Draft Town of Arlington Hazard Mitigation Plan

Arlington, Vermont

April 8, 2019

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I. Introduction

A. Purpose

Hazard mitigation actions are intended to reduce potential losses from natural hazards such as flooding, landslides, wildland fire, and similar events. Hazard mitigation plans identify, assess and prioritize those hazards and present actions that a community can undertake to reduce risks and damage from those natural hazards (Federal Emergency Management Agency 2013a).

This plan identifies, describes and prioritizes potential natural hazards that could affect the Town of Arlington in Bennington County, Vermont and provides specific measures to reduce or avoid those effects. The Federal Emergency Management Agency (FEMA), within the U.S. Department of Homeland Security and the Vermont Department of Emergency Management both advocate the implementation of hazard mitigation measures to save lives and property and reduce the financial and human costs of disasters.

The format of this plan is as follows. Section II provides a profile of the town, including a discussion of the environmental setting, demographics and settlement patterns. Section III describes the planning process along with lists of members of the planning team and dates of meetings and public and agency review. Section IV analyzes the following hazards:

- Flooding and Fluvial Erosion
- Winter Storms
- High Wind Events
- Hail
- Temperature Extremes
- Drought
- Wildfire
- Earthquake
- Landslides and Rock Falls
- Invasive Species
- Hazardous Materials Spill
- Infectious Disease Outbreak

Section V assesses vulnerability, and Section VI discusses mitigation goals and actions, including current programs and town capabilities. Section VII describes how the plan will be maintained and updated.

B. Mitigation Goals

The Town identified the following mitigation goals:

1. Reduce injury and loss of life resulting from natural disasters.
2. Reduce damage to public infrastructure, minimize disruption to the road network and maintain both normal and emergency access.
3. Establish and manage a program to proactively implement mitigation projects for roads, bridges, culverts, water supply systems and other municipal facilities to ensure that community infrastructure is not significantly damaged by natural hazard events.
4. Design and implement mitigation measures so as to minimize impacts to rivers, water bodies and other natural features, historic structures, and neighborhood character.
5. Increase the economic resiliency of Arlington by reducing the economic impacts incurred by municipal, residential, agricultural and commercial establishments due to disasters.
6. Incorporate hazard mitigation planning into other community planning projects, such as Town Plan, Capital Improvement Plan, and Town Local Emergency Management Plan
7. Ensure that members of the general public continue to be engaged in the hazard mitigation planning process.

II. Town Profile

A. Regional Context

The Town of Arlington is located in west-central Bennington County in southwest Vermont. Arlington is approximately 42.3 square miles in area and bordered on the north by the Town of Sandgate, on the east by Sunderland, on the south by Shaftsbury and on the west by the towns of Salem, Jackson, and White Creek in New York (Map 1). Major routes through the town are Vermont Routes 7A and 313. US 7 is to the east and goes through Sunderland, but there is an exit for Arlington. A railroad from New York though North Bennington, passes through Arlington on the way to Rutland (Town of Arlington 2015).

B. Demography and Land Use

The 2010 Arlington population is 2,317 representing a decline of 3.3% from 2000. Total households were 999, a decrease from 2000 of ten households. By comparison, the population growth from 2000 to 2010 in Bennington County was 0.35% and 2.8% in the State of Vermont (Bennington County Regional Commission 2015). As of 2010, there were 1,243 housing units,

of which 761 were owner occupied, 238 were rental units and 204 were seasonal. There were a small number of units that were vacant or for sale (Town of Arlington 2015).

The main settled areas are within the Batten Kill valley which also includes the transportation corridor for Routes 7A and 313. To the west and north is Red Mountain and to the south and east is Grass Mountain and Spruce Peak. Both of these areas are primarily forested. There are some agricultural lands along the Batten Kill (Maps 1 and 2).

C. Economic and Cultural Resources

Arlington has a fairly diverse economy for a small rural community with major manufacturing employers such as Mack Molding and Quadra-Tek, as well as many smaller commercial establishments. Most of those employed in Arlington work in social services, health care, education, retail and lodging and entertainment. The Town's natural resource base provides some employment opportunities in forestry, recreation, and agriculture (Town of Arlington 2015).

Map 3 shows the land use designations from the 2015 Arlington Town. Most commercial and industrial uses area located in the areas designated for commercial uses, which are located within the valley areas of the town. Two areas, Arlington and East Arlington, have been designated by the Vermont Agency of Commerce and Community Development as village centers and represent the two core commercial centers in the Town of Arlington. Arlington includes several stores including Paulin's, Stewarts, Miles Hardware, the post office, the Town Hall and several inns and restaurants. East Arlington also has a post office, the Arlington Fire Department, and some existing and other vacant stores. Up until the 1990's, East Arlington was a vibrant and diverse commercial center, but is now has several vacant storefronts. While the reasons for this decline are not clear, space for adequate on-site septic systems limits development opportunities here. Both are within walking distance of numerous residences as well as Arlington Memorial High School and Middle School, Fisher Elementary and the Martha Canfield Library. The Town of Arlington has areas designated in the National Register of Historic Places. These both represent clusters of important historic buildings (Map 3). In addition, the West Arlington Covered Bridge is on the National Register and is within an area designated as a state historic district (Map 3).

D. Critical Facilities

Table 1 lists and describes critical facilities including town facilities, utility substations, schools, and sites with hazardous substances. These are labeled and shown on Map 4. The transportation system also represents a set of critical facilities. Arlington contains 48.757 miles of travelled highways consisting of 4.583 miles of Class 1 roads, 7.910 miles of Class 2 roads, 26.72 miles of Class 3 roads, for a total of 34.680 miles of roads maintained by the town, and 2.71 miles of Class 4 roads. There are also 14.047 miles of state highway (VT-7A, VT-313) (Vermont Agency of Transportation, 2017). Public and private water systems are discussed under IV. F. Drought.

Table 1. Arlington critical facilities (see Map 4). Source: Local Emergency Operations Plan for the Town of Arlington; Arlington Select Board		
Label	Name	Description
1	Arlington Town Hall 3828 VT Route 7A	Town Hall/Secondary Emergency Operations Center
2	East Arlington Fire House 184 Old Mill Rd.	Fire Department/Shelter/Primary Emergency Operations Center
3	Arlington Memorial Middle School and High School 529 East Arlington Rd.	School/Shelter
4	Fisher Elementary 504 East Arlington Rd.	School/Shelter
5	West Arlington Fire Station	Fire Department
6	Arlington Rescue Squad	Rescue Squad
7	Town Highway Garage	Highway Garage
8	Arlington Wastewater Plant	Wastewater System
9	Arlington Water Supply	Water Supply

Table 2 lists vulnerable populations listed in the Arlington LEOP. These are shown on Map 5.

Table 2. Arlington vulnerable populations (see Map 5). Source: Local Emergency Operations Plan for the Town of Arlington		
Label	High Risk Population Type (school, daycare, nursing home, medical equipment-dependent resident, handicapped resident)	High Risk Population Description
1	Arlington High School 529 East Arlington Rd	Enrollment: 220
2	Fisher Elementary School 504 East Arlington Rd Fisher Elementary Pre-K & After School Program	Enrollment: 220
3	Happy Days Play School 426 East Arlington Rd	Enrollment: 74
4	Zelinsky Mary 514 Red Mountain Road	
5	Mack Molding manufacturing plant 83 East Arlington Rd.	Employees: 103 all shifts
6	Mack Molding manufacturing plant 608 Warm Brook Rd.	Employees: 383 all shifts
7	H B H Prestain manufacturing plant Hale Rd. / 1225 East Arlington Rd.	Employees:30

Table 2. Arlington vulnerable populations (see Map 5). Source: Local Emergency Operations Plan for the Town of Arlington		
Label	High Risk Population Type (school, daycare, nursing home, medical equipment-dependent resident, handicapped resident)	High Risk Population Description
8	H B H Prestain manufacturing plant 29 Short Street	Employees: 6
9	Camping on the Battenkill Vermont Route 7A	105 campsites
10	Howell's Campground No Name Road	20 campsites
11	Shires Housing 3662 VT Route 7A	45 residents with some seniors
12	Shires Housing 409 VT Route 313 West	
13	Shires Housing 431 Battenkill Lane	
14	Shires Housing 30 Battenkill Lane	
15	Mears Mobile Home Park Route 7A Park Lane	Mobile home park

III. Planning Process

A. Planning Team

The Bennington County Regional Commission began discussions with the Town on developing a hazard mitigation plan in 2016, and the Arlington Select Board decided to initiate planning that year. This is a significant update to the Town of Arlington Hazard Mitigation Plan adopted in 2012. The hazard mitigation planning team consisted of members the Arlington Select Board listed in Table 3 below

Table 3. Planning committee members	
Name	Affiliation
Keith Squires	Arlington Select Board Chair
Cynthia Browning	Arlington Select Board
Daniel Harvey	Arlington Select Board
Reginald Jennings	Arlington Select Board (till 2019)
Tim Williams	Arlington Select Board
Mat Bykowski	Arlington Select Board

In addition, individual meetings were held with Jamie Paustian, Arlington Fire Chief and Gary Weller, Arlington Road Foreman.

B. Public Involvement

Arlington started the planning process in the summer of 2016 and held several meetings of the planning committee. These meetings were warned according to the Vermont Open Meetings Law, and dates are listed in Table 4.

