12 Ellington

Community Overview

Ellington is a growing community that covers 34 square miles with a population of approximately 16,195 (2017, CT Department of Public Health). Ellington lies between 100 and 800 feet above sea level and is part of three watersheds, the Scantic to the west, the Hockanum in the middle, and the Willimantic to the east. Principal watercourses that run through Ellington include Broad, Charters, Creamery, Kimball's, Marsh, Martins and Muddy Brooks. With over 5,500 acres under cultivation, Ellington remains one of the largest agricultural production towns in Connecticut. Major thoroughfares in Ellington include north-south state route 83 and east-west state route 140. The eastern highlands ridgeline runs through the central part of town. This area contains extensive areas of upland forest including more than 1,200 acres of the Shenipsit State Forest.

New development since adoption of the 2014-2019 Capitol Region Natural Hazards Mitigation Plan Update ("2014 HMP") has been minimal, and has not occurred in floodplains or other notable hazard areas; hazard exposure has not increased due to development.

Critical Facilities

Critical facilities throughout the Capitol Region are listed in Appendix B. In Ellington these include the High School, Middle School, Windermere School, Crystal Lake Elementary School, Center School, Town Hall, Public Works Department (DPW), Fire Station 43, Resident State Trooper Office, Library, and a sewer pump station.

Most critical municipal facilities are located within a two-mile radius in the Town's center. Critical facilities are summarized in the Table below.

Table 12-1: Critical Facilities, Ellington

Facility	Shelter	Generator
Town Hall		X
Public Works Department		X
Board of Education Facilities		X
Fire Station 43		X
Resident State Trooper Office		X
High School	X	X
Middle School	Backup	X
Windermere School		X
Crystal Lake Elementary School	X	X
Hall Memorial Library		X
Sewer Pumping Station		X

Capabilities

Hazard mitigation is incorporated, to some degree, into Ellington's Plan of Conservation and Development (POCD). POCD actions specifically address natural hazards.
No new construction or demolition has occurred since 2008 in floodplains or other vulnerable areas. No changes have been made to zoning, floodplain or inland wetlands regulations since 2008 which would increase or decrease Ellington's vulnerability to natural hazards.

DPW staff are staged at the Crystal Lake Fire Department prior to forecast storm events to assist with response and recovery when that area becomes isolated from the rest of Town. Mutual aid agreements are in place with Vernon and Tolland to assist in that area.

A small portion of Ellington is served by public water, and a dry-hydrant program ensures firefighting water is available for other areas of Town. The Town Fire Marshal works with the CT Water Company to have hydrants installed when new water lines are added.

Tree maintenance is primarily addressed by the local utility company Eversource. The Town budgets $25,000 annually for tree-removal, on a case-by-case basis, on Town-owned property only. Costs are often shared with Eversource on "pop-up" tree removals.

New Capabilities

The Route 74 Bridge over the Hockanum River has undergone major improvements since adoption of the 2014 HMP. The bridge was built in 1983. A small culvert was being replaced at the time of development of the current Hazard Mitigation Plan.

A map modernization effort by FEMA is currently underway for Tolland County, but its full extent, and how much of Ellington it will cover, is unknown.

The Town is currently working to implement Low-Impact-Development regulations as part of its efforts to meet new MS4 requirements. A contractor has been hired to do this work.

Challenges

Challenges Overview

For Ellington, the natural hazards that have the greatest impact on the community are winter storms and hurricanes/tropical storms. A major challenge is maintaining public/emergency access from town center out toward the Crystal Lake community. Access is essential via State Routes 140 and 30. If Route 140 becomes blocked it becomes very difficult for emergency responders to get to Crystal Lake.

During times of lengthy town-wide power outages access to fuel could be limited by lack of generator power at fuel distribution facilities in and around town. The most recent major disasters reported by Ellington Town staff were Hurricanes Irene and Sandy, the 2013 Blizzard, and the 2015 Blizzard. Town staff report that there have been no known significant flooding issues since 2014.

Hazard Losses

The economic losses faced by Ellington from natural hazards can be estimated by reviewing historic, and modeling future, loss figures. Loss estimates are summarized below.

