



9.16 BOROUGH OF NORTH CALDWELL

This section presents the jurisdictional annex for the Borough of North Caldwell. The annex includes a general overview of the Borough of North Caldwell; an assessment of the Borough of North Caldwell'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 hazards.

9.16.1 Hazard Mitigation Planning Team

The following individuals are the Borough of North Caldwell's identified HMP update primary and alternate points of contact and NFIP Floodplain Administrator.

Table 9.16-1. Hazard Mitigation Planning Team

Primary Point of Contact	Alternate Point of Contact
Name / Title: Kevin O'Sullivan, Borough Administrator Address: 141 Gould Avenue, North Caldwell NJ 07006 Phone Number: 973-228-6412 Email: kosullivan@northcaldwell.org	Name / Title: John D'Ascensio, OEM Coordinator Address: 141 Gould Avenue, North Caldwell NJ 07006 Phone Number: 973-477-0051 Email: jderif@gmail.com
NFIP Floodplain Administrator	
Name / Title: Paul Milani, Construction Code Official Address: 141 Gould Avenue, North Caldwell NJ 07006 Phone Number: 973-228-6410 Email: pmilani@northcaldwell.org	

9.16.2 Jurisdiction Profile

The land of North Caldwell was originally part of a tract of land known as Horseneck in 1701. The Borough of North Caldwell was incorporated in 1898. Well known for its beautiful homes, wooded roads, and healthy climate, the area is known as the "Denver of the East" (Borough of North Caldwell New Jersey, 2014).

North Caldwell operates using the Mayor and Council government set-up (Borough of North Caldwell New Jersey, 2014). According to the U.S. Census Bureau, the Borough has a total land area of 3.016 square miles, of which 3.011 square miles is land and 0.005 square miles is water.

According to the U.S. Census, the 2010 population for the Borough of North Caldwell was 6,183. The estimated 2017 population was 6,637, a 7.3 percent increase from the 2010 Census. Data from the 2017 U.S. Census American Community Survey indicate that 2.4 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.

9.16.3 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 9.16-2 summarizes recent and expected future development trends, including major residential/commercial development and major infrastructure development. Figure 9.16-1 and Figure 9.16-2 at the end of this annex



illustrates the geographically-delineated hazard areas and the location of potential new development, where available.

Table 9.16-2. Recent and Expected Future Development

Type of Development	2014	2015	2016	2017	2018
Number of Building Permits for New Construction Issued Since the Previous HMP					
Single Family					
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 and Mitigation if located in Hazard Zone
Recent Major Development and Infrastructure from 2015 to Present					
Hilltop by Pulte Homes	Single Family Homes	About 65	Hilltop Drive, Sagamore Drive, Harvest Lane	-	Ongoing
Hilop by RPM	Affordable Housing Townhouses	-	Sagamore Drive	-	Ongoing
Four Seasons North Caldwell	Adult Living Townhouses	-	Hilltop Drive, Four Seasons Drive	-	Near Completion
Hidden Ridge	Townhouses	-	Summit Drive	-	Near Completion
Falcon Point	Single Family Homes	-	Falcon Point Drive	-	Near Completion
Known or Anticipated Major Development and Infrastructure in the Next Five (5) Years					
Not Available.	-	--	-	-	-

* Only location-specific hazard zones or vulnerabilities identified.

9.16.4 Capability Assessment

The Borough of North Caldwell performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Section 5 (Capability Assessment) describes the components included in the capability assessment and their significance for hazard mitigation planning. This section summarizes the following findings of the assessment:

- 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 National Flood Insurance Program (NFIP) compliance.
- Classification under various community mitigation programs.
- The community's adaptive capacity for the impacts of climate change.



Areas that mitigation is currently integrated are summarized in Capability Assessment (subsection 9.X.4). The Borough of North Caldwell identified specific integration activities that will be incorporated into municipal procedures 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 North Caldwell.

Table 9.16-3. Planning, Legal and Regulatory Capability

	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Codes, Ordinances, & Requirements					
Building Code	Yes	Local and State	Yes	Yes/No	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. Chapter 34 of the municipal code.					
Zoning Code	Yes	Local and State	Yes	Yes/No	Yes/No
Comment: 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. Chapter 107 of the municipal code.					
Subdivisions	Yes	Local and State	Yes	Yes/No	Yes/No
Comment: State mandated - P.L.1975, c.291 (C.40:55D-47): 40:55D-37. Grant of power; referral of proposed ordinance; county planning board approval . 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 107 – Section 33-41.					
Stormwater Management	Yes	Local	Yes	Yes/No	Yes/No
Comment: Title 7 of the NJ Administrative Code (N.J.A.C. 7:8). Chapter 53 of the municipal code.					
Post-Disaster Recovery	No	-	-	-	-
Comment:					
Real Estate Disclosure	Yes	State – Division of Consumer Affairs	Yes	Yes/No	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 proximity to hospitals, schools, fire and police, as well as any hazards, risks or nuisances in or around the subdivision.					
Growth Management			Yes	Yes/No	Yes/No
Comment: State mandated at local level. Chapter 107 (Elements within Chapter 107) of the municipal code, Redevelopment Plan.					
Shoreline Development	No	-	Yes – if coastal community	-	-
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.					
Site Plan Review	Yes	Local	Yes	Yes/No	Yes/No
Comment: Chapter 107-33 (Environmental Design, Site Plan Review) of the municipal code. Environmental design and site plan for new constructions is required to assure the preservation and enhancement of natural features and environmental conditions, to preclude the creation of traffic flow or traffic safety problems and to maximize efforts to assure each property owner the right to safe and comfortable enjoyment of					



	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Environmental Protection	No		Yes		
<i>Comment: The rules that are utilized by the NJDEP and other environmental agencies are codified at Title 7 of the NJ Municipal Administrative Code.</i>					
Flood Damage Prevention	Yes	Local	No	Yes/No	Yes/No
<i>Comment: Ord. No. 14-87, Ord. No. 12-07. Administered by the floodplain administrator.</i>					
Wellhead Protection	No	-	-	-	-
<i>Comment:</i>					
Emergency Management	Yes	Local	-	-	-
<i>Comment: Chapter 3, Article XVIII (Administration of Gov't) of the municipal code outlines the duties, powers, and responsibilities of the Emergency Management Coordinator, Deputy Emergency Management Coordinator, and the use of the National Incident Management System (NIMS) during incident management within the Borough of North Caldwell.</i>					
Climate Change	No	-	-	-	-
<i>Comment:</i>					
Disaster Recovery Ordinance	No	-	-	-	-
<i>Comment:</i>					
Disaster Reconstruction Ordinance	No	-	-	-	-
<i>Comment:</i>					
Other	No	-	-	-	-
<i>Comment:</i>					
Planning Documents					
Comprehensive / Master Plan	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment: Master Plan Re-Examination Finished 2019, Pending Adoption in August 2019</i>					
Capital Improvement Plan	Yes	Local	Allowed	Yes/No	Yes/No
<i>Comment: Per NJSA 40:55D-29 the governing body is authorized to direct the planning board to prepare a CIP with at least a six year planning horizon. Capital Improvement Planning performed with annual budget.</i>					
Disaster Debris Management Plan	No		No	Yes/No	Yes/No
<i>Comment:</i>					
Floodplain or Watershed Plan	No		No	Yes/No	Yes/No
<i>Comment:</i>					
Stormwater Management Plan	Yes	Local and State	Yes	Yes/No	Yes/No
<i>Comment: Per NJDEP Storm Water Management Rule (N.J.A.C. 7:8, et seq.). The Municipal Stormwater Regulation Program was developed in response to the U. S. Environmental Protection Agency's (USEPA) Phase II rules published in December 1999. The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from Tier A and Tier B municipalities, as well as public complexes, and highway agencies that discharge stormwater from municipal separate storm sewers (MS4s). Annually updated and submitted with NJDEP, 04/2019.</i>					
Stormwater Pollution Prevention Plan	Yes	Local and State	Yes	Yes/No	Yes/No
<i>Comment:</i>					
Urban Water Management Plan	No		No	No	-
<i>Comment:</i>					