Table 4. Dates of planning meetings and public and agency review

Meeting	Date (s)
Select Board initiates planning process	June 27, 2016
Planning committee organizational meeting	July 16, 2018
Planning committee meeting	July 30, 2018
Planning committee meeting	August 13, 2018
Planning committee meeting	August 27, 2018
Planning committee meeting	September 10, 2018
Planning committee meeting	September 24, 2018
Planning committee meeting	October 8, 2018
Planning committee meeting	October 22, 2018
Planning committee meeting	November 5, 2018
Planning committee meeting	December 17, 2018
Public Meeting in the Arlington Town Hall	January 7, 2019
Public Meeting in the Arlington Town Hall	April 8, 2019
Select Board meeting and vote to send to FEMA	April 8, 2019
Select Board adoption of FEMA approved pending adoption version	

The plan was posted on the town website and on the website of the Bennington County Regional Commission. The plan was also sent to:

The Town of Manchester Town Manager
The Town of Sunderland Select Board Chair and Town Clerk
The Town of Sandgate Select Board Chair and Town Clerk
The Town of Shaftsbury Select Board Chair and Town Clerk
The Town of Glastenbury Supervisor
The Town of Jackson, New York
The Town of Salem, New York
The Town of White Creek, New York
The Chair of LEPC 7
The Director of the Bennington County Conservation District
The Director of the Bennington County Regional Commission

All were asked to share the plan with appropriate town staff and officials. Comments were requested by email, phone or letter and were to be sent to either Keith Squires, the Town of Arlington Select Board Chair or to Michael Batcher at the Bennington County Regional Commission. Comments received are summarized in Appendix I.

C. Hazard Assessment

The following sections provide a detailed assessment of each of the hazards based identified by the planning team based on data from the following sources listed in Section VIII References:

a. Local knowledge
b. The National Climate Data Center (NCDC) storm events database (most recent data from their FTP site)
c. FEMA lists and descriptions of past disaster declarations
d. The Vermont Department of Forests, Parks and Recreation data on wildfires
e. HAZUS runs on potential earthquake damage
f. Cooperative weather observer data and station normal where available
g. Palmer Hydrologic Drought Index calculated from 1985 to 2017 from the National Oceanographic and Atmospheric Administration (NOAA)
h. Hazardous materials spills from the Vermont Agency of Natural Resources (VT ANR)
i. Infectious disease outbreaks listed from the Vermont Department of Health
j. Observations of invasive species compared to the state and federal lists of noxious species
k. The Vermont Hazard Mitigation Plan (2018)
l. New England Weather, New England Climate (Zielinski and Keim 2003), Vermont Weather Book (Ludlum 1996)
m. FEMA 2015 Flood Insurance Study, Bennington County, Vermont and Incorporated areas, Federal Emergency Management Agency Study Number 5003CV000A
n. Fuel types and potential for wildfire from LANDFIRE (http://www.landfire.gov/) and from the Vermont Department of Parks, Forests and Recreation
o. Earthquake data from the Northeast Earthquake Maps and Catalog (http://www.bc.edu/research/westonobservatory/northeast/eqcatalogs.html)
p. Vermont Agency of Natural Resources and Vermont Agency of Agriculture, Food and Markets on invasive species and surveys completed within Arlington.
q. Identification of ranking of the potential for landslides by Josh Duncan (2015), a student at Green Mountain College using a modified protocol based on Clift and Springston (2012)
r. Hazardous materials spill from the VT ANR database
s. Infectious disease occurrences from the Vermont Department of Health

With respect to NCDC data, there have been numerous changes to that database in just the last few years. While NCDC data goes back to 1950, there was a dramatic change in 1996 in

the way data were collected. The number of events recorded in years prior to 1996 is far less than from 1996 onward. Therefore, for the best reliable data, we used only data from 1996 onwards. We have also looked at the other sources of historical weather data. The cooperative weather observers for Peru, Sunderland and Pownal in Vermont have the most consistent long-term data, though some data is available from the North Adams, MA observer. The only stream gauge is in Bennington near the New York border on the Walloomsac, which is in a different watershed than the Batten Kill, which encompasses Arlington. There are no weather stations that record or keep long term data records in Arlington except for the cooperative weather listed above observers who record daily observations, but not the specifics of storm events.

We have communicated with USGS which is working on models of areas impacted by different storm events using Lidar and stream gauge data, but they are not working in Vermont as yet as far as we know. We looked at the USGS high water marks for Irene (Medalie and Olson 2013), but they were located only along the Batten Kill in Arlington and portions of the Roaring Branch and Walloomsac in Bennington. These high-water marks appear to correspond to the outer boundaries of the base flood elevation shown in the final FEMA flood maps.

Finally, we reviewed several studies on potential impacts of climate change developed by the Intergovernmental Panel on Climate Change (Christensen et al 2013), the Vermont Agency of Natural Resources (Tetra Tech 2013), the University of Vermont (Galford et al. 2014), the Global Climate Change Research Program (Horton et al 2014), and the U.S. Forest Service (Rustad 2012). The relationship between climate change and the frequency and extent of natural hazards is a developing science, and we described, where appropriate, how climate change might affect hazards in the future.

IV. Hazard Assessment

A. Flooding and Fluvial Erosion

1. Description

a. Flooding

Flooding and associated fluvial erosion are the most frequent and damaging natural hazards in Vermont. The National Weather Service (2010) defines a flood as “any high flow, overflow, or inundations by water which causes or threatens damage.” A flash flood is …” a rapid and extreme flow of high water into a normally dry area, or a rapid water rise in a stream or creek above a predetermined flood level.” These are usually within six hours of some event, such as a thunderstorm, but may also occur during floods when rainfall intensity increases, thereby causing rapid rise in flow. The NWS uses the following impact categories:

- Minor Flooding - minimal or no property damage, but possibly some public threat.

- Moderate Flooding - some inundation of structures and roads near stream. Some evacuations of people and/or transfer of property to higher elevations.
- Major Flooding - extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.
- Record Flooding - flooding which equals or exceeds the highest stage or discharge observed at a given site during the period of record keeping.

Floods may reach these magnitude levels in one or more reaches, but not necessarily all. Runoff from snowmelt in the spring, summer thunderstorms, and tropical storms and hurricanes can all result in flooding in Arlington. Ice jam flooding can occur on Vermont rivers when substantial ice forms followed by several days of warmth, snowmelt and any rainfall leading to ice breakup. As the ice breaks up on the rivers, chunks of ice form jams which cause localized flooding on main stem and tributary rivers. Ice jams are most prevalent during the January thaw (late January) and in March and April as spring approaches.

Flash floods can occur after spring melt of mountain snow, following large storms such as Tropical Storm Irene, or after significant thunderstorms. Digital flood zone maps have been prepared and are currently under review. Map 5 shows the location of both flood hazard zones and river corridors (formerly fluvial erosion hazard zones).

Most development in Arlington is located in the valleys along the Batten Kill. Headwaters of these streams can be very flashy, and while some flood losses are the result of inundation, more often flood losses are caused by fluvial erosion. Fluvial erosion can range from gradual bank erosion to catastrophic changes in the location of the river channel (Vermont River Management Program 2010). There are no dams located in Arlington.

b. Fluvial Erosion

In Vermont, most rivers flow through relatively confined valleys, but still meander over time across the floodplain. River corridors provide an area within which a river can move across the landscape as it dissipates energy and transports and deposits sediments. Where rivers are constricted by bridges and other structures or rip rap, the water moves at higher velocity, resulting in downcutting and collapse of the banks. This may undermine structures within the corridor.

2. Previous Occurrences

Ludlum (1996) describes numerous storm events that have affected Vermont since settlement, but the local impacts of these are difficult to trace. The 1927 flood was the largest disaster in the history of the state. The state received over six inches of rain, with some areas receiving 8-9 inches. Following a rainy October, this storm occurred from November 2nd through the 4th causing extensive flooding. Two storms occurred in March of 1936. Heavy rains

and snowmelt caused significant flooding. Two years later, the 1938 hurricane caused both flooding and extensive wind damage.

Table 5. Total number of flood events by type and year for Bennington County.
Source: National Climate Data Center 2015

Year	Flash Flood	Flood	Total
1996	3	6	9
1997			
1998	1	3	4
1999	2		2
2000	4	1	5
2001			
2002	1		1
2003		2	2
2004	1	5	6
2005		5	5
2006			1
2007	1	1	2
2008			
2009	2		2
2010			
2011	3	3	6
2012			
2013	4		4
2014			
2015			
2016			
2017		1	1
Total	22	28	50

Table 5 shows a total of 50 flood events in Bennington County from 1996 to 2017, using NCDC data. These have been primarily minor and affected either specific streams, such as the Batten Kill and the Walloomsac, or specific towns.

Hurricanes and tropical storms that form in tropical waters have historically affected New England, but are relatively infrequent. Besides the 1938 storm, Tropical Storm Belle brought significant rains to Vermont in 1976 and Hurricane Gloria brought rain and wind damage in 1985. Arlington has been subjected to two major tropical storms in the past twenty years. Hurricane Floyd was a Category 4 storm before hitting North Carolina, and then was reduced to a tropical storm when it reached southern New England. Tropical Storm Irene was the remnant of Hurricane Irene, which was a Category 1 hurricane. A category 1 storm has winds of 74-95 miles per hour and could damage roofs, down shallow-rooted trees and damage power lines (http://www.nhc.noaa.gov/aboutsshws.php).