Historic FEMA Payments

FEMA reimburses communities for hazard losses through programs including Public Assistance (PA) and the National Flood Insurance Program (NFIP). Combining PA and private flood insurance payments can give an estimate for total losses to a community.

The NFIP has paid four property damage claims in Ellington totaling $8,954 to-date; none have been Repetitive Loss (RL) Property claims.

Total PA reimbursements to the community were as follows:

- Flood Events: $37,271 ($1,962 annually)
- Hurricane Events: $70,462 ($3,709 annually)
- Winter Storm Events: $1,275,223 ($67,117 annually)

These are summarized in the tables below.

Table 12-2: Flood Event PA Reimbursements, Ellington

Incident	Oct 2005
Declaration	12/16/2005
Disaster No.	1619
Entity	**FEMA PA Reimbursement**
State	$2,269
Municipal	$35,003
Nonprofit	$0
Total	**$37,271**
Annualized	**$1,962**

Table 12-3: Hurricane Wind Event PA Reimbursements, Ellington

Incident	Aug - Sep 2011 (T.S. Irene)	Oct - Nov 2012 (Storm Sandy)
Declaration	9/2/2011	10/30/2012
Disaster #	4023	4087
Entity	**FEMA PA Reimbursement**	**FEMA PA Reimbursement**
State	$1,004	$4,695
Municipal	$44,076	$20,687
Nonprofit	$0	$0
Total	**$45,081**	**$25,381**
Annualized	**$2,373**	**$1,336**

Table 12-4: Winter Storm PA Reimbursements, Ellington

Incident	Mar 2003	Dec 2003	Jan 2005	Feb 2006	Jan 2011	Oct 2011	Feb 2013	Jan 2015
Declaration	3/11/03	1/15/04	2/17/05	5/2/06	3/3/11	11/17/11	3/21/13	4/8/15
Disaster #	3176	3192	3200	3266	1958	4046	4106	4213
Entity	FEMA PA Reimbursement							
State	$15,841	$16,386	$23,419	$21,319	$26,672	$4,085	$22,214	$42,988
Municipal	$31,849	$40,143	$48,860	$43,627	$77,626	$633,363	$123,182	$88,471
Nonprofit	$0	$0	$0	$0	$0	$15,178	$0	$0
Total	**$47,690**	**$56,529**	**$72,279**	**$64,946**	**$104,297**	**$652,626**	**$145,396**	**$131,458**
Annualized	**$2,510**	**$2,975**	**$3,804**	**$3,418**	**$5,489**	**$34,349**	**$7,652**	**$6,919**

National Centers for Environmental Information Losses

The National Centers for Environmental Information (NCEI) severe storm database was reviewed to identify events that had impacted Ellington. The table below summarizes events in that database that were specifically noted as having impacted Ellington since 2012.

Table 12-5: NCEI Database Losses since 2012, Ellington

Date	Event	Property Damage
6/22/2012	Thunderstorm Wind	$10,000
8/10/2012	Thunderstorm Wind	$3,000
8/4/2013	Thunderstorm Wind	*$2,500
7/27/2014	Hail	$5,000
9/2/2014	Thunderstorm Wind	$5,000
7/22/2016	Thunderstorm Wind	$50,000
Total		**$75,500**

* Damages from storm divided between multiple communities

NCEI losses under other event categories (such as drought, high wind, flooding, and winter storms) were not specifically noted as impacting Ellington, though they did impact Tolland County and nearby towns. NCEI losses are reported in Section II of this Plan.

HAZUS-MH Losses

CRCOG used FEMA's Hazus-MH model to analyze the risks that the Town of Ellington might face from flooding, hurricanes, and earthquakes. The model estimates economic losses to the town due to damage to buildings and building contents, as well as other economic disruptions. Both residential and commercial structures are addressed. Losses from different hazards are summarized below. Where available, estimates from the previous and current versions of the HMP are provided side-by-side; differences between the two may have been caused by a combination of the following:

- Changes in methodology: such as hazard zone mapping
- Changes in data: such as population and property values
- Changes in the model: this HMP utilized Hazus-MH version 4.0 rather than 2.1
- Other factors: inherent in a complex software like Hazus-MH

More details are available in the Multi-Jurisdictional HMP. Ultimately, changes in the loss estimates reflect the reality that small differences in hazard event features can have a significant impact on losses incurred.