	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Habitat Conservation Plan	No		No	No	-
<i>Comment:</i>					
Economic Development Plan	No		No	No	-
<i>Comment:</i>					
Shoreline Management Plan	No		No	No	-
<i>Comment:</i>					
Community Wildfire Protection Plan	No		No	No	-
<i>Comment:</i>					
Community Forest Management Plan	No		No	No	-
<i>Comment:</i>					
Transportation Plan	No		No	No	-
<i>Comment:</i>					
Agriculture Plan	No		No	No	-
<i>Comment:</i>					
Climate Action Plan	No		No	No	-
<i>Comment:</i>					
Tourism Plan	No		No	No	-
<i>Comment:</i>					
Business Development Plan	Yes		No	No	-
<i>Comment: Elements of business development are discussed within the Borough of North Caldwell Master Plan</i>					
North Caldwell Redevelopment Plan	Yes	Local	No	No	-
<i>Comment:</i>					
Response/Recovery Planning					
Comprehensive Emergency Management Plan (CEMP) / Emergency Operations Plan (EOP)	Yes	Local	Yes	Yes/No	Yes/No
<i>Comment: Per the NJ Civilian Defense and Disaster Control Act (App.A:9_43.2) Counties and municipalities must have written Emergency Operations Plans to be reviewed every 2 years. Approval and signoff in 2018</i>					
Threat & Hazard Identification & Risk Assessment (THIRA)	No	-	-	-	-
<i>Comment: A risk assessment was performed in 2001 to identify threats and hazards around the Borough.</i>					
Post-Disaster Recovery Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Continuity of Operations Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					
Public Health Plan	No	-	No	Yes/No	Yes/No
<i>Comment:</i>					



	Do you have this? (Yes/No)	Authority that enforces (Federal, State, Regional, County, Local)	State Mandated / Allowed	Has the HMP been integrated in the last 5 years? If yes- how?	
				If yes- how? Describe in comments	If no - can it be a mitigation action? If yes, add Mitigation Action #.
Other	No	-	No	Yes/No	Yes/No
Comment:					

Table 9.16-4. Development and Permitting Capability

Criterion	Response
Does your jurisdiction issue development permits?	Yes, Construction Code Office
- If no, who does? If yes, which 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, near capacity but most likely would have been assessed as part of affordable housing study.

ADMINISTRATIVE AND TECHNICAL CAPABILITY

The table below summarizes potential staff and personnel resources available to the Borough of North Caldwell.

Table 9.16-5. Administrative and Technical Capabilities

Staff/Personnel Resource	Available?	Department/Agency/Position
Administrative Capability		
Planning Board	Yes	Planning Board / Zoning Board of Adjustment
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	Nixle, Reverse 911
Maintenance program to reduce risk	Yes	Vegetation Management, Catch-basin cleaning, Hydrant flushing, Detention Basins
Mutual aid agreements	Yes	Surrounding Communities, County
Technical/Staffing Capability		
Planners or engineers with knowledge of land development and land management practices	Yes	Borough Engineer (Consultant), Borough Administrator
Engineers or professionals trained in building or infrastructure construction practices	Yes	Borough Engineer (Consultant), Borough Administrator, Construction Code Official
Planners or engineers with an understanding of natural hazards	Yes	Borough Engineer (Consultant), Borough Administrator, Construction Code Official
Staff with training in benefit/cost analysis	No	-



Staff/Personnel Resource	Available?	Department/Agency/Position
Staff with training in green infrastructure	Yes	Borough Engineer (consultant)
Staff with education/knowledge/training in low impact development	Yes	Borough Engineer (consultant)
Surveyors	Yes	Borough Engineer (consultant)
Stormwater engineer	Yes	Borough Engineer (consultant)
Personnel skilled or trained in GIS applications	Yes	Some technical knowledge exists, but infrastructure cataloged within GIS.
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	OEM
Grant writers	Yes	Engineering/Department Heads
Resilience Officer	No	-
Watershed planner	Yes	Borough Engineer (consultant)
Environmental specialist	Yes	Health Officer
Other	No	-

FISCAL CAPABILITY

The table below summarizes financial resources available to the Borough of North Caldwell.

Table 9.16-6. Fiscal Capabilities

Financial Resource	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes- Generally doesn't meet grant req's
Capital Improvements Project Funding	Yes - Finance
Authority to Levy Taxes for Specific Purposes	Yes - Mayor and Council
User Fees for Water, Sewer, Gas or Electric Service	Yes (Water and Sewer)
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	Yes/No
Clean Water Act 319 Grants (Nonpoint Source Pollution)	-
Other	

EDUCATION AND OUTREACH CAPABILITY

The table below summarizes the education and outreach resources available to the Borough of North Caldwell.

Table 9.16-7. 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?	Yes
Do you have hazard mitigation information available on your website? • If yes, briefly describe.	No



Criterion	Response
Do you use social media for hazard mitigation education and outreach? • If yes, briefly describe.	Yes; Nixle alerts, website, 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.	Yes, Nixle alerts, website, Facebook
Do you have any established warning systems for hazard events? • If yes, briefly describe.	Yes, Lightning Detection System

COMMUNITY CLASSIFICATIONS

The table below summarizes the classifications for community programs available to the Borough of North Caldwell.

Table 9.16-8. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System	NP	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Yes/No	-	-
Public Protection (Fire ISO Protection Class)	Yes	4	2014
Storm Ready Certification	NP	-	-
Firewise Community Classification	NP	-	-

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 climate change and the jurisdiction’s rating.