The following describes nine moderate and extreme events that have occurred since 1996, using the National Weather Service (2010) categories, which affected Arlington or nearby areas. These events were described in the National Climate Database records (2015). It should be noted that only the January 1996 event occurred in the winter, with all other events in the spring, summer or fall. Ice jam flooding does occur and one instance of damage is described below.

January 19 to 20, 1996 (DR-1101 1/19 to 2/2 1996): An intense area of low pressure which was located over the Mid-Atlantic region on Friday morning January 19th produced unseasonably warm temperatures, high dew points and strong winds. This resulted in rapid melting of one to three feet of snow. In addition to the rapid snowmelt one to three inches of rain fell as the system moved northeast along the coast. This resulted in numerous road washouts and the flooding of several homes across the county. *Note that this was also categorized as a High Wind event.

April 24, 1996: Significant rains on Tuesday evening April 23 resulted in flooding along the Walloomsac and Batten Kill Rivers in Bennington County. The Walloomsac River crested 1.5

feet over flood stage at North Bennington and the Batten Kill crested one foot over flood stage at Arlington. The flooding resulted in several road closures but much of the flooding was minor.

May 11 to 12, 1996: Rainfall in excess of 2 inches fell during this period over much of Vermont. This resulted in flooding along the headwaters of the Batten Kill near Arlington in Bennington County.

September 16 to 17, 1999 (DR-13079/16-21 1999): The remnants of Hurricane Floyd brought high winds and heavy rainfall (3-6 inches) to southern Vermont. Many smaller tributaries reached or exceeded bankfull. Estimated wind gusts exceeded 60 mph, especially over hill towns. Power outages occurred across southern Vermont. A Cooperative Weather Observer recorded 4.94" of rain in Sunderland.

July 14-17, 2000 (DR- 1336 7/14-18 2000): Thunderstorms caused torrential rainfall with flash flooding washing out sections of roadways in northeast Bennington County and southern Bennington County. Route 7 was closed due to flooding and rockslides and 67 was closed due to flooding. Numerous other roads were closed, with some washed out. This rain produced enough runoff to cause the Batten Kill to exceed the six-foot flood stage by about a foot at Arlington, Bennington County, representing a 47-year high. The swelled river flooded the Batten Kill Canoe Company and adjacent river property. A Cooperative Weather Observer recorded 3.39" of rain in Sunderland.

March 29 to 30, 2003: Up to two inches of rain fell across southern Vermont. The gage on the Batten Kill in Arlington crested at 6.3 feet, which is 0.3 feet above flood stage.

July 21 to 18 August 2003 (DR-1488 7/21-8/18 2003): Severe storms and flooding affected Vermont including Bennington County. (Note: this event does not appear in the NCDC data.) A Cooperative Weather Observer recorded sporadic and sometimes large amounts of precipitation during that period in Sunderland.

March 31 through April 2, 2004: As much as three inches of rain fell from March 31st through April 2nd across southern Vermont. This rain combined with the last of the snow melt to produce an excessive runoff of water. As a result, flooding took place in Bennington County. The Manchester Schools were closed due to flooding. The gage on the Batten Kill River in Arlington, rose to 6.9 feet, nearly a foot above the 6-foot flood stage during the predawn hours of April 3rd.

January 14, 2005: The Batten Kill exceeded the 6.0-foot flood stage at the Arlington gage at 08:06 AM on the 14th.

November 30, 2005: On November 30, widespread rainfall of 1-1.5 inches and snow melt increased river levels resulting in minor flooding on the Batten Kill River at Arlington, Vermont. The river exceeded the 6.0-foot flood stage with a crest of 6.5 feet at 2:00 PM EST.

April 16-17 2007 (DR-1698 4/15-21 2007): An intense coastal storm spread heavy precipitation across southern Vermont, starting as a mixture snow, sleet and rain which changed to all rain. Liquid equivalent precipitation totals ranged from three to six inches leading to minor flooding across portions of southern Vermont. A Cooperative Weather Observer recorded 3.54" of rain in Sunderland. Minor flooding occurred along the Batten Kill in Arlington, where the level crested at 6.80 feet at 05:30 EST on the 17th. This was 0.80 feet above the flood stage of 6 feet. The water level exceeded flood stage at 22:54 EST on the 16th.

August 28-29, 2011 (DR-4022 8/27-29 2011): Tropical Storm Irene produced widespread flooding, and damaging winds across the region. Rainfall amounts averaged four to eight inches and fell within a twelve-hour period. A Cooperative Weather Observer recorded 5.16" of rain in Sunderland. In Bennington County, widespread flash flooding and associated damage was reported countywide, with many roads closed due to flooding and downed trees and power lines. Strong winds also occurred across southern Vermont, with frequent wind gusts of 35 to 55 mph, along with locally stronger wind gusts exceeding 60 mph. The combination of strong winds, and extremely saturated soil led to widespread long duration power outages.

September 7, 2011: Large amounts of moisture from the remnants of Tropical Storm Lee interacted with a frontal system producing heavy rainfall with total rainfall amounts ranging from three to seven inches led to widespread minor to moderate flooding across southern Vermont. A Cooperative Weather Observer recorded 4.63" of rain between September 5th and 9th.

The gauge along the Batten Kill in Arlington is not monitored continuously. In addition to the 2004 record, readings above flood stage occurred on April 1, 1998 (6.35 ft.), January 14, 2005 (6.3 ft.), October 9, 2005 (6.8 ft.), December 10, 2008 (6.0 ft.) and March 31, 2010 (6.5 ft.) (National Weather Service 2016).

c. Extent and Location

The primary damages from past events have been from flooding and fluvial erosion with secondary damage from wind. There have been no NFIP-designated repetitive losses within Arlington. Map 6 shows damages identified during Tropical Storm Irene, which occurred along area roads as well as alteration in river geometry. There were several areas of damage to River Rd. along the Batten Kill and damages occurred along Tory Lane and East Arlington Rd. Twenty-eight bridges and culverts were damaged. Several areas of debris were noted along some streams as well.

In addition to the above events, the Peru, Pownal and Sunderland Cooperative Observer recorded precipitation. Table 6 shows those months by year where that value exceeded the 90th percentile, which varies by site and month. Several events of that magnitude have occurred where flooding was not recorded in NCDC records or local knowledge. High precipitation events could indicate unreported localized flooding events and, therefore, provide additional information on potential flooding extent.

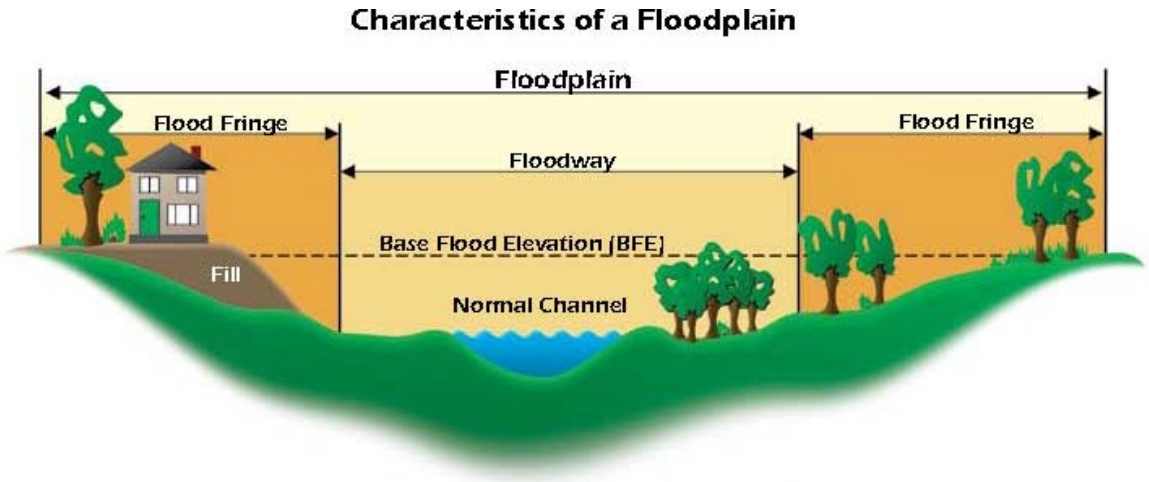
Table 6. Months where rainfall exceeded the 90th percentile (precipitation totals, in inches, in parentheses) of monthly precipitation at the Peru, Pownal and Sunderland Cooperative Observer Stations from 1990 to 2013 for Pownal, 1980 to 2017 for Peru and 1990 to 2013 for Sunderland.

