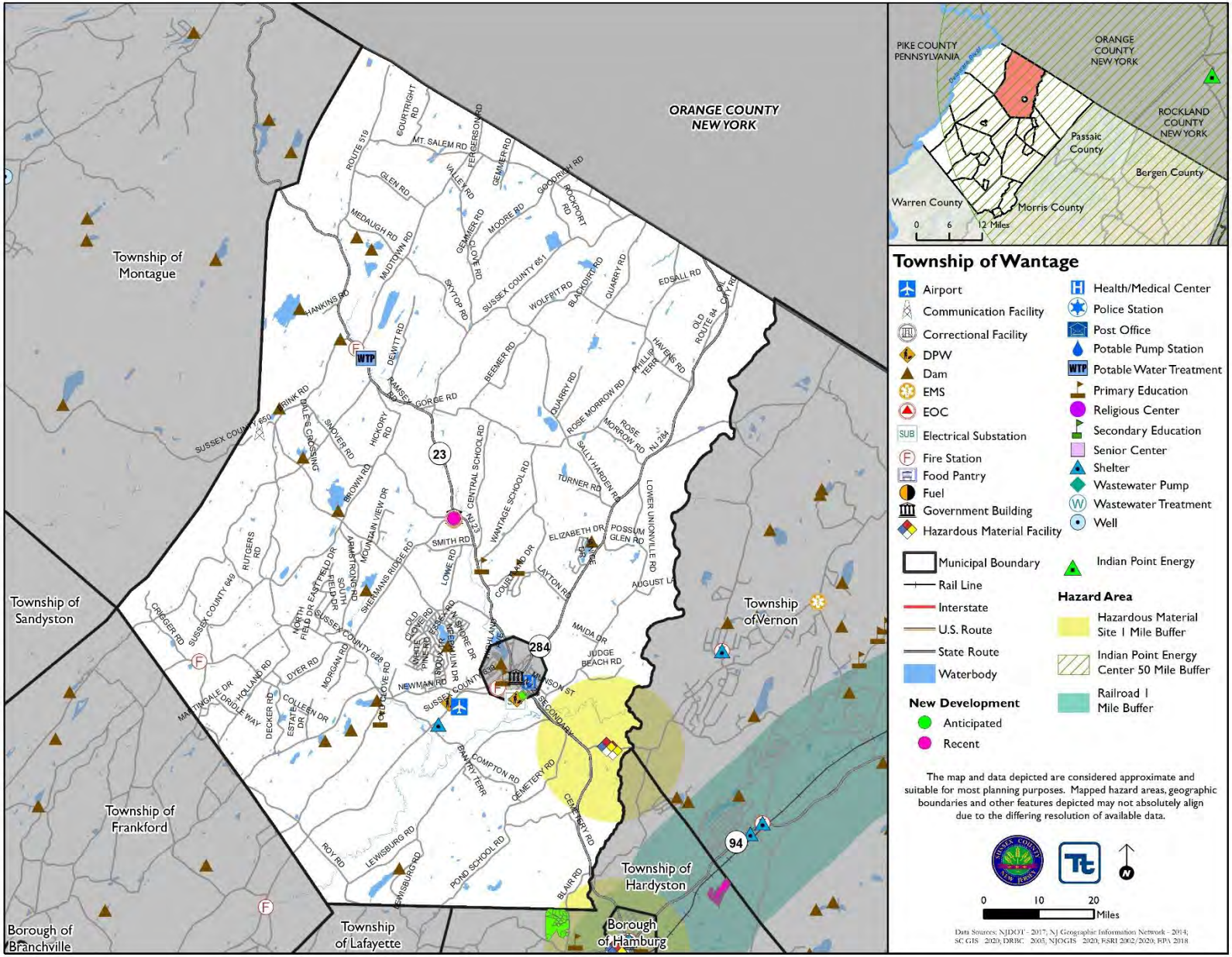
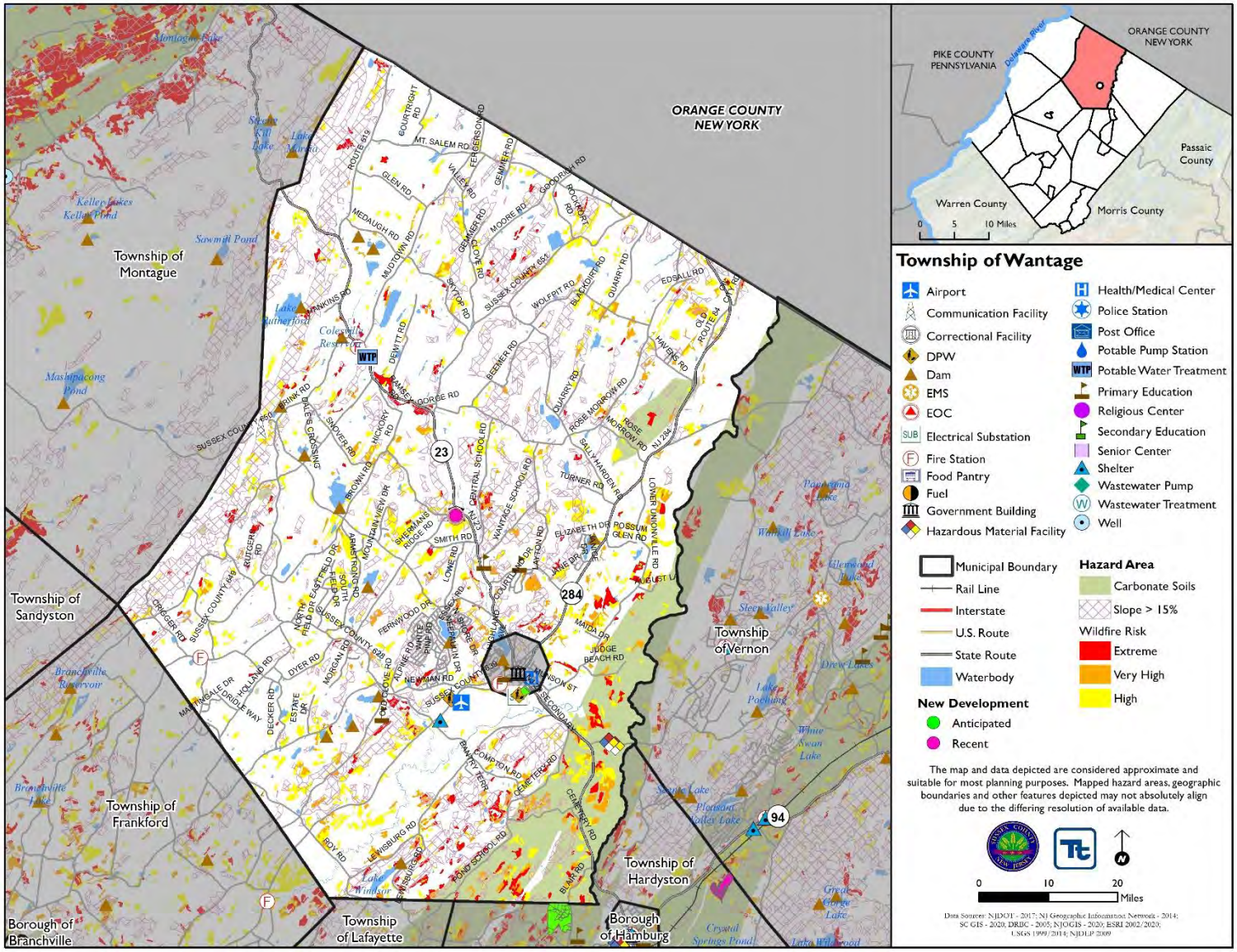