Table 12-6: Estimated Damages to Ellington from a 1% Annual-Chance Flood

Loss Type	2014 Results	2018 Results
Households Displaced	132	210
People Needing Shelter	130	306
Buildings at Least Moderately Damaged	0	0
Economic Losses		
Residential Building & Content Losses	$1,620,000	$5,900,814
Other Building & Content Losses	$9,460,000	$8,246,928
Total Building & Content Loss	**$11,080,000**	**$14,147,742**
Total Business Interruption Losses	**$40,000**	**$470,916**
TOTAL	**$11,120,000**	**$14,618,658**

Table 12-7: Estimated Damages to Ellington from a 1% Annual-Chance Hurricane

Loss Type	2014 Results (1938 event)	2018 Results (1% track)
Buildings at Least Moderately Damaged	699	1
Buildings Completely Damaged	54	0
Total Debris Generated (tons)	57,551	9198
Truckloads (at 25 tons/truck) of building debris	314	368
Economic Losses		
Residential Building & Content Losses	$63,640,000	$7,967,558
Other Building & Content Losses	$14,245,000	$367,180
Total Building & Content Loss	**$87,370,000**	**$8,334,738**
Total Business Interruption Losses	**$9,485,000**	**$544,541**
TOTAL LOSSES	**$96,855,000**	**$8,879,279**

Losses were calculated from a modeled probabilistic earthquake (1% annual-chance of occurrence), as well as for four specific scenarios with epicenters around Connecticut.

Table 12-8: Estimated Damages to Ellington from a Probabilistic Earthquake

Loss Type	2018 Results
Wage Loss	$1,126
Rent Loss	$1,368
Relocation Loss	$2,285
Income Loss	$915
Inventory Loss	$191
Total Business Disruption	**$5,884**
Structural Loss	$4,973
Non-Structural Loss	$17,116
Total Building Loss	**$22,089**
Total Content Loss	**$6,252**
TOTAL LOSSES	**$34,226**

Table 12-9: Estimated Damages to Ellington from Modeled Earthquake Scenarios

Epicenter Location	Magnitude	Estimated Total Losses
East Haddam	6.4	$123,500.26
Haddam	5.7	$24,132.54
Portland	5.7	$44,612.11
Stamford	5.7	$3,086.37

Average Annualized Losses

Average Annualized Loss (AAL) figures are useful tools for comparison of the risks faced from different hazards with different likelihoods of occurring in a given time period. AAL estimates were prepared for Ellington based on the methodologies discussed in Section II of the Multi-Jurisdictional HMP. Dam failure, drought, tornado, and wildfire losses were sourced from the 2014 Connecticut Natural Hazard Mitigation Plan Update, with dam failure data supplemented by the National Performance of Dams Program and the Connecticut Department of Energy & Environmental Protection. Earthquake and hurricane losses were calculated in HAZUS-MH. Losses for flooding came from NFIP claims, for winter storms from Public Assistance Reimbursements, and for thunderstorms from the NCEI database. These are presented in the table below in dollars per year. Note that Hurricanes and Tropical Storms represent the largest share of total annualized losses.

Table 12-10: Average Annualized Losses, Ellington

Dam Failure	Drought	Earthquakes	Flooding	Hurricanes and Tropical Storms	Severe Winter Storms	Thunderstorms	Tornadoes	Wildfires	Total
$959	$0	$34,226	$2,197	$1,057,291	$67,117	$5,679	$4,534	$4,469	$1,176,473

Losses Summary

A review of the above loss estimates demonstrates that the Town of Ellington has experienced significant expenses as a result of natural hazards, and is at risk for additional losses if some of the less-frequent events were to occur. These actual and potential losses justify hazard mitigation actions to reduce losses in the future.