Sunderland		Pownal	Peru
Month	Year	Year	Year
January	1990, 1998, 1999 (5.97")	1996, 1998, 1999, 2006 (3.88")	1990, 1999, 2006, 2012 (5.04")
February	2002, 2008, 2011 (3.58")	1981, 1984, 2008 (3.54")	1981, 2002, 2008, 2016 (5.28")
March	2001, 2007, 2008 (5.35")	1980, 1999, 2001, 2007 (4.65")	1980, 1986, 2001, 2008 (6.13")
April	1993, 1996, 2002, 2007, 2011 (4.75")	1983, 1990, 1993, 1996 (4.80")	1983, 1996, 2007, 2017 (6.43")
May	1990, 2000, 2006 (6.31")	1984, 1990, 2013 (6.47")	1984, 1990, 2012, 2017 (8.29")
June	1998, 2002, 2006 (7.66")	1998, 2000, 2002, 2013 (7.32")	1998, 2006, 2013, 2015 (9.26")
July	1996, 2004, 2008 (6.87")	1984, 2004, 2010 (6.20")	1988. 1996, 2000, 2013 (7.31)"
August	1990, 2003, 2011 (7.37")	1990, 1991, 2003, 2011 (7.37")	1985. 1990, 2003, 2011 (8.32")
September	1999, 2003, 2011 (5.75")	1999, 2004, 2011 (6.03")	1987, 1999, 2003, 2011 (6.92")
October	2005, 2007, 2010 (7.05")	1987, 1995, 2010 (5.81")	1987, 1995, 2010 (9.02")
November	2002, 2004, 2005 (5.28")	1985, 1988, 2005 (5.81")	1983, 1986, 1988, 2002 (6.36")
December	1996, 2003, 2008 (6.42")	1983, 1990, 2003, 2011 (4.77")	1983, 1996, 2008, 2014 (6.74")

The average annual precipitation in Vermont has increased 5.9" since 1960. This trend is predicted to continue so that Vermont streams will have higher flows and possibly experience more frequent and greater flooding events (Galford et al. 2014).

Special Flood Hazard Areas: these are areas mapped by FEMA and using the LIDAR derived zones that were adopted in late 2015. Table 7 shows the number of structures, by type, in the special flood hazard and river corridors, and both areas are shown in Map 5. Figure 1 below shows the parts of a typical floodplain.

Figure 1. Typical floodplain



River Corridors: River corridors (Figure 2) have been mapped by the Vermont Agency of Natural Resources using geospatial data and will be modified by VT ANR river scientists using available field data. The data were used to calculate the "meander belt width" or area within which a river would move across the valley. As rivers shift their location both vertically and horizontally, erosion of adjacent lands can occur and threaten properties that may be outside of special flood hazard areas. The additional buffer allows for placement of structures beyond the meander belt width and provides for space for the changes in river geometry, bank stabilization and establishment of woody buffers to provide resistance to erosion from the movement of the channel (Vermont River Management Program 2010).

Figure 2. River corridors

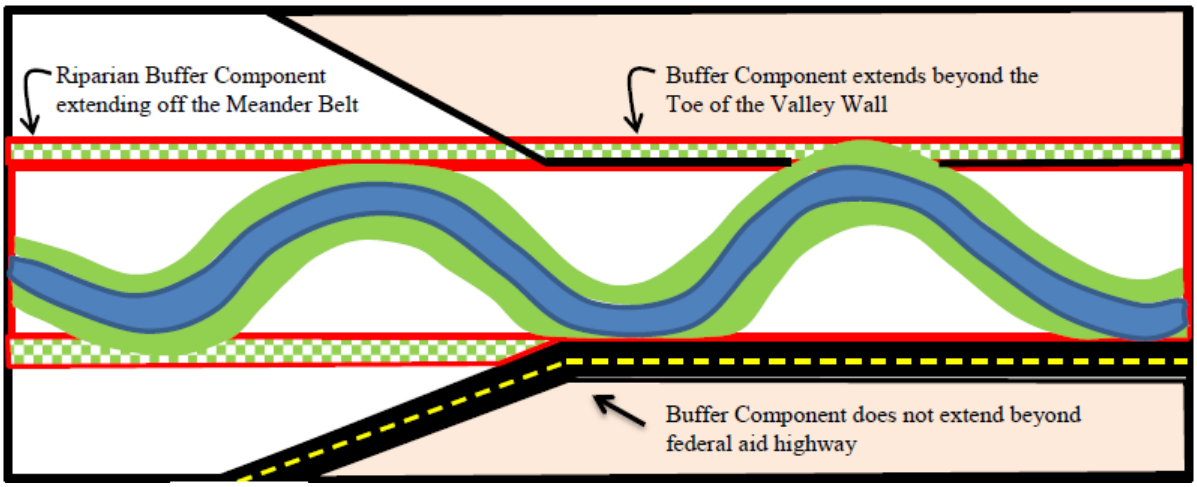


Table 7. Structures by type in flood hazard zones in Arlington, VT.
Source: Vermont Center for Geographic Information www.vcgi.org

Type	Number in special flood hazard zone	River Corridor
Single-Family	48	80
Mobile Home	5	7
Multi-family	1	3
Public Gathering	2	2
House of Worship	0	1
Commercial	4	13
Industrial	0	0
Community Recreation	2	1
Fire Station	0	1
Other	7	14
Camp	0	7
Accessory Building	0	2
Total	69	130

d. Probability, Impact, and Vulnerability

Based on data from 1996 to 2017, 13 moderate or major flood events have affected areas within or near Arlington resulting in a 50-60% chance of such an event occurring. Table 7 tallies the number of structures by type within the river corridor and special flood hazard area. Arlington has a total of 1,053 single family residences, 50 mobile

homes, 34 multi-family dwellings, 105 commercial/industrial establishments, 40 camps, and 19 government, church and school buildings. As shown in Table 7, there are 69 structures in the special flood hazard area and 130 in the river corridor recently mapped by VT ANR, and since these areas overlap, some structures are in both. Therefore, the potential proportion damaged within the town from severe flooding would range from 1-10% with injuries of 1-10%. Most services recover in less than seven days, though help for specific property owners may take significantly longer.

B. Winter Storms

1. Description

Winter storms are frequent in Vermont. Winter storms may consist of heavy snow, mixed precipitation, or ice storms and all may be accompanied by strong winds. Potential damages can include power outages, traffic accidents, and isolation of some areas. For example, the October 4, 1987 storm stranded travelers in the area and knocked out power for several days. Members of the planning team recalled this storm as particularly troublesome as trees still had leaves on, so power outages were extensive. The "Blizzard of ’93," one of the worst storms this century, virtually shut down Vermont on the weekend of March 13-14, forcing the closure of roads and airports. This was one of the most powerful snowstorms on record. Snowfall amounts ranged from 10 to 28 inches across the state. In rare cases, the weight of snow may collapse roofs and cause other structural damage. Wind can also accompany snowstorms increasing the effect of the snow damages. In addition to snow, ice storms occur when the lower levels of the atmosphere and/or ground are at or below freezing, and rain is falling through warmer air aloft. The precipitation freezes upon contact with the ground, objects on the ground, trees and power lines.

Table 8. Total number of winter storm events by type and year for Bennington County.
Source: National Climate Data Center 2015

Year	Blizzard	Heavy Snow	Ice Storm	Winter Storm	Winter Weather	Totals
1996		5		2		7
1997		1		7	2	10
1998				2	1	3
1999				4		4
2000		1		6		7
2001				6		6
2002				2		2
2003				5		5
2004				2		2
2005	1	3		2		6
2006						0
2007		3	1	6	4	14
2008		4	1	1	11	17
2009		3		1	10	14
2010		3		1	2	6
2011				5	5	10
2012				4	2	6
2013		2		1	3	7
2014		2		4		6
2015		2			6	8
2016		1			5	6
2017	1	3		1	7	12
Totals	2	33	2	65	60	162

2. Previous Occurrences

Table 8 summarizes the 162 winter storm events that have occurred in Bennington County since 1996. As can be seen, a high number of events occurred in 1997, 2007, 2008, 2009, 2011 and 2017. Using NCDC data, we categorized the extent of each storm with storms ranked as "High" if they produced more than twelve inches of snow or were categorized by the NCDC as producing heavy or record snows or blizzards or significant icing. The Blizzard of 1993 was categorized as "Extreme." The NCDC also reports numerous storms producing one to over three feet of snow in the Green Mountains, but these were not listed as they did not affect major population centers. The following is a summary of significant events.

January 2 to 3, 1996 Heavy Snow: A major winter storm developed over the Gulf coast states on January 2nd and tracked northeast along the eastern seaboard during January 3rd. Heavy snow fell across southern Vermont with the average snowfall ranging from ten to twelve inches.

November 26, 1996 Winter Storm: Snow and heavy freezing rain brought down trees and power lines with 10,000 customers losing power.

November 17, 2002 Winter Storm: A mixture of snow, sleet and freezing rain, along with strong winds and trees still with leaves resulted in downed trees and powerlines from Arlington to the New York State Line.

January 23, 2005 Blizzard: Frequent whiteout conditions were observed by plow crews.

January 15 to 16, 2007 Ice Storm: Freezing rain and sleet resulted in widespread downed trees and power lines with accompanying widespread power outages.

February 14, 2007 Heavy Snow: Snowfall in excess of two feet across portions of Bennington County resulted in closed schools and businesses. Strong winds created near blizzard conditions during parts of the event.

March 16-17, 2007 Heavy Snow: Widespread snow of 10-18 inches fell across southern Vermont resulting in adverse impacts to travel and businesses.

April 12, 2007 Winter Storm: Heavy, wet snow, ranging from 8-12 inches downed trees and power lines causing widespread outages.

December 16-17, 2007 Winter Storm: Heavy snow mixing with sleet and accumulating 8 to 14 inches resulted in difficult travel and the closing of schools and some businesses Monday morning with some power outages.

February 12 to 13, 2008 Winter Storm: Snow accumulated to 4-7 inches but was accompanied by freezing rain with ¼ to 1/3 of an inch of ice.

December 11 to 12, 2008 Ice Storm: Rainfall in rates of ¼ to 1/3 of an inch/hour fell creating ice accumulations of ½ to ¾ of an inch. Snow and sleet mixed in in some areas. An estimated 15,000 customers lost power and businesses and schools were shut for several days. Very cold temperatures followed the storm.