Figure 9.25-3 Township of Wantage Hazard Area Extent and Location Map 3



Action Worksheet			
Project Name:	Backup Generator at Municipal Hall		
Project Number:	2021-Wantage-001		
Risk / Vulnerability			
Hazard(s) of Concern:	All		
Description of the Problem:	The Wantage Township Town Hall is located at 888 State Highway 23. It serves as the town hall, EMS, and EOC. The existing generator is in need of replacement as it is reaching its life expectancy. Without a functioning generator, the town hall will not be able to function or operate during emergency situations.		
Action or Project Intended for Implementation			
Description of the Solution:	Working with the Township Engineer, identify the proper size generator for the town hall. Once identified, purchase and install a permanent generator.		
Is this project related to a Critical Facility or Lifeline?	Yes ☒	No ☐	
Level of Protection:	N/A	**Estimated Benefits (losses avoided):**	Continuity of operations to critical facilities and lifelines
Useful Life:	5 years	**Goals Met:**	2, 3, 6
Estimated Cost:	$125,000	**Mitigation Action Type:**	Structure and Infrastructure Project
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 2 years
Estimated Time Required for Project Implementation:	Within 2 years	**Potential Funding Sources:**	FEMA HMGP and BRIC, USDA Community Facilities Grant Program, Emergency Management Performance Grants (EMPG) Program, Township Budget
Responsible Organization:	Township Administration, OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Install solar panels on roof of town hall	$20,000+	Weather dependent; maintenance costs
	Install wind turbine	$10,000+	Weather dependent; maintenance costs