Table 9.16-9. Adaptive Capacity of Climate Change

Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Coastal Erosion and Sea Level Rise	Low
Coastal Storms (<i>hurricanes/tropical storms, nor'easters, coastal erosion, and storm surge</i>)	Medium
Drought	Medium
Earthquake	Low
Extreme Temperature	High
Flood (<i>riverine / flash flood, SLR</i>)	Medium
Geological Hazards (<i>landslides and subsidence/sinkholes</i>)	Medium
Severe Weather (<i>high wind, tornado, TSTM, and hail</i>)	Medium
Severe Winter Weather (<i>heavy snow, blizzards, and ice storms</i>)	High



Hazard	Adaptive Capacity (Capabilities) - High/Medium/Low
Wildfire	Medium
Civil Disorder	Medium
Cyber Attack	High
Disease Outbreak	Low
Economic Collapse	Low
Hazardous Substances	Medium
Utility Interruption	Medium
Terrorism	Medium
Transportation Failure	Medium

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 9.16-10. 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)	Paul Milani, Construction Code 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?	January 2020
Does your floodplain management program meet or exceed minimum requirements? • If exceeds, in what ways?	Yes
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; Was included in the 2018 Hackensack-Passaic Watershed, 02030103 Flood Risk Report
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?	No
<input type="checkbox"/> If so, what type of assistance/training is 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?*	Flood insurance policies: 32 Insurance in force: \$9,526,000 Premium in force: \$17,528
How many total loss claims have been filed in your jurisdiction?*	Total loss claims: 23
• How many claims are still open or were closed without payment? • What were the total payments for losses?	Claims still open or closed without payment: 8



Criterion	Response
	Total payments for losses: \$121,188
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 03/31/2019

ADDITIONAL AREAS OF EXISTING INTEGRATION

Planning Board: The North Caldwell Planning Board is comprised of 9 voting members including the Mayor and Borough Administrator. The Borough's Engineer and Planning Board Attorney are always in attendance. The Board hears applications in the Borough dealing with the following; Major and Minor Subdivisions, Site Plan Waivers, Preliminary and Final Site Plans. The primary responsibilities of the Planning Board are to:

- Make, adopt and amend the Master Plan of the Borough of North Caldwell
- Administer Subdivisions of land and site plan reviews
- Provide input and recommendations to the Borough Council on land use ordinances.

Engineering Department: The Borough Engineer is responsible for all municipal engineering and design, the preparation of plans and specifications for projects authorized by the Mayor and Council and the preparation of preliminary designs and cost estimates for proposed improvements. The engineer prepares contracts, attends the opening of sealed bids, completes contracts with successful bidders, checks bonds and insurance policies, supervises construction progress and inspections, and certifies estimates for payment. The Borough Engineer is also the Director of Public Works and the Borough's licensed water and sewer operator.

Building Department: The Building Department has numerous functions including, but not limited to:

- Issuing building permits for construction, demolition, remodeling of and repair of structures upon the approval of applications for same.
- Issuing permits for signs, air-conditioning, oil burners and oil tanks.
- Performing inspections for and issuing certificates of occupancy.
- Investigating complaints of violations of Borough codes and ordinances dealing with building, zoning and property maintenance.

The Building Department enforces the provisions of the Uniform Construction Code, the Borough Property Maintenance Code and such other codes as may be required to be enforced within the Borough. The present BOCA (Basic Building Code) was adopted by ordinance in 1977 along with a National Plumbing Code and the New Jersey Uniform Construction Code with ongoing updates approved on a regular bases by the State of New Jersey. Maintenance Code covers all buildings and property. Enforcement of these codes helps prevent the deterioration of buildings throughout and Borough. Proper occupancy standards of all buildings are maintained to preserve the residential atmosphere of the Borough and the general welfare of the citizens. Permits are required for almost all building and renovating, moreover, all contractors and landscapers must be licensed with the State of New Jersey.

Division of Zoning Enforcement: The Zoning Officer is responsible for supervising all building activity and operations within the Borough for the purpose of insuring compliance with Chapter 107 "Zoning and Land Use" of the Code of the Borough of North Caldwell. Applications for variances from the zoning ordinance are heard by the Board of Adjustment. The Board of Adjustment consists of seven members and two alternates, each of whom is



appointed by the Mayor and Council for a term of four years. The Board conducts regularly scheduled hearings after public notice.

Public Works: Borough matters relating to streets, water, sewers, parks, buildings and grounds and general maintenance are under the authority of the Department of Public Works.

Placeholder for areas of additional integration regarding committees/departments that tie to mitigation capability

Sustainable Essex Alliance: The Sustainable Essex Alliance (SEA) is a coalition of local municipal green teams and sustainability organizations working together to create solutions for local environments and economies. By operating as a single entity, the SEA has the opportunity to not only impact more environments, but also achieve more efficient results than we could alone. This helps to create the financial incentives needed to push sustainable actions such as reducing greenhouse gas emissions, using green energy solutions, and cutting waste while simultaneously increasing awareness and education in our communities. The Alliance is currently pursuing a renewable community energy aggregation program to provide residents of Essex County with the option of 100% green energy. The Alliance has also initiated the NJ Home Performance with ENERGYSTAR™ Program and Comfort Partners Program that offer rebates and financing for energy efficiency upgrades, insulation, and helpful assessments to reduce bills and environmental impact.

9.16.5 Hazard Event History Specific to the Jurisdiction

Essex 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 4.4 (Hazard Profiles) and includes a chronology of events that affected Essex County and its jurisdictions. The Borough of North Caldwell's history of federally-declared (as presented by FEMA) and significant hazard events (as presented in NOAA-NCEI) is consistent with that of Essex County. Table 9.16-11 provides details regarding municipal-specific loss and damages the Borough experienced during hazard events from 2014 to 2019. 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)	Essex County Designated?	Summary of Event	Summary of Local Damages and Losses
January 22-23, 2016	Winter Storm, Blizzard (DR-4264)	Yes	Low pressure moving across the deep South on Thursday January 21st and Friday January 22nd intensified and moved off the Mid Atlantic coast on Saturday January 23rd, bringing heavy snow and strong winds to northeast New Jersey, and blizzard conditions to the urban corridor and some nearby areas.	-

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. Table 9.16-2 summarizes the risk assessment results for the Borough of North Caldwell used to determine the hazard ranking.



In an attempt to summarize the confidence level regarding the input utilized to populate the hazard ranking, a gradient of certainty was developed. A certainty factor of high, medium or low was selected and assigned to each hazard to provide a level of transparency and increased understanding of the data utilized to support the resulting ranking. The following scale was used to assign a certainty factor to each hazard:

- High—Defined scenario/event to evaluate; probability calculated; evidenced-based/quantitative assessment to estimate potential impacts through hazard modeling.
- Moderate—Defined scenario/event or only a hazard area to evaluate; estimated probability; combination of quantitative (exposure analysis, no hazard modeling) and qualitative data to estimate potential impacts.
- Low—Scenario or hazard area is undefined; there is a degree of uncertainty regarding event probability; majority of potential impacts are qualitative.