January 1 to 3, 2010 Heavy Snow: A strong storm brought 10 inches to over two feet of snow across Bennington and Windham counties.

February 23 to 24, 2010 Heavy Snow: Heavy snow totaling one to two feet fell across southern Vermont with highest amounts in elevations above 1500 feet.

February 26 to 27, 2010 Heavy Snow: Just after the storm described above, a second storm brought one to two feet in higher elevations with lesser amounts below 1000 feet in elevation.

December 26 to 27, 2010 Winter Storm: Heavy snow falling at rates of 1-3 inches/hour resulted in one to two feet of snow. Winds were strong and gusted to 35-45 mph.

January 12, 2011 Winter Storm: A strong storm resulted in 14 inches to three feet of snow falling at rates of three to six inches/hour.

February 1 to 2, 2011 Winter Storm: Snowfall was generally 10-18 inches but ranged to 25 inches in some areas.

February 25, 2011 Winter Storm: Snow fell at rates of one to two inches/hour with totals of 12 to 17 inches across southern Vermont.

October 29 to 30, 2011 Winter Storm: While not yet winter and with trees with much of their foliage still on, 5 to 14 inches fell across Bennington County. Trees and power lines came down due to the weight of the wet snow.

January 1 to 2, 2014 Heavy Snow: Widespread snow accumulated 8-17 inches followed by very cold temperatures.

February 13 to 14, 2014 Winter Storm: Snow fell at rates of up to three inches/hour. Over the two days of the storm, 8-21 inches fell in southern Vermont. At times, winds gusted to 40 mph as the storm left the area.

November 26 to 27, 2014 Winter Storm: An early storm affected southern Vermont over the Thanksgiving period with 8-15 inches of total accumulation.

February 2, 2015 Heavy Snow: Snow accumulations ranged from 9-15 inches.

February 7 to 10, 2015 Heavy Snow: One to two feet of snow fell, with higher amounts in higher terrain.

February 9, 2017 Heavy Snow: A Nor'easter left 8-14 inches of snow across Bennington County.

March 14-16, 2017 Blizzard: This significant coastal storm resulted in 18 inches of snow at low elevations and 35 at high elevations. High winds and blizzard conditions resulted in po0r visibility

3. Extent and Location

The National Climate Data Center publishes climate "normals" or averages for various stations including Pownal and Sunderland. The average annual snowfall for the period 1981 to 2020 was 60.8 inches for Pownal and 75.1 inches for Sunderland. December, January, February and March as the primary months for snowfall. Extreme snowfall events for one, two- and three-day events have ranged from 12 to over 20 inches (NOAA/National Climate Data Center 2017 Cooperative Weather Observer reports). The skill of road crews in Vermont means that only the heaviest snowstorms (>12 inches) or ice storms affect the populations.

Increasing temperatures that are predicted to occur will likely reduce total winter snowfall. If precipitation falls as rain in the winter, river flows will be higher due to the lower evapotranspiration in the winter. Freezing rain may become more frequent, with resulting impacts to the transportation and power systems (Galford et al. 2014).

4. Probability, Impact and Vulnerability

There is a 100% probability of a moderate or greater snowstorm affecting Bennington County, including Arlington in any given year. These are large-scale events, though local impacts may vary greatly. Roads and power lines are most vulnerable, with traffic accidents the most likely to create injuries.

C. High Wind Events

1. Description

High wind events can occur during tropical storms and hurricanes, winter storms and frontal passages. Thunderstorms can produce damaging winds, hail and heavy rainfall, the latter potentially producing flash floods. The NCDC recorded 81 thunderstorms with damaging winds in Bennington County since 1996. Events categorized as "strong wind" tended to occur during the winter months.

Tornadoes are formed in the same conditions as severe thunderstorms. Intense, but generally localized damage can result from the intense winds. The primary period for tornado activity in New England is mid-summer (Zielinski and Keim 2003). Tornadoes will generally follow valleys in the northeast and dissipate in steep terrain. The NCDC recorded three tornadoes in Bennington County since 1990.

2. Previous Occurrences

Table 9 below summarizes the total number of significant wind events including thunderstorms, strong winds, and tornadoes from 1996 to 2015. The 1998 tornado registered F2 on the Fujita damage scale. The 2002 tornado in Bennington County registered F1 while the 2003 tornado was an F0 to F1 (National Climate Data Center 2015). The Fujita scale is based on wind speed and typical damage. An F0 tornado has winds of less than 73 miles per hour and could damage chimneys, branches and down shallow rooted trees. An F1 tornado has winds of 73-112 miles per hour and could damage roofs, push mobile homes off foundations and blow cars off of roads. An F2 tornado has winds of 113-157 miles per hour and could tear off roofs, destroy mobile homes and snap trees (http://www.spc.noaa.gov/faq/tornado/f-scale.html).

Wind speed data is not available for most wind events due to the lack of weather stations. The only recording gauge is at the Bennington Airport. NCDC data (2015) rarely included estimates of wind speed. Generally, wind speeds of greater than 55 miles per hour are considered damaging (NOAA 2006). Events that occurred in or near Arlington are described below.

Table 9. Summary of wind events in Bennington County.
Source: National Climate Data Center 2015

Year	High Wind	Strong Wind	Thunderstorm Winds	Tornado	Funnel Cloud	Totals
1996	5					5
1997	2	2	6			10
1998	1		8	1		10
1999	2		4			6
2000	1		1			2

Table 9. Summary of wind events in Bennington County. Source: National Climate Data Center 2015						
Year	High Wind	Strong Wind	Thunderstorm Winds	Tornado	Funnel Cloud	Totals
2001			3			3
2002			3	1		4
2003	1			1		2
2004						0
2005	1		3			4
2006	3		3			6
2007	3		6			9
2008		3	5			8
2009	2		1			3
2010	5		3		1	9
2011	1		8			9
2012			3			3
2013			6			6
2014			3			3
2015			2			
2016		1	7			8
2017	4	3	5			12
Totals	37	9	81	3	1	131

July 15 through 18, 1997 Thunderstorm Winds: Severe thunderstorms downed trees in Dorset, Manchester and Shaftsbury.

May 29 through 31, 1998 Thunderstorm Winds and Tornado: Strong thunderstorms generated an F2 tornado in New York, which became an F1 after crossing into Vermont. The tornado followed Route 67 through North Bennington and South Shaftsbury.

September 16 to 18, 1999 (DR-13079/16-21 1999): Remnants of Hurricane Floyd (see flooding and flash flooding) brought winds gusting to over 60 mph and downed trees and power lines in southern Vermont.

November 2, 1999 High Wind: A wind gust of 66 mph was recorded at the Bennington Airport, though no damages were reported.

July 1, 2001 Thunderstorm Wind: Strong thunderstorm winds downed trees and wires in Arlington.

August 9, 2001 Thunderstorm Winds: A supercell brought down trees in Bennington and Arlington.

June 5, 2002 Thunderstorm Winds and Tornado: Thunderstorms originating in New York produced an F1 tornado that touched down in Woodford Hollow.

July 21, 2003 Tornado: A supercell originating in New York created a tornado there, created a second tornado in Pownal and Bennington. Those, along with thunderstorm winds, downed trees and causing minor damage.

June 6, 2005 Thunderstorm Winds: Trees were blown down in Shaftsbury.

June 27, 2005 Thunderstorm Winds: A thunderstorm near Manchester Center blew down several trees.

April 23, 2006 High Winds: High winds from a low-pressure system uprooted trees in Arlington.

October 28- 29, 2006 High Winds: Strong winds, some reaching 60 mph, blew from the evening of the 28th through parts of the 29th with trees reported down in Sunderland and Arlington.

March 2, 2007 High Winds: High winds were associated with snow and freezing rain. Winds measured at Bennington Morse Airport reached 59 mph.

April 16, 2007 High Winds: Low pressure caused strong winds with 175 downed trees near Route 30 in Dorset.

June 1, 2007 Thunderstorm Winds: Thunderstorms resulted in downed trees near the recreation center on 7A in Arlington.

December 16, 2007 High Winds: A snowstorm brought 8-14 inches of snow along with strong winds that combined to down trees and powerlines.

December 30, 2008 High Winds: Trong wind gusting 45-55 mph brought down trees and caused power outages.

December 9, 2009 High Winds: High winds, measured up to 59 mph at the Bennington Airport, caused power outages in Bennington, Dorset, Manchester, Pownal, Sandgate, Shaftsbury and Sunderland.

May 8, 2010 Thunderstorm Winds: Thunderstorms generated winds in excess of 40 mph downing trees in Arlington and Manchester Center.

July 17, 2010 Funnel Cloud: A funnel cloud was reported on Route 279 in Bennington.

August 22, 2010 High Winds: Strong winds formed during passage of a cold front and downed trees and wires in Arlington, Bennington, Shaftsbury and Sunderland.

September 30 to October 1, 2010 High Winds: a low-pressure system and remnants of an off sure Tropical Storm Nicole created winds gusting to over 55 mph with power outages reported.

May 26, 2011 Thunderstorm Winds: Thunderstorm winds resulted in downed trees in Arlington.

June 9, 2011 Thunderstorm Winds: A pre-frontal trough formed a line of severe thunderstorms that moved across eastern New York and southern Vermont.