Mitigation Strategies and Actions

Noted Hazard Mitigation Needs

During the course of this Plan development, multiple hazard mitigation needs of Ellington were noted, including:

- Address isolation of Crystal Lake community
- Increase the number of dry-hydrants in Town

Status of Previous Mitigation Strategies and Actions

The Town of Ellington reviewed the mitigation actions proposed in the 2014 HMP and determined the status of each. That information is included in the table below.

Table 12-11: Status of Previous Mitigation Strategies and Actions, Ellington

Action #	Action	Notes	Status
GOAL: REDUCE ECONOMIC AND SOCIAL IMPACT CAUSED BY LOSS OF POWER.			
Objective 1: Provide auxiliary power to critical facilities.			
1.1	Work with the Capitol Region Emergency Planning Commission to obtain generators for all five schools and town hall complex.	Done. Windermere School and the library now have generators.	Complete
1.2	Complete strategic plan for evacuating and sheltering special needs populations with emphasis on sheltering in place for those not able to get to designated shelters (i.e. Snipsic Village Community Building)	Action complete.	Complete
1.3	Encourage private fuel dispensaries to install back-up generator power to ensure continued access to fuel for residential and business transportation, heating/cooling and power needs.	No direct outreach, though a few did add generators when renovated.	Carry Forward
GOAL: MINIMIZE DAMAGE RESULTING FROM FLOODING.			
Objective 1: Ensure infrastructure is constructed to FEMA standards			
1.1	Continue to work with CRCOG to advance Windermere Bridge renovation project on DOT list.	This is a State project; the Town does not need to be involved.	Drop
1.2	Work with State DOT to ensure safe/emergency vehicular passage to the Crystal Lake community prior to, during and after storms (Routes 140 and 30).	No action to date but should be kept and revisited.	Carry Forward
1.3	Continue to work with CRCOG to advance Route 74 bridge renovation project on DOT list in Vernon.	Project has been completed.	Complete
Objective 2: Ensure buildings are constructed to FEMA standards.			
2.1	Continue to implement & enforce local building & zoning regulations to prevent development in risk-prone areas.	Existing capability / ongoing activity.	Capability
Objective 3: Protect the integrity of "Great Swamp" and other wetlands from development pressure.			
3.1	Educate public on property owners' responsibility to maintain drainage systems.	Existing capability / ongoing activity.	Capability

Active Mitigation Strategies and Actions

The Town proposed to initiate several new mitigation actions for the upcoming five years. Additionally, a number of actions from the previous planning period are being carried forward or replaced with revised actions. These are listed below.

Each of the following actions has been prioritized based on FEMA guidelines, listed from highest to lowest priority, and numbered.

Action #1	
Assess possible alternate routes to Crystal Lake, or other solutions to the risk of isolation in that area (such as stationing personnel there) to determine the cost-effectiveness of different options.	
Goal	7. Improve the emergency response capabilities of the region and its communities
Category	Preparedness & Emergency Response
Lead	Planning
Cost	$0 - $10,000
Funding	Town Operating Budget
Timeframe	07/2019 - 06/2020
Priority	High

Action #2	
Work with State DOT to advance road improvement and maintenance projects to ensure access to and egress from the Crystal Lake community remains open during and after storms (Routes 140 and 30).	
Goal	7. Improve the emergency response capabilities of the region and its communities
Category	Structural Projects
Lead	Public Works
Cost	$0 - $10,000
Funding	Town Operating Budget / Grants
Timeframe	07/2019 - 06/2020
Priority	High

Action #3	
Conduct outreach to local small businesses with the aim of preventing the accidental release and pollution from chemicals stored and used at their facilities during or following natural hazard events.	
Goal	6. Improve public outreach, education, and warning systems
Category	Education & Awareness
Lead	Planning, in coordination with DEEP
Cost	$0 - $10,000
Funding	Materials & Resources Provided by CT DEEP
Timeframe	01/2019 - 12/2019
Priority	Medium

Action #4	
Coordinate with NEMO and CRCOG to share resources and gain technical support for hazard mitigation actions involving stormwater management and public outreach, which have parallel benefits related to MS4 stormwater permit compliance.	
Goal	1. Minimize the impact of natural hazards on physical buildings and infrastructure
Category	Prevention
Lead	Public Works
Cost	$0 - $10,000
Funding	Town Operating Budget
Timeframe	01/2020 - 12/2020
Priority	Medium