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	Backup Generator at Municipal Hall	
Project Number:	2021-Wantage-001	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Provide continuity of operations and emergency services to residents
Property Protection	1	Protect building from damages associated with power outages; provide continuity of operations
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	The Township has jurisdiction to implement this project
Fiscal	0	Need grant funding
Environmental	0	No environmental impacts
Social	0	No social impacts
Administrative	1	The Township has the administrative capabilities to implement this project
Multi-Hazard	1	All hazards
Timeline	1	To be completed within 2 years
Agency Champion	1	
Other Community Objectives	0	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	PPE Stockpile		
Project Number:	2021-Wantage-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Disease Outbreak		
Description of the Problem:	During the current COVID-19 pandemic, the Township did not have an adequate supply of personal protective equipment (PPE) for municipal staff. Without proper PPE, it puts municipal staff and residents at risk to the spread of infectious diseases.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will purchase PPE to create a stockpile for municipal staff. This will include gloves, masks, gowns, antibacterial handwash, antiviral cleaning solutions, sanitizers, and misters.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	PPE	**Estimated Benefits (losses avoided):**	Increase protection from diseases; decrease risk of spread
Useful Life:	Supply needs to be replaced after use	**Goals Met:**	1, 2, 3, 6
Estimated Cost:	$50,000	**Mitigation Action Type:**	Local Plans and Regulations
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 2 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	BRIC, NJDCA, Township Budget, FEMA Assistance to Firefighters Grant
Responsible Organization:	Township OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Shut down during disease outbreak events	N/A	Loss of continuity of operations
	Rely on county/state/federal distribution	$0	Supply not guaranteed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	PPE Stockpile	
Project Number:	2021-Wantage-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protects life from disease outbreak
Property Protection	0	
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require funding support.
Environmental	0	
Social	1	Project would help protect families from disease outbreak events
Administrative	1	
Multi-Hazard	0	Disease Outbreak
Timeline	1	
Agency Champion	1	OEM
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	

Action Worksheet			
Project Name:	PPE Stockpile		
Project Number:	2021-Wantage-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Disease Outbreak		
Description of the Problem:	During the current COVID-19 pandemic, the Township did not have an adequate supply of personal protective equipment (PPE) for municipal staff. Without proper PPE, it puts municipal staff and residents at risk to the spread of infectious diseases.		
Action or Project Intended for Implementation			
Description of the Solution:	The Township will purchase PPE to create a stockpile for municipal staff. This will include gloves, masks, gowns, antibacterial handwash, antiviral cleaning solutions, sanitizers, and misters.		
Is this project related to a Critical Facility or Lifeline?	Yes ☐	No ☒	
Level of Protection:	PPE	**Estimated Benefits (losses avoided):**	Increase protection from diseases; decrease risk of spread
Useful Life:	Supply needs to be replaced after use	**Goals Met:**	1, 2, 3, 6
Estimated Cost:	$50,000	**Mitigation Action Type:**	Local Plans and Regulations
Plan for Implementation			
Prioritization:	High	**Desired Timeframe for Implementation:**	Within 2 years
Estimated Time Required for Project Implementation:	1 year	**Potential Funding Sources:**	BRIC, NJDCA, Township Budget, FEMA Assistance to Firefighters Grant
Responsible Organization:	Township OEM	**Local Planning Mechanisms to be Used in Implementation if any:**	Hazard Mitigation, Emergency Management

Three Alternatives Considered (including No Action)			
Alternatives:	**Action**	**Estimated Cost**	**Evaluation**
	No Action	$0	Current problem continues
	Shut down during disease outbreak events	N/A	Loss of continuity of operations
	Rely on county/state/federal distribution	$0	Supply not guaranteed

Progress Report (for plan maintenance)	
Date of Status Report:	
Report of Progress:	
Update Evaluation of the Problem and/or Solution:	

Action Worksheet		
Project Name:	PPE Stockpile	
Project Number:	2021-Wantage-002	
Criteria	**Numeric Rank (-1, 0, 1)**	**Provide brief rationale for numeric rank when appropriate**
Life Safety	1	Protects life from disease outbreak
Property Protection	0	
Cost-Effectiveness	1	Cost-effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	The Township has the legal authority to conduct the project.
Fiscal	0	Project will require funding support.
Environmental	0	
Social	1	Project would help protect families from disease outbreak events
Administrative	1	
Multi-Hazard	0	Disease Outbreak
Timeline	1	
Agency Champion	1	OEM
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	