August 28-29, 2011 (DR-4022 8/27-29 2011): Along with flooding described above, Tropical Storm Irene brought 35-55 mph winds with gusts exceeding 60 mph resulting in downed trees and powerlines.

October 29 to 30, 2012 High Winds: Superstorm Sandy brought strong winds of 40-60 mph, with a gust of 58 mph recorded at the Bennington Morse Airport.

September 11, 2013 Thunderstorm Winds: Thunderstorm winds downed trees in Arlington.

July 3, 2014 Thunderstorm Winds: Thunderstorms again affected Arlington as well as Dorset.

June 21, 2016 Thunderstorm Winds: Strong storms occurred throughout southern Vermont.

October 22-23, 2016 High Winds: Winds with gusts up to 50 mph affected parts of southern Vermont.

January 10-11, 2017 High Winds: Winds of 40-60 mph caused some power outages in the county.

March 2, 2017 High Winds: Winds of 30-45 mph were widespread across the county.

May 5, 2017 High Winds: Winds up to 68 mph were observed in Bennington.

May 18, 2917 Thunderstorm Winds: Thunderstorms created winds that brought down power lines in some areas.

July 1, 2017 Thunderstorm Winds: A microburst brought down trees in Sandgate. The estimated windspeed based on the damage was 100 mph.

October 30, 2017 High Winds: Winds brought downed trees, limbs and wires across the county.

c. Extent and Location

Damaging winds, including the previous occurrences described above, are those exceeding 55 miles per hour (National Oceanographic and Atmospheric Administration 2006

and undated). During a November 1999 event, winds were measured at 66 mph at the Morse Airport in Bennington. Higher winds were likely created during the tornadoes. High wind events can strike anywhere. Where storms are funneled up the valleys, damage can be significant, but most likely less than 10% of structures would be affected. Again, power outages could last up to seven or more days. There are no weather stations nor any records of wind data in Arlington.

d. Probability, Impact and Vulnerability

Wind events causing moderate or greater damage occur almost every other year (40-50%) in Bennington County, and can range from localized events from thunderstorms to wide ranging events from larger storms. The primary vulnerability would be power outages from downed trees and lines and the potential expected probability would be 10-100% in Arlington.

D. Hail

The National Climate Data Center has 30 reports of hail storms in Bennington County between 1996 and 2015, all associated with thunderstorms. The following were within Arlington.

May 10, 2007 Hail: Quarter sized hail was reported in Arlington.

August 6, 2008 Hail: Quarter sized hail was reported in Arlington.

June 1, 2011 Hail: Half dollar sized hail was reported in Arlington and golf ball sized hail reported in Shaftsbury. Reports of hail were widespread.

Hail was also reported by a Cooperative Weather Observers on May 25, 1999, May 8, 2000, July 18, 2000, July 5, 2001, August 4, 2001, June 2, 2002, August 1, 2008 and August 15, 2009 in Sunderland and on June 10, 2008 and May 8, 2010 in Peru.

c. Extent and Location

Hail can be very localized or can cover wide areas and has the potential for damaging crops, automobiles or glass within structures, as well as causing injury. Generally, however, hail storms affect relatively small areas as they form in thunderstorms, which are localized. Storms with the largest hail stones near Arlington occurred in 2005 during which one-inch hail was reported in Dorset and Rupert.

d. Probability, Impact and Vulnerability

Hail storms are generally local, affecting subareas within the town, though a group of thunderstorms can cause hail in multiple locations over a wide area. From past occurrences, one thunderstorm per year generates hail that was recorded. So, the possibility of hail

occurring in Arlington could range from 10-100%. The potential vulnerability would be localized to damage to structures or automobiles, though there could also be damage to vegetation. In general, these impacts would be localized.

E. Temperature Extremes

1. Descriptions

Temperature extremes entail periods of either excessive heat or extreme cold. Excessive heat is generally defined as periods when the normal high temperature is exceeded by ten degrees. So, in the summer, this would equal 88-89 degrees in Arlington (Table 10). Excessive heat is recorded at other times, but does not have the health consequences of summer periods. In addition, the heat index, which factors in the high relative humidity levels of summer, is also a factor. The Vermont Department of Health has determined that serious heat related injuries and deaths occur when the temperature reaches or exceeds 87^0 F (Vermont Department of Health 2016). Using the Sunderland Cooperative Observer data this occurred 151 times between 1990 and 2017 or about eight time per year.

Extreme cold is not well defined. For those involved in outdoor activities, extreme cold, accompanied by wind, is when exposed skin would be subject to frostbite. However, for periods of power outages that might accompany winter storms, extreme cold could be thought of as when temperatures fall below freezing as that would not only affect health, but could result in pipes freezing and the loss of water supplies.

Table 10. Sunderland normal temperatures and precipitation for 1981 to 2010.
Source: National Climate Data Center: http://www.ncdc.noaa.gov/land-based-station-data/climate-normals/1981-2010-normals-data

Month	High Temperature (^{0}F)	Low Temperature (^{0}F)	Mean Temperature (^{0}F)	Precipitation (in)
January	28.5	9.5	19.0	3.44
February	33.7	11.2	22.5	2.82
March	40.9	19.5	30.2	3.55
April	54.3	31.0	42.7	3.47
May	65.8	41.3	53.5	4.33
June	75.3	49.6	62.5	4.66
July	78.5	54.5	66.5	4.55
August	77.1	53.0	65.0	4.40
September	69.6	44.2	56.9	3.83
October	57.3	34.4	45.8	4.28
November	45.9	27.9	36.9	3.98
December	34.4	17.2	25.8	3.95
Annual	55.1 (Average)	32.8 (Average)	43.9	47.26

The station normal report for the Cooperative Weather Observer in Sunderland indicates an average of one day per year when the maximum temperature would equal 90 degrees, 55 days when the maximum temperature would be less than 32 degrees and 172 days when the minimum temperature would be less than 32 degrees.

2. Extent and Location

Extreme temperature is a widespread phenomenon. The populations affected could be small if one is considering outdoor workers or the entire town in a power outage. Temperatures above 90^0F occur approximately one or two days per year. The highest recorded temperature at the Sunderland Cooperative Weather Observer station was 95^0F on August 24. 2002. High temperatures of 94^0F were recorded on August 15, 2002, and again on July 22 and 23, 2011. The coldest recorded temperatures by the Sunderland Cooperative Weather Observer were -24^0 F on January 28, 2005 with -22^0 F recorded on both January 22nd and 29th in 2005.

Average temperatures in Vermont have risen 2.7^0F since 1941 with an increase of 1.5^0F since 1990. Winter temperatures have risen more than summer temperatures. If these trends continue, the number of days above 90^0F will likely increase and minimum temperatures also increase (Galford et al 2014).

3. Probability, Impact and Vulnerability

Extreme heat is relatively rare with occurrences of approximately less than one day a year. Extreme cold, here defined as less than freezing temperature, is a frequent phenomenon in Vermont. Impacts of either type of event could be widespread, and vulnerability is dependent on the populations exposed.

F. Drought

1. Description

There are several types and definitions of drought: meteorological, climatological, atmospheric, agricultural and hydrological. The latter is based on stream flow and groundwater availability and is probably most important from a natural hazard assessment perspective. Reductions in precipitation over long enough periods, particularly during the growing season when plants take up moisture, can result in hydrologic drought.

2. Past Occurrences

The Palmer Hydrologic Drought Index (PHDI) is an indicator of potential surface and groundwater availability based on climatic conditions. The categories of drought include

Table 11. Years and number of months when the PHDI indicated severe or extreme droughts from 1895 to 2016.
Source: National Climate Data Center. Source: ftp://ftpncdd.noaa.gov/pub/data/cirs/climdiv/ (Richard Heims, personal communication)

Year	Extreme	Severe
1901		
1905		
1907		1
1908	2	1
1909	1	2
1910		2
1911	5	4
1912		2
1913		5
1914		5
1915	3	1
1921		2
1922		1
1930		1
1931		1
1941		5
1942		2
1949		1
1953		2
1957		1
1959		1
1963		3
1964	1	6
1965	8	1
1995		2
1999		1
2001	2	1
2002	1	1
2016		1
Total	23 months; 8 years	59 months; 27 years

moderate drought, severe drought and extreme drought. Table 11 shows periods when the index showed severe and extreme droughts using data from 1985 to 2014. No drought conditions were recorded from 2003 through 2015. However, members of the planning team reported that some wells were low in 2015, which did have some months with moderate drought conditions.

3. Extent and Location

The National Climate Data Center calculates this index back to 1895. Since then, severe droughts occurred in 27 years or 21% while extreme drought occurred in 8 years or 7%. Severe and extreme droughts have been of short duration, except occurrences in the early 1960s. Mild to moderate droughts have been more frequent. Severe and extreme droughts are likely to affect those properties with shallow wells. Based on well data from VT ANR, there seven public systems and 41 private wells have a depth of less than 100 feet. Map 7 shows private and public water supplies. The major public water source well is actually in Sunderland.

4. Probability, Impact and Vulnerability

The water supply system for Arlington consists of private wells, several public systems, also from wells, including the recently acquired Arlington Public Water System. This system serves the Villages of Arlington and East Arlington, and the Chiselville area of Sunderland, and therefore a substantial portion of the town's population and businesses. The well is actually in the Town of Sunderland (Map 7). The

secondary supply is spring fed on Red Mountain (backup) Data from the Vermont Geoportal indicates other public systems serve Mack Molding, Quadra Tek, Camping on the Battenkill, the Battenkill Valley Health Center, Dollar General, and several restaurants.