Action #5	
Participate in EMI courses or the seminars and annual conference held by the Connecticut Association of Flood Managers.	
Goal	3. Improve institutional awareness and understanding of natural hazard impacts and mitigation within municipal governments and other decision-making bodies
Category	Education & Awareness
Lead	Planning
Cost	$0 - $10,000
Funding	Town Operating Budget
Timeframe	07/2019 - 06/2024
Priority	Medium

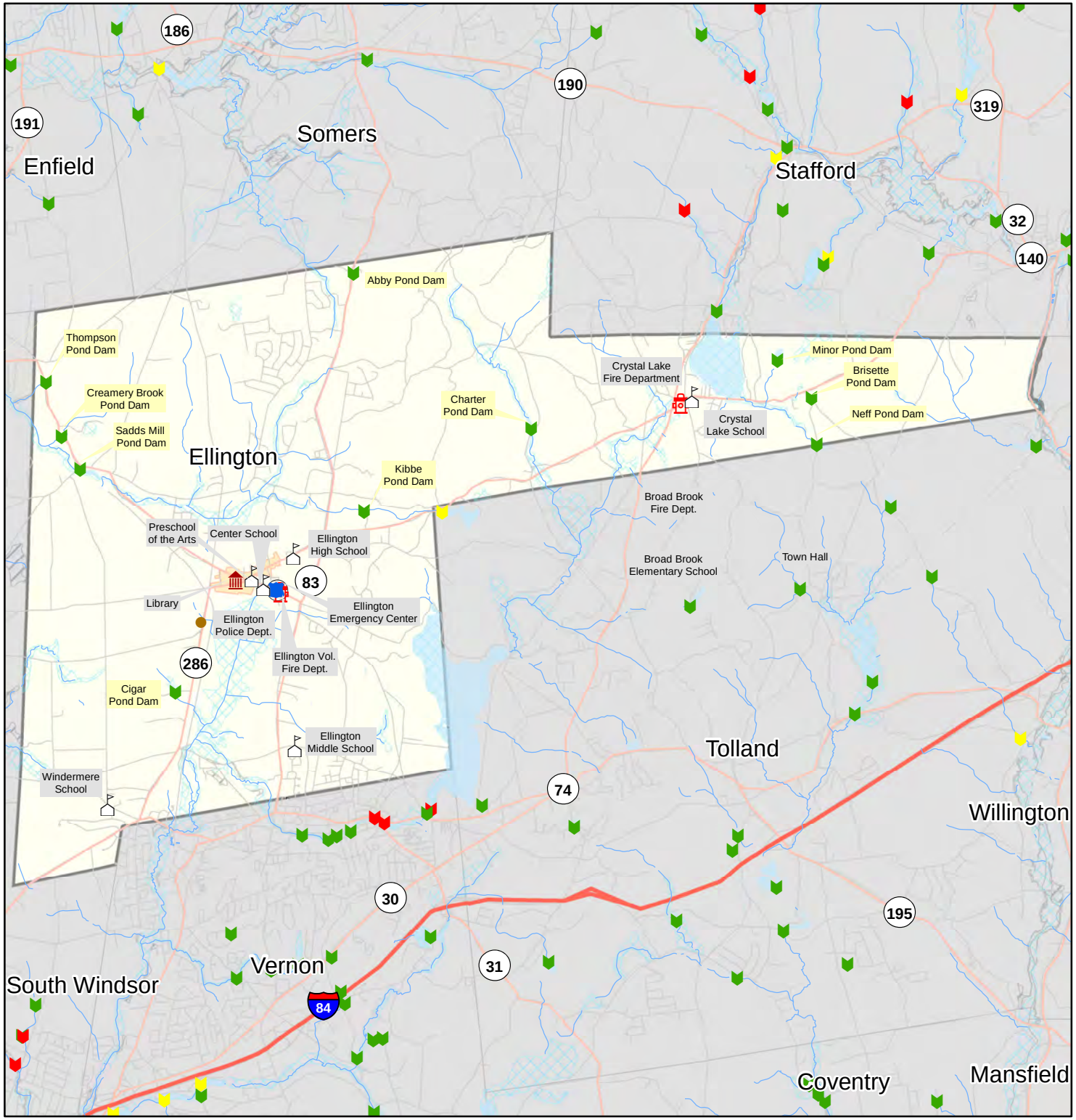
Action #6	
Perform an outreach effort to private fuel dispensaries encouraging them to install back-up generator power to ensure continued access to fuel for residential and business transportation, heating/cooling, and power needs.	
Goal	5. Improve the resilience of local and regional utilities and infrastructure using strategies including adaptation, hardening, and creating redundancies.
Category	Preparedness & Emergency Response
Lead	Emergency Management
Cost	$10,000 - $25,000
Funding	Town Operating Budget
Timeframe	07/2020 - 06/2022
Priority	Medium