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Table 9.16-12. Summary of Risk Assessment Results

Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
Coastal Erosion and Sea Level Rise	Coastal Erosion Hazard Area (CEHA):	CEHA:	0	CEHA:	0	CEHA:	\$0	High
		SLR +1ft:	0	SLR +1ft:	0	SLR +1ft:	\$0	
	Sea Level Rise: NOAA +1ft and +3ft rise	SLR +3ft:	0	SLR +3ft:	0	SLR +3ft:	\$0	
Coastal Storm	100- and 500- MRP Hurricane Wind Category 1 through Category 4 SLOSH	Category 1:	92	Category 1:	19	100-year Wind Loss:	\$3,381,110	High
		Category 2:	951	Category 2:	197			
		Category 3:	2,229	Category 3:	462	500-year Wind Loss:	\$16,934,187	
		Category 4:	2,595	Category 4:	533			
Drought	Drought event	Majority of the County is serviced by water suppliers with surface water sources.		Droughts are not expected to cause direct damage to buildings.		Losses would be limited, due to lack of major agricultural industry.		Low
Earthquake	100, 500-, 2,500- Year Mean Return Period Event	NEHRP D&E:	2,368	NEHRP D&E:	504	100-year Loss:	\$0	High
		Liquefaction Class 4:	179	Liquefaction Class 4:	37	500-year Loss:	\$4,616,521	
						2,500-year Loss:	\$71,094,612	
Extreme Temperature	Extreme temperature event (heat or cold)	Over 65 Population:	4,600	Physical impacts due to extreme temperatures would be limited.		Loss of business function is possible due to unexpected repairs (i.e. pipes bursting) or utility interruptions.		Low
		Population Below Poverty Level:	3,515					
Flood	100- and 500-Year Mean Return Period Event	100-year	716	100-year	152	100-year Loss:	\$269,142,437	High
		500-year	1,606	500-year	545			
Geological		Class A:	0	Class A:	0	Class A:	0	Moderate



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population		Buildings		Economy (Loss)		Certainty Factor
	High Landslide Susceptibility Areas	Class B:	5	Class B:	1	Class B:	\$359,884	
Severe Weather	Severe Weather Event	Entire population exposed; The degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		Economic losses could be similar to those of the coastal storm (wind and surge) and flooding hazards.		Low
Severe Winter Weather	Severe Winter Weather Event	Entire population exposed; The degree of impact to the population depends on the scale of the incident.		Entire building stock is exposed; The degree of impact depends on the scale of the incident.		The cost of snow and ice removal and repair of roads can impact local operating budgets.		Low
Wildfire	Wildfire Fuel Hazard areas (High, Very High, Extreme)	Wildfire:	0	Wildfire:	0	Wildfire:	\$0	Moderate
Civil Disorder	Civil disorder event	Population in the immediate vicinity will be impacted.		Buildings in the immediate vicinity will be most impacted.		Economic assets in the immediate vicinity will be most impacted.		Low
Cyber Attack	Cyber-attack event	The degree of impact to the population depends on the scale of the incident.		Damages due to a cyber attack may be limited.		The degree of damages depends on the scale of the incident. Loss of utilities/communication would have widespread economic impacts.		Low
Disease Outbreak	An outbreak of one of the diseases evaluated	Entire population exposed; The degree of impact to the population depends on the scale of the incident		Disease outbreak would not have a direct impact on buildings.		Impacts to food supply and water supply; Costs of activities and programs implemented to address outbreaks and prevent spread.		Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Economic Collapse	Recessions, Depressions, Interruption of normal economic conditions	The degree of impact to the population depends on the scale of the incident.	Damages due to economic collapse may be limited; property owners that cannot afford to maintain the structure may become abandoned/rundown.	The degree of damages depends on the scale of the incident. Massive impacts due to loss of jobs, businesses, and tax revenue are possible.	Low
Hazardous Substances	Release of a hazardous substance whether fixed site or in-transit	Population impacted will depend on the type of material and scale of the incident. May include population within small radii of site.	The degree of damages to a building depends on the scale of the incident.	The degree of damages depends on the scale of the incident.	Low
Utility Interruption	Disruption of power or potable water caused by accident, sabotage, natural hazards, or equipment failure.	The degree of impact to the population depends on the scale of the incident.	The degree of damages to buildings depends on the scale of the incident; Physical impacts to structures may occur if utilities are keeping critical functions online (i.e. sump pumps).	The degree of damages depends on the scale of the incident.	Low
Terrorism	Terrorist Attack in the County	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to buildings depends on the scale of the incident; Buildings in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident.	Low



Hazard of Concern	Hazard/ Scenario(s) Evaluated	Population	Buildings	Economy (Loss)	Certainty Factor
Transportation Failure	One accident on any of the following: Roadway/vehicular, Aviation, Rail	The degree of impact to the population depends on the scale of the incident; Population in the immediate vicinity will be impacted.	The degree of damages to asset depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	The degree of damages depends on the scale of the incident; Assets in the immediate vicinity will be most impacted.	Low

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REPETITIVE FLOOD LOSSES

The following summarizes the repetitive and severe repetitive flood losses in the Borough of North Caldwell.

- 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

Note: The number of SRL properties excludes RL properties.

RL and SRL as of 03/31/2019; SRL includes SRL properties that have been verified only (SRL_Indicator = V).

CRITICAL FACILITIES AND LIFELINES

The table below identifies critical facilities and lifelines in the community located in the 1-percent and 0.2-percent floodplains.

Table 9.16-13. Potential Flood Losses to Critical Facilities and Lifelines

Name	Type	Exposure		Status of Mitigation
		1% Event	0.2% Event	
Walker's Pond Dam	Dam	-	X	Mitigation Actions Proposed Below

ADDITIONAL IDENTIFIED VULNERABILITIES

The jurisdiction has identified the following additional vulnerabilities within their community:

- There is increased runoff and changes to drainage patterns around the Borough.
- Increased demand on aging stormwater infrastructure and the need for additional maintenance is causing increased demand on limited manpower and budget.
- There are 3 repetitive loss properties located in the Borough. These properties have been repeatedly damaged by flooding.
- A recently acquired dam, which requires maintenance and construction to maintain.
- Consider additional flood studies throughout municipality (could be a phased project under FMA)
- There is a lack of cell coverage in certain areas.

HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps were generated for the Borough of North Caldwell 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 North Caldwell has significant exposure; refer to Figures 9.16-1 and 9.16-2. These maps also display the location of the regulatory floodplain, as well as identified critical facilities, lifelines, and RL/SRL properties within the municipality.