Source protection areas were mapped by the Vermont Agency of Natural Resources and are primarily dependent on topography. In 1989 Lincoln Applied Geology provided a report recommending expansion of the area needed to protect the Arlington Water Company well head (Map 7). Identification and protection of the recharge areas for the Town's public water supplies are of paramount importance. There are also wells serving Mack Molding and Quadra Tek that have source protection areas.

Based on the Palmer Drought Severity data, there is a 21.5% chance of a severe or extreme drought occurring in any one year. Except for long-term drought, most wells should supply sufficient water, though structures with shallow wells are most likely to be affected. Drought may affect the potential for wildfire, which is discussed below. Increasing temperatures or changes in precipitation patterns due to climate change may affect the frequency, length and degree of drought.

G. Wildfire

1. Description

Wildfire or wildland fire is any unplanned fire affecting open lands including forests, grasslands or other features. The potential for wildland fire is dependent on fuel types, which vary with vegetation, topography and weather. Fire intensity, measured by the amount of energy released in a fire and exhibited by the length of flames, and rates of spread dictate the degree of wildland fire hazard and methods of control. Table 12 shows how wildfires can be categorized based on size.

Table 12. Wildland fire size classes.
Source: National Wildfire Coordinating Group 2011

Magnitude (Size)	Description	Probability
Class A	< ¼ acre	High
Class B	¼ to 10 acres	High
Class C	10 to 100 acres	Moderate
Class D	100 to 300 acres	Low
Class E	300 to 1000 acres	Very low
Class F	1000 to 5000 acres	Very low
Class G	>5000 acres	Very low

In Vermont, forests tend to be dominated by northern hardwood species such as sugar maple (*Acer saccharum*), birch (*Betula* spp.), white pine (*Pinus strobus*) and hemlock (*Tsuga canadensis*). These species tend to create relatively low flammability fire, so that surface fires

have low intensity and rates of spread, thereby limiting fire hazard (Anderson 1982). Most of the land area in Arlington is covered by broadleaf litter fuels that exhibit fires of low intensity and slow rates of spread.

In both forested and open settings, structures may be threatened by even small wildfires. These wildland-urban interface areas are the most likely areas where resources will be needed to suppress wildland fire and to reduce potential hazards.

Fire behavior is most extreme during periods when the relative humidity is low, generally less than 35-45%. These conditions are most prevalent in the spring, following snow melt, between March and late May or early June. After that, vegetation becomes increasingly green, and the resulting moisture in the live vegetation (fuel) reduces flammability significantly. Precipitation and evapotranspiration increase ambient relative humidity levels so that fires in the summer are generally rare and limited in size.

Fall again brings drying fuels and weather conditions increasing fire hazard. However, relative humidity levels increase after dark, and shorter days also limit the amount of time for fuels to dry and intense, fast moving fires to occur (North Central Research Station 2005).

Arlington likely has some structures within the "wildland urban interface," which represents areas where structures directly abut wildland fuels (Federal Register 2001). These areas have not been mapped.

2. Past Occurrences

According to records from the Vermont Department of Forests, Parks and Recreation, from 1992 to 2015, 179 wildfires occurred in Bennington County, of which 16 occurred in the Arlington. All except three were less than were less than one acre. One of those three burned 39 acres in Black Hole Hollow.

3. Extent and Location

Low intensity fires with relatively slow rates of spread could occur in the forested areas which comprise most of Arlington's land cover. Fires on steep slopes could present control problems due to terrain and as fire will spread more rapidly. Throughout the town there may be pockets of heavier fuel loads, such as brush, or more flammable fuels, such as cured herbaceous vegetation and shrubs. These areas are generally located in the valleys near developed areas.

4. Probability, Impact and Vulnerability

Map 8 shows wildfire risk, as determined by the Vermont Department of Forests, Parks and Recreation (2010) and mean fire return interval from LANDFIRE. For most of the forested

area, the return interval exceeds 100 years, meaning that the natural return interval is relatively long. This return interval is shorter for areas dominated by herbaceous vegetation in the fields within valley, and these areas tend to be the locations of the small, more frequent brush fires that are suppressed by the Arlington Fire Department. Overall the wildfire risk is low or nonexistent, especially in developed areas where there is little or no fuel.

The area deciduous and coniferous forests create litter that is relatively low in flammability so that wildfires have relatively low intensity and rates of spread. The main hazard is for wildland fire fighters working in steep terrain. The natural fire return intervals in most forests in Vermont are more than 50 years and greater as shown in Map 8 (Malamud et al. 2005). Recurrence is likely related to precipitation rather than the buildup of fuels, so drought recurrence is already factored into these interval estimates. Therefore, the potential for large fires is very limited due to the fuel characteristics. However, large roadless areas and steep topography can make suppressing wildland fires that do occur very difficult. Settled areas have a low vulnerability to fire.

H. Earthquake

1. Description

Vermont has no active faults, but has experienced minor earthquakes. Table 14 below shows the most recent occurring within the state, though there have been others, located outside, that have been felt in Vermont (Springston and Gale 1998). The U.S. Geological Survey predicts a two percent probability of an earthquake causing considerable damage in Vermont sometime in the next 50 years (Springston and Gale 1998).

2. Past Occurrences

Data from the Weston Observatory at Boston College (Northeast Earthquake Maps and Catalog) was used to identify earthquakes occurring within 100 miles of Arlington since 1990. No earthquakes occurred in either Arlington or Bennington County during that period. Figure 3 below plots the number of earthquakes by year by magnitude, which is described in Table 13 below.

Table 13. Earthquake magnitude and intensity scale descriptions.
Source: http://earthquake.usgs.gov/learn/topics/mag_vs_int.php

Magnitude	Modified Mercalli Intensity	Description
1.0-3.0	I	I. Not felt except by a very few under especially favorable conditions

Table 13. Earthquake magnitude and intensity scale descriptions. Source: http://earthquake.usgs.gov/learn/topics/mag_vs_int.php		
Magnitude	Modified Mercalli Intensity	Description
3.0- 3.9	II-III	**II**. Felt only by a few persons at rest, especially on upper floors of buildings. **III**. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck.
4.0-4.9	IV-V	**IV**. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably. **V**. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5.0-5.9	VI-VII	**VI**. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. **VII**. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6.0-6.9	VII-IX	**VII**. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken. **VIII**. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. **IX**. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.

Table 13. Earthquake magnitude and intensity scale descriptions. Source: http://earthquake.usgs.gov/learn/topics/mag_vs_int.php		
Magnitude	Modified Mercalli Intensity	Description
7.0 and higher	VIII or higher	**VIII**. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. **IX**. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations. **X**. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. **XI**. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. **XII**. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Figure 3. Plot of earthquake and magnitude for occurrences within 100 miles of Bennington County, VT. Source: Northeast Earthquake Maps and Catalog 2015

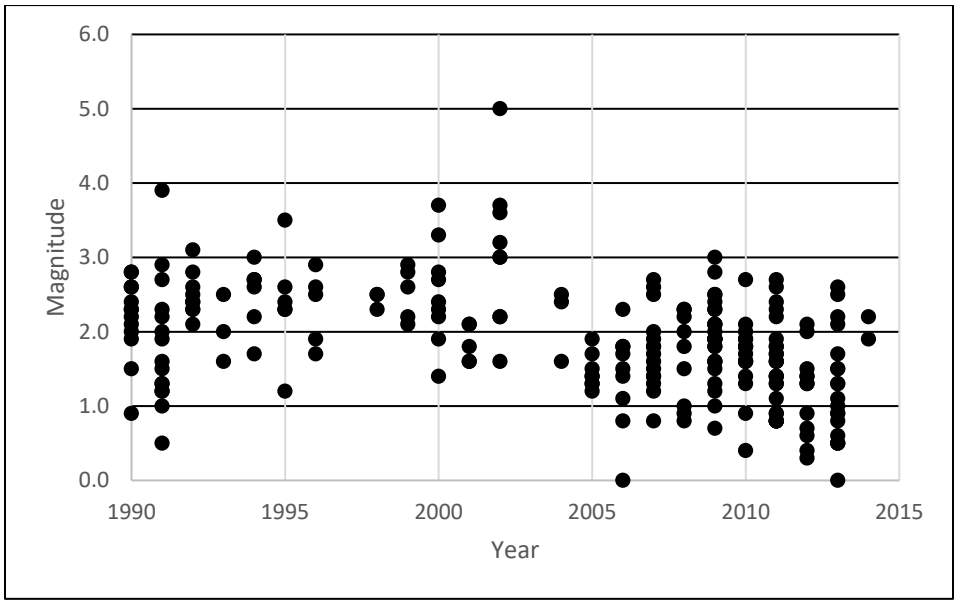


Table 14. Earthquakes in Vermont. Source: Vermont Geological Survey (Ebel et al. 1995) http://www.anr.state.vt.us/dec/geo/EBEL.htm consisting of excerpts from: A Report on the Seismic Vulnerability of the State of Vermont by John E. Ebel, Richard Bedell and Alfredo Urzua, a 98-page report submitted to Vermont Emergency Management Agency in July, 1995.			
Location	Date	Magnitude	Mercalli Intensity
Swanton	July 6, 1943	4.1	Felt by nearly everyone; many awakened with some dishes and windows broken and unstable objects overturned
Brandon	March 31, 1953	4.0	Felt indoors by many, but by few outdoors. Sensation would be similar to a heavy truck striking a building
Middlebury	April 10, 1962	4.1	Felt by nearly everyone; many awakened with some dishes and windows broken and unstable objects overturned

3. Extent and Location

Table 14 shows earthquakes that have occurred in Vermont based on the 1995 report. No earthquakes have been recorded in Arlington or in Bennington County. Those occurring within 100 miles have ranged in magnitude from barely registered to 5.0, with most in the range of 1.0 to 3.0 (Figure 3). No damage was recorded in any of these in Arlington. In 2003, the Vermont Geological Survey completed simulations using FEMA HAZUS software of potential damage within Bennington County from a 500-year recurrence earthquake centered in Middlebury, VT, Tamworth, NH and Goodnow, NY. The results indicated minimal damage and injury from any of these events to Arlington (Kim 2003).

d. Probability, Impact and Vulnerability

Based on the 2003 HAZUS analyses, both the probability and impact of an earthquake of a magnitude that could potentially occur in Vermont are low. However, earthquake prediction science is very limited.