Action #7	
Explore feasibility and cost/benefit balance of developing a microgrid for the Town Hall / Board of Education / Center School complex and/or the Resident-State-Trooper / Recreation Department / Fire Station 43 / Public Works complex.	
Goal	5. Improve the resilience of local and regional utilities and infrastructure using strategies including adaptation, hardening, and creating redundancies.
Category	Prevention
Lead	Public Works
Cost	$10,000 - $25,000
Funding	Town Operating Budget / Grants / CT DEEP
Timeframe	01/2020 - 12/2022
Priority	Medium

Action #8	
Seek Certification within the Sustainable CT program and make progress with the hazard mitigation goals associated with SustainableCT certified actions.	
Goal	4. Increase the use of natural, “green,” or “soft” hazard mitigation measures, such as open space preservation and green infrastructure.
Category	Natural Resources Protection
Lead	Planning
Cost	$0 - $10,000
Funding	Town Operating Budget
Timeframe	07/2021 - 06/2022
Priority	Low

Action #9	
Coordinate with CT SHPO to conduct historic resource surveys, focusing on areas within natural hazard risk zones (such as flood or wildfire hazard zones and areas near steep slopes), to support identification of vulnerable historic properties and preparation of resiliency plans across the state. This action leverages existing resources and best practices for protection of historic and cultural resources through an ongoing statewide initiative by CT SHPO.	
Goal	8. Ensure community character and social equity are addressed in mitigation activities
Category	Property Protection
Lead	Planning, in coordination with SHPO
Cost	$10,000 - $25,000
Funding	SHPO
Timeframe	07/2021 - 06/2023
Priority	Low

Action #10	
Conduct a wildfire vulnerability and needs assessment to guide construction of additional dry hydrants and/or cisterns and fire roads through forested areas.	
Goal	3. Improve institutional awareness and understanding of natural hazard impacts and mitigation within municipal governments and other decision-making bodies
Category	Prevention
Lead	Fire Department
Cost	$25,000 - $50,000
Funding	Town Operating Budget / Grants / CT DEEP
Timeframe	07/2023 - 06/2024
Priority	Low



Capitol Region Natural Hazards Mitigation Plan Update

Ellington, Connecticut

Flood Plains, Dams & Critical Facilities

Dam Hazard Class

- BB, A, AA OR Unclassified
- Class B - Significant Hazard
- Class C - High Hazard

Critical Facilities

- Fire Station
- Police Station
- School
- Healthcare Facility
- State Facility
- Town Facility
- Waste Water Facility
- Emergency Center
- NRHP Buildings/Sites
- NRHP Districts/Areas