HAZARD RANKING

This section includes the community specific identification of the primary hazard concerns based on identified problems, impacts and the results of the risk assessment as presented in Section 4 of the plan. The ranking process involves an assessment of the likelihood of occurrence for each hazard; its potential impacts on people, property,



and the economy; and community capability and changing future climate conditions. This input supports the mitigation action development to target those hazards with 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 Essex County as a whole. Therefore, each jurisdiction ranked the degree of risk to each hazard as it pertains to their community. The table below summarizes the hazard risk/vulnerability rankings of potential hazards for the Borough of North Caldwell. During the review of the calculated hazard ranking, the Borough adjusted the calculated rankings to incorporate the perceived adaptive capacity of the community with respect to the relevant hazard and any other changes needed. The Borough of North Caldwell has reviewed the Essex County hazard ranking table, as well as 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 indicated the following:

- Changed the calculated ranking for flood from Low to Medium
- Changed the calculated ranking for geological hazards from Low to Medium
- Changed the calculated ranking for wildfire from Low to Medium
- Changed the calculated ranking for civil disorder from Low to Medium
- Changed the calculated ranking for transportation failure from Low to Medium

Table 9.16-14. Borough of North Caldwell Hazard Ranking

Coastal Erosion and Sea Level Rise	Coastal Storm	Drought	Earthquake	Extreme Temperature	Flood
Low	Low	Medium	Low	Medium	Medium

Geological Hazards	Severe Storm	Winter Storm	Wildfire	Civil Disorder	Cyber Attack
Medium	High	High	Medium	Medium	Low

Disease Outbreak	Economic Collapse	Hazardous Substances	Utility Failure	Terrorism	Transportation Failure
Low	Medium	Low	High	High	Medium

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 2015 HMP. Actions that are carried forward as part of this plan update are included in the following subsection in its own table 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. b

Table 9.16-15. Status of Previous HMP Mitigation Actions

2015 Action Number Action Description	Responsible Party	Status (In Progress, No Progress, Ongoing Capability, or Completed)	Include in the 2020 HMP Update?	
			Check if Yes	Enter 2020 HMP Action #
North Caldwell-1: Connect electric system at Community Center/DPW Building on Gould Avenue to existing generator at Police Station.	Fire Dept	Completed		
North Caldwell-2: "Obtain backup power at critical facilities to ensure continuity of operations. Specifically identified at this time: 1. North Caldwell Borough Hall/EOC generator; 2. North Caldwell Stephanie Drive pump station generator 3. North Caldwell Birch Avenue sewer pump station generator"	Borough Manager	1. Done 2. Temp. Portable Generator Used 3. Temp. Portable Generator Used		
North Caldwell-3: Provide electric backup power to Borough two way radio communication system at Skyline Drive	Borough Manager	Incomplete		
North Caldwell-4: Culvert repair in the area of Timber Drive, Deer Trail Road and Brookside Terrace. Replace and repair sections of corrugated metal pipe	Borough Engineering	Brookside Terrace is completed, Deer Trail Road and Timber Drive are not yet complete		
North Caldwell-5: Replace Fire Department Pumper Truck	Fire Dept	Completed in 2015		
North Caldwell-6: Upgrade pumping stations and add alarm systems to current Borough wide sanitary system	Borough Engineering	Budgeted for 2020		
North Caldwell-7: 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, conduct outreach/public education. Phase 2: Work with the property owners to implement selected action based on available funding from FEMA and local match availability. Specifically identified are properties in the following areas: •Grandview Avenue •Green Brook Area	Borough Engineering, FPA	Discontinue		



The Borough did not identify any other activities that were completed in addition to those in the 2015 HMP mitigation strategy.

PROPOSED HAZARD MITIGATION INITIATIVES FOR THE PLAN UPDATE

The Borough of North Caldwell participated in a risk assessment workshop in September 2019 in which detailed information was provided about assets exposed and vulnerable to the identified hazards of concern. The Borough of North Caldwell was provided a Mitigation Toolbox that included a mitigation catalog developed specifically for Essex County and its hazards of concerns; challenges and opportunities identified during the capability and risk assessments; 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 H (Mitigation Strategy Supplement) provide a more complete description of the Mitigation Toolbox and its resources.

Table 9.16-16 summarizes the comprehensive-range of specific mitigation initiatives the Borough of North Caldwell would like to pursue in the future to reduce the effects of hazards. Some of these initiatives might be previous actions carried forward for this HMP update. 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 4 FEMA mitigation action categories and the 6 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*.

Table 9.16-17 provides a summary of the prioritization of all proposed mitigation initiatives for this HMP update and Table 9.16-18 summarizes the actions by type across hazards of concern.



Table 9.16-16. Proposed Hazard Mitigation Initiatives

Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the 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-North Caldwell-001	Mitigate the Green Brook Erosion	There has been significant streambed and streambank erosion occurring along Green Brook in North Caldwell which has impacts on the County's road and utility infrastructure. The affected road leads to the West Essex Regional Middle School and High School and could affect traffic to the schools.	The Borough will work to meet with Fairfield, Essex County and the Green Brook Country Club (and any other stakeholders as identified) to develop a reasonable solution and cost sharing agreement for the streambed and bank stabilization of the Green Brook. The most feasible project will be used for grant applications to agencies such as FEMA and NJOEM.	Existing	Flood		Essex County, North Caldwell Administration, Fairfield Administration and Green Brook Country Club	County, municipal budget, HMGP	Erosion mitigated and roadway protected	TBD by selected solution	TBD by selected solution	High	NSP	NR
2020-North Caldwell-002	Harden Water Tower Infrastructure by Mitigating Power Loss and Communication Issues	The Borough's water tank on Skyline Drive is in a remote location and lacks backup power in the event of utility interruption. Further, the site does not have adequate and reliable alarms for	North Caldwell will pursue additional funding for a diesel generator to power the water tank site(including public safety communication s, pumps and water tank controls). The Borough will	Existing	Utility Failure		Borough Administration, DPW and OEM	HMGP, municipal budget	Water Tower protected from utility failure	\$50,000	1 year	High	SIP	PP



Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the 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
		communication to the Borough in a timely manner in the event of a system failure. Additionally, the site also lacks adequate security fencing.	also pursue additional funding for upgrades to a SCADA alarm system for remote monitoring and control.											
2020-North Caldwell-003	Mitigate flood-prone properties, including RL/SRL properties	Frequent flooding events have resulted in damages near Amelia Street, Mountain Avenue and Robin Hill Road. This area is residential, and these properties have been repetitively flooded as documented by paid NFIP claims.	Conduct outreach to 3 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 on Amelia Street, Mountain Avenue and	Existing	Flood, Severe Storm		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.	\$3 million	3 years	High	SIP	PP



Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the 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
			Robin Hill Road that experience frequent flooding (high risk areas).											
2020-North Caldwell-004	Drainage Study	There is increased runoff and changes to drainage patterns around the Borough.	The Borough has authorized an initial drainage study to be completed within the next few months. The results of the study will be used to determine the best feasible solution and will be implemented.		Flood, Severe Storm		<u>Borough Administration</u> , Essex County	Municipal Budget	-	-	Long	High	LPR	PR
2020-North Caldwell-005	Enhanced Stormwater Maintenance Plan	Increased demand on aging stormwater infrastructure is causing increased demand on limited manpower and budget.	Create and implement an enhanced ongoing stormwater maintenance plan to ensure drainage infrastructure and catch basins are in top condition		Flood, Severe Storm		<u>North Caldwell DPW</u>	Municipal Budget	-	-	Short	High	LPR, SIP	PR, PP
2020-North Caldwell-006	Walker's Pond Maintenance and Inspection	Dam at Walker's Pond, a recently acquired municipal property located at 400 Mountain Avenue, requires ongoing maintenance and inspection.	North Caldwell has applied for NJDEP Permits. Upon completion of dredging of Walker's Pond, further evaluation and inspection of	Existing	Flood		<u>Borough Administration</u>	Federal and State Grant Funding, Municipal Budget	-	-	Long	??	SIP, NSP	PP, NR



Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the 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
			the dam will occur to determine future maintenance activities.											
2020-North Caldwell-007	Walker's Pond Dredging and Maintenance	Walker's Pond, a recently acquired municipal property located at 400 Mountain Avenue, is overgrown and requires dredging and ongoing maintenance to ensure proper flow of stormwater infrastructure.	North Caldwell has hired a consultant to submit permit applications, and a separate consultant for construction plans. North Caldwell is pursuing HDSRF Funding through NJDEP.	Existing	All Hazards		<u>Borough Administration</u>	Federal and State Grant Funding, Municipal Budget	-	-	Long	??	SIP, NSP	PP, NR
2020-North Caldwell-008	Flooding Outreach, Study, and Mitigation	There are locations throughout North Caldwell which experience flooding.	North Caldwell will reach out residents of the Borough and seek input for areas with recurring flooding within the next 6-12 months. This feedback will be used to drive future applications for drainage studies and the implementation of the best identified alternative to reduce flood risk. (12-24	Existing	Flood		<u>Borough Administration</u>	Federal and State Grants, Municipal Budget	-	-	Long	??	LPR, SIP	PR, PP



Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the 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
			months from outreach to grant application)											
2020-North Caldwell-009	Telecommunications Improvements	There is a lack of cell coverage in certain areas of North Caldwell Borough.	Work with Essex County Sherriff's Office and other Public Service entities to work to remedy coverage gaps in telecommunication systems.		Utility Interruption		<u>Borough Administration,</u> <u>Borough IT,</u> Essex County Sherriff's Office	Federal and State Grants, County Funding, Municipal Budget	-	-	Long	??	SIP	ES
2020-North Caldwell-010	Borough Water Tank Generator	The Borough Water Tank located on Skyline Drive is in a remote location and lacks backup power in the event of utility interruption. In addition to this, the site also lacks adequate security fencing.	North Caldwell will pursue additional funding for a diesel generator to power the water tank site including public safety communications, pumps, and water tank controls.	Existing	Utility Interruption		<u>Borough Administration,</u> North Caldwell DPW, North Caldwell OEM	Federal and State Grants, Municipal Budget	-	-	Long	??	SIP	ES
2020-North Caldwell-011	SCADA Alarms	The SCADA system for pumping stations and the Radio Room at the Skyline Avenue Water Tank in North Caldwell do not have alarms, and therefore cannot provide timely information to	North Caldwell is currently pursuing cost estimates to include alarm purchase as part of municipal budget. The Borough will then purchase and install the alarms on at these facilities.	Existing	Utility Interruption		<u>North Caldwell DPW,</u> Borough Administration	Federal and State Grants, Municipal Budget	-	-	Long	??	SIP	ES



Initiative Number	Mitigation Initiative Name	Description of the Problem	Description of the 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
		DPW in the event of system failure.												

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 9.16-17. Summary of Prioritization of Actions

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-North Caldwell-001	Mitigate the Green Brook Erosion	1	1	1	1	1	0	0	1	1	1	1	1	1	0	11	High
2020-North Caldwell-002	Harden Water Tower Infrastructure by Mitigating Power Loss and Communication Issues	1	1	1	1	1	1	0	1	1	1	1	1	1	0	12	High
2020-North Caldwell-003	Mitigate flood-prone properties, including RL/SRL properties	1	1	1	1	1	1	0	1	0	0	1	0	1	1	10	High
2020-North Caldwell-003	Mitigate flood-prone properties, including RL/SRL properties																
2020-North Caldwell-004	Drainage Study																
2020-North Caldwell-005	Enhanced Stormwater Maintenance Plan																
2020-North Caldwell-006	Walker's Pond Maintenance and Inspection																
2020-North Caldwell-007	Walker's Pond Dredging and Maintenance																
2020-North Caldwell-008	Flooding Outreach, Study, and Mitigation																
2020-North Caldwell-009	Telecommunications Improvements																
2020-North Caldwell-010	Borough Water Tank Generator																

Notes: Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions.
Low (0-4), Medium (5-8), High (9-14).



Table 9.16-18. 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
Coastal Erosion and Sea Level Rise								
Coastal Storms								
Drought								
Earthquake								
Extreme Temperature								
Flood (riverine / flash flood, SLR)	2020-North Caldwell-004, 2020-North Caldwell-005, 2020-North Caldwell-008	2020-North Caldwell-003		2020-North Caldwell-001, 2020-North Caldwell-006, 2020-North Caldwell-007		2020-North Caldwell-005, 2020-North Caldwell-006, 2020-North Caldwell-007, 2020-North Caldwell-008		
Geological Hazards								
Severe Weather		2020-North Caldwell-003, 2020-North Caldwell-004						
Severe Winter Weather								
Wildfire								
Civil Disorder								
Cyber Attack								
Disease Outbreak								
Economic Collapse								
Hazardous Substances								
Utility Interruption		2020-North Caldwell-002			2020-North Caldwell-009, 2020-North Caldwell-010, 2020-North Caldwell-011	2020-North Caldwell-009, 2020-North Caldwell-010, 2020-North Caldwell-011		
Terrorism								
Transportation Failure								

Note: Section 6 (Mitigation Strategy) provides for an explanation of the mitigation categories.

9.16.8 Staff and Local Stakeholder Involvement in Annex Development

The Borough of North Caldwell 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 following table summarizes who participated and in what capacity. In addition, several municipal representatives were asked to review and contribute to the draft annex as documented on the annex sign-off sheets in Appendix B (Participation Documentation). 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 9.16-19. Contributors to the Annex

Entity	Title	Method of Participation
Kevin O'Sullivan	Borough Administrator	Primary POC, provided impact data, contributed to the mitigation strategy
John D'Ascensio	OEM Coordinator	Alternate POC; attended meetings; provided information to update the annex including impacts and updated mitigation actions

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Figure 9.16-1. Borough of North Caldwell Hazard Area Extent and Location Map