I. Landslide

1. Description

Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Gravity is the force driving landslide movement. Factors that allow the force of gravity to overcome the resistance of earth material to landslide movement include saturation by water, steepening of slopes by erosion or

construction, and alternate freezing or thawing. Table 15 shows how landslides can be categorized.

Table 15. Landslide and debris flow types.
Source: USGS 2006

Magnitude	Description	Probability
Localized	Falls: abrupt movements of rocks and boulders, generally on steep slopes	Low to moderate
Topples	Topples: movements involving some forward rotation as material moves downhill	Low to moderate
Flows	A range of land movement generally involving a mass of loose soil, rock, organic matter, air and water moving downhill rapidly and possibly covering a wide area One form called creep involves slow movement of material and is often recognizable by trees growing so as to remain vertical while bent near the ground as they grow to keep up with the slow material flow.	Highly variable but can be fairly common.

2. Past Occurrences

No landslides were reported during Tropical Storm Irene and none have been reported from previous storm events. A landslide occurred on Mount Equinox in 2000 (Rick Ladue, personal communication), but did not threaten any settled areas or roads. A small landslide also occurred in early 2019 on NYS 313. Eleven rockfall areas were identified by the Vermont Agency of Transportation (Eliason and Springston 2007).

3. Extent and Location

Using a protocol developed for the Vermont Geological Survey (Clift and Springston 2012), Dale (2015) used geographic information system data and analyses to develop a potential landslide map for the town. Map 9 shows that the areas of medium and high potential for landslides are primarily on the steeper slopes. There are only very limited areas of high landslide potential, and these far from settled areas, the road system and other infrastructure. Eleven rockfall areas are also shown on Map 9, and all are along VT 313. Four are ranked “B” and could fail and reach 313. The others are ranked C and are unlikely to fail.

4. Probability, Impact and Vulnerability

Map 8 shows few areas of high potential for landslides, so the probability of those affecting settled areas is low and therefore the potential impact and vulnerability are both low. The potential for rockfalls is limited as well.

J. Invasive Species

1 Descriptions

Invasive species are organisms that are not native to a geographic area and which can or do cause economic or environmental harm. Invasive species are characterized by organisms that spread rapidly, can displace native species, and have few or no predators to keep their populations in check. At the same time, they have characteristics that may reduce the value and use of natural resources. For example, bush honeysuckle can become a dominant shrub in some forests reducing the potential for tree regeneration. Japanese knotweed colonizes stream banks, and does hold soil well, leading to increased streambank erosion (Vermont Invasives 2016).

Vermont has two invasive species lists: Class A species are on the Federal Noxious Weed List but are not known to occur in Vermont. These are listed in 7 C.F.R. 360.200, a section of the Code of Federal Regulations. Class B species are known to occur in the state and are considered a threat (Table 17). The table also indicates species observed in Arlington.

Table 16. Designated Class B noxious weeds in Vermont.
Source: Vermont Agency of Agriculture, Food and Markets*:* http://agriculture.vermont.gov/plant_pest/plant_weed/invasive_noxious_weeds/noxious_weeds_list Those with a * have been identified in Bennington County. Source: Early Detection and Mapping System: http://www.eddmaps.org/tools/query/;
Those marked with ** have been identified within the Town of Arlington. Sources: Mary Beth Deller, USFS provided data; Fitzgerald Environmental Associates road surveys; Michael S. Batcher observations
Those marked with an (A) are also on the aquatic invasives list (Table 18).

Scientific Name	Common Name
*Acer ginnala**	Amur maple
*Acer platanoides**	Norway maple
*Aegopodium podagraria** **	Bishop's goutweed or goutweed
Ailanthus altissima	Tree of heaven
*Alliaria petiolata** **	Garlic mustard
*Berberis thunbergii** **	Japanese barberry
*Berberis vulgaris** **	Common barberry
Butomus umbellatus (A)	Flowering rush
*Celastrus orbiculatus** **	Oriental bittersweet

Table 16. Designated Class B noxious weeds in Vermont.
Source: Vermont Agency of Agriculture, Food and Markets: http://agriculture.vermont.gov/plant_pest/plant_weed/invasive_noxious_weeds/noxious_weeds_list Those with a * have been identified in Bennington County. Source: Early Detection and Mapping System: http://www.eddmaps.org/tools/query/;
Those marked with ** have been identified within the Town of Arlington. Sources: Mary Beth Deller, USFS provided data; Fitzgerald Environmental Associates road surveys; Michael S. Batcher observations
Those marked with an (A) are also on the aquatic invasives list (Table 18).

Scientific Name	Common Name
*Euonymus alatus** **	Burning bush
*Fallopia japonica** **	Japanese knotweed
Hydrocharis morsus-ranae (A)	Frogbit
*Iris pseudacorus** ** (A)	Yellow flag iris
Lonicera japonica	Japanese honeysuckle
*Lonicera maackii ** **	Amur honeysuckle
*Lonicera morrowii** **	Morrow honeysuckle
*Lonicera tatarica**	Tartarian honeysuckle
*Lonicera x bella**	Bell honeysuckle
*Lythrum salicaria** ** (A)	Purple loosestrife
*Myriophyllum spicatum** (A)	Eurasian watermilfoil
Najas minor	European naiad
Nymphoides peltata (A)	Yellow floating heart
*Phragmites australis** (A)	Common reed
Potamogeton crispus (A)	Curly leaf pondweed
*Rhamnus cathartica** **	Common buckthorn
*Rhamnus frangula** **	Glossy buckthorn
*Trapa natans** (A)	Water chestnut
Vincetoxicum nigrum	Black swallow-wort

The bush honeysuckles (*Lonicera* spp.) have been observed along roadsides. Buckthorn (*Rhamnus cathartica*) and Japanese barberry (*Berberis thunbergii*) have invaded forests and wetland edges and Japanese knotweed (*Fallopia japonica*) has invaded stream banks and other disturbed areas. Table 18 shows aquatic invasive species listed by the Vermont Agency of Natural Resources.

In addition to the species listed above, the following are should be considered invasive species:

Wild parsnip (*Pastinaca sativa*) is abundant along roadsides and can cause skin burns when chemicals in the plant on exposed skin interact with sun, which can harm those who work on or along roads or utility rights of way. Cow parsnip or wild chervil (*Anthriscus sylvestris*) also dominates roadsides and can invade meadows. Reed canary grass (*Phalaris arundinacea*) has

been observed in Arlington and can invade wetlands and crowd out native plants and has been observed. Multiflora rose (*Rosa multiflora*), while not listed as an invasive, is an invasive species in many states and has invaded road sides and areas along the Batten Kill.

Table 17. Aquatic invasive species in Vermont.
Source: Watershed Management Division, Department of Environmental Conservation: http://dec.vermont.gov/watershed/lakes-ponds/aquatic-invasives/

Scientific Name	Common Name
Dreissena polymorpha	Zebra mussel
Alosa pseudoharengus	Alewife
Orconectes rusticus	Rusty crayfish
Didymosphenia geminata	Didymo
Bythotrephes longimanus	Spiny Waterflea
Corbicula fluminea	Asian clam
Didymosphenia geminata	Didymo[1]
Nitellopsis obtusa	Starry Stoneword
Myriophyllum heterophyllum	Variable-leaved Watermilfoil

2. Past Occurrences

Invasive species are present and represent a continuous hazard that will vary with their abundance and their impacts on structures and infrastructure.

3. Extent and Location

The extent of invasive plants in Arlington and in Bennington County has not been fully mapped. Surveys have been completed for hydrologically connected road segments as part of road erosion surveys by Fitzgerald Environmental Associates (2018). Those surveys evaluated the presence/absence of the following species:

Table 18. Invasives along hydrologically connected roads. Source: Fitzgerald Environmental Associates 2018
Aegopodium podagraria (goutweed)
Alliaria petiolata (garlic mustard)
Celastrus orbiculata (Oriental bittersweet)
Euonymus alatus (burning bush)
Fallopia japonica (Japanese knotweed)
Iris pseudacorus (yellow flag iris
Lonicera spp. (bush honeysuckle
Lythrum salicaria (purple loosestrife
Pastinaca sativa (wild parsnip)

[1] Recently this species has been determined to be native, but that status may change.

Table 18. Invasives along hydrologically connected roads. Source: Fitzgerald Environmental