FEMA Flood Hazard Area

- 100 Year Flood Zone
- 500 Year Flood Zone

Data Sources: FEMA, National Register of Historic Places, CT DEEP, CRCOG, ESRI

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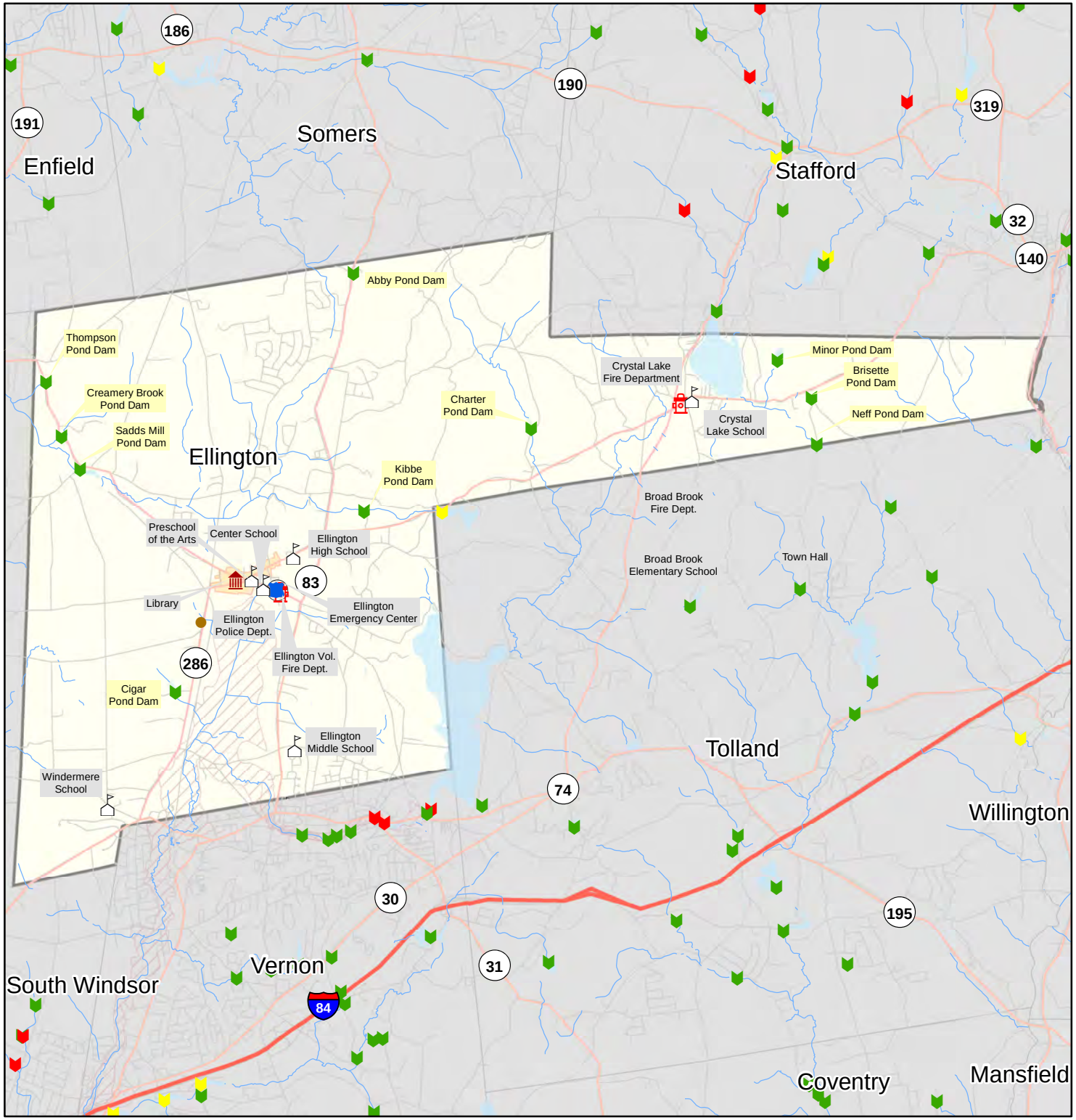

Capitol Region Natural Hazards Mitigation Plan Update

Ellington, Connecticut

Dam Breach Inundation Area
& Critical Facilities

Dam Hazard Class

- BB, A, AA OR Unclassified
- Class B - Significant Hazard
- Class C - High Hazard

Critical Facilities

- Fire Station
- Police Station
- School
- Healthcare Facility
- State Facility
- Town Facility
- Waste Water Facility
- Emergency Center
- NRHP Buildings/Sites
- NRHP Districts/Areas
- Dam Breach Inundation Areas

Data Sources: FEMA, National Register of Historic Places, CT DEEP, CRCOG, ESRI

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