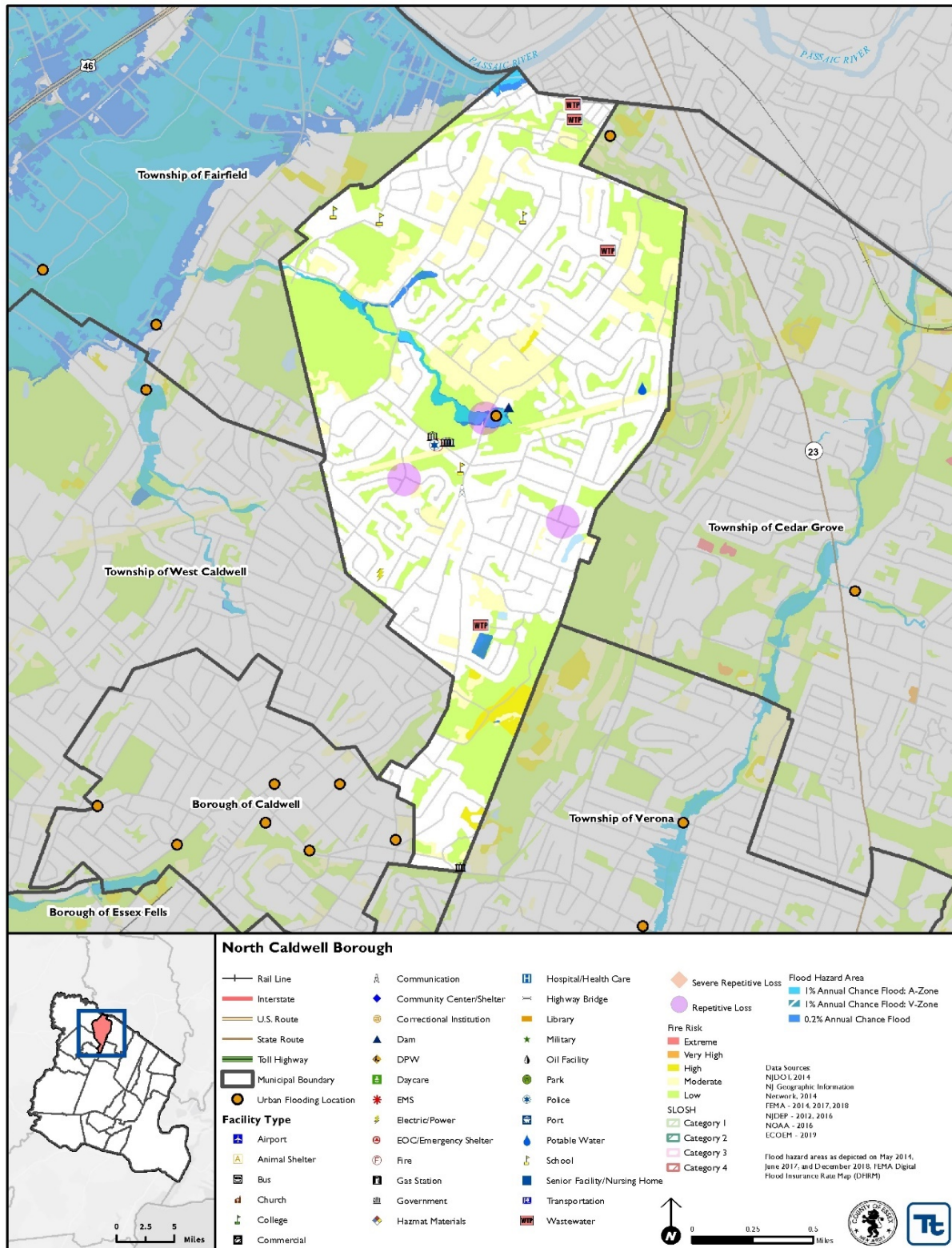
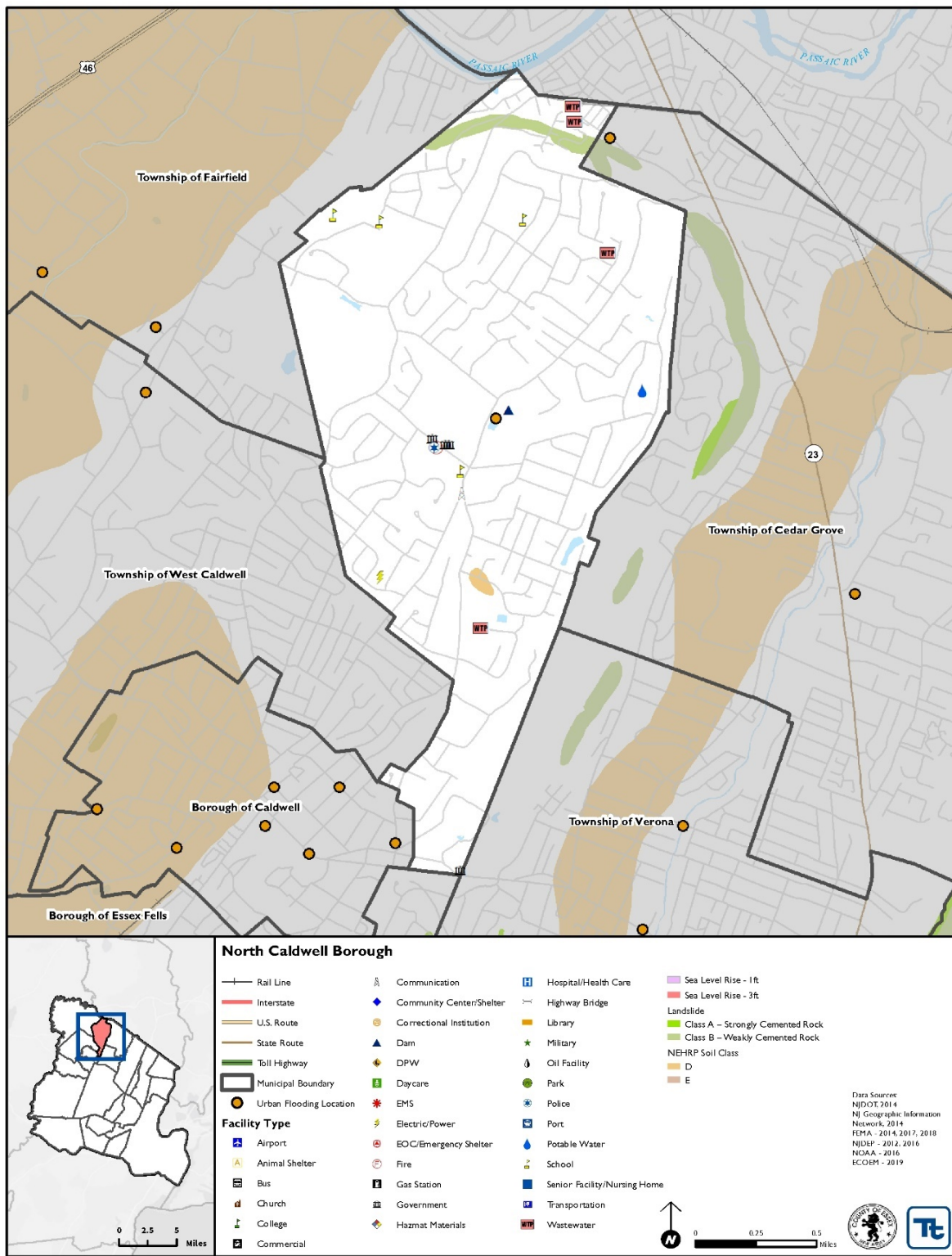




Figure 9.16-2. Borough of North Caldwell Hazard Area Extent and Location Map 2





Action Worksheet			
Project Name:	Mitigate the Green Brook Erosion		
Project Number:	2020-North Caldwell-001		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood		
Description of the Problem:	There has been significant streambed and streambank erosion occurring along Green Brook in North Caldwell which has impacts on the County's road and utility infrastructure. The affected road leads to the West Essex Regional Middle School and High School and could affect traffic to the schools.		
Action or Project Intended for Implementation			
Description of the Solution:	The Borough will work to meet with Fairfield, Essex County and the Green Brook Country Club (and any other stakeholders as identified) to develop a reasonable solution and cost sharing agreement for the streambed and bank stabilization of the Green Brook. The most feasible project will be used for grant applications to agencies such as FEMA and NJOEM.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	TBD by selected solution	Estimated Benefits (losses avoided):	Erosion mitigated and roadway protected
Useful Life:	TBD by selected solution	Goals Met:	
Estimated Cost:	TBD by selected solution	Mitigation Action Type:	Natural Systems Protection
Plan for Implementation			
Prioritization:	High	Desired Timeframe for Implementation:	TBD by selected solution
Estimated Time Required for Project Implementation:	TBD by selected solution	Potential Funding Sources:	County, municipal budget, HMGP
Responsible Organization:	Essex County, North Caldwell Administration, Fairfield Administration and Green Brook Country Club	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	Erosion continues to worsen the condition leading to failure of the road, utilities or nearby structures
	Relocate roadway, utilities and all other impacted structures	\$5M+	Does not solve the erosion; acquisition of properties and realignment of roads can be lengthy and costly due to multijurisdictional complications
	Coordinate a group of stakeholders to spearhead and implement a streambed and streambank stabilization project	\$1M+	Stabilization of the streambed and stream banks will slow stream velocities and lessen future erosion; coordination of multiple parties will be time consuming; cooperative effort by all stakeholders allows the issue to be addressed on a large scale
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			



Update Evaluation of the Problem and/or Solution:	
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Action Worksheet		
Project Name:	Mitigate the Green Brook Erosion	
Project Number:	2020-North Caldwell-001	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Nearby schools; county road; critical infrastructure
Property Protection	1	Roads, utilities and structure adjacent to brook
Cost-Effectiveness	1	Cost effective project
Technical	1	Technically feasible project
Political	1	North Caldwell & Essex County are in support of each other
Legal	0	Will require multijurisdictional coordination & NJDEP approval
Fiscal	0	Project will require grant funding and cost sharing
Environmental	1	Long-term solution to erosion has benefit to environment
Social	1	
Administrative	1	
Multi-Hazard	1	Flood, Erosion
Timeline	1	Can be achieved in <5 years with stakeholder cooperation
Agency Champion	1	Essex County, North Caldwell, Fairfield & Green Brook CC
Other Community Objectives	0	
Total	11	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Harden Water Tower Infrastructure by Mitigating Power Loss and Communication Issues		
Project Number:	2020-North Caldwell-002		
Risk / Vulnerability			
Hazard(s) of Concern:	Utility Interruption		
Description of the Problem:	The Borough's water tank on Skyline Drive is in a remote location and lacks backup power in the event of utility interruption. Further, the site does not have adequate and reliable alarms for communication to the Borough in a timely manner in the event of a system failure. Additionally, the site also lacks adequate security fencing.		
Action or Project Intended for Implementation			
Description of the Solution:	North Caldwell will pursue additional funding for a diesel generator to power the water tank site (including public safety communications, pumps and water tank controls). The Borough will also pursue additional funding for upgrades to a SCADA alarm system for remote monitoring and control.		
Is this project related to a Critical Facility or Lifeline?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Level of Protection:	Protection from utility interruption	Estimated Benefits (losses avoided):	Water Tower protected from utility failure
Useful Life:	15 years	Goals Met:	
Estimated Cost:	\$50,000	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:	1 year	Potential Funding Sources:	HMGP, municipal budget
Responsible Organization:	Borough Administration, DPW and OEM	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
	Increased DPW inspections during inclement weather or problematic times	\$10,000/yr (overtime)	Does not solve the problem; removes employees from other critical tasks; power loss and utility interruption will still occur but can be met with shorter response time
	Generator, Fencing and SCADA Upgrades	\$350,000	Generator serves as immediate back-up during interrupted power; generator will require ongoing fueling & maintenance; SCADA system would allow remote viewing and control of system for real time management; fencing secures site from vandalism and manmade interruptions
Progress Report (for plan maintenance)			
Date of Status Report:			
Report of Progress:			



Update Evaluation of the Problem and/or Solution:	
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Action Worksheet		
Project Name:	Harden Water Tower Infrastructure by Mitigating Power Loss and Communication Issues	
Project Number:	2020-North Caldwell-002	
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Reliable water utility to Borough
Property Protection	1	Fencing secures site
Cost-Effectiveness	1	Cost effective project
Technical	1	Technically feasible project
Political	1	
Legal	1	Borough has legal authority
Fiscal	0	Project may require grant funding
Environmental	1	No environmental restrictions on project
Social	1	No social impact
Administrative	1	Administrator & Engineer
Multi-Hazard	1	Power Outage, Utility Interruption
Timeline	1	Can be achieved in <5 years
Agency Champion	1	Borough Administration & DPW
Other Community Objectives	0	
Total	12	
Priority (High/Med/Low)	High	



Action Worksheet			
Project Name:	Mitigate flood-prone properties, including RL/SRL properties		
Project Number:	2020-North Caldwell-003		
Risk / Vulnerability			
Hazard(s) of Concern:	Flood, Severe Storm		
Description of the Problem:	Frequent flooding events have resulted in damages near Amelia Street, Mountain Avenue and Robin Hill Road. This area is residential, and these properties have been repetitively flooded as documented by paid NFIP claims.		
Action or Project Intended for Implementation			
Description of the Solution:	Conduct outreach to 3 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 on Amelia Street, Mountain Avenue and Robin Hill Road that experience frequent flooding (high risk areas).		
Is this project related to a Critical Facility or Lifeline?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
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:	
Estimated Cost:	\$3Million	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:	Mitigate flood-prone properties, including RL/SRL properties	
Project Number:	2020-North Caldwell-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 3 homes in Borough.
Administrative	0	
Multi-Hazard	1	Flood, Severe Storm
Timeline	0	
Agency Champion	1	NFIP Floodplain Administrator, supported by homeowners
Other Community Objectives	1	
Total	10	
Priority (High/Med/Low)	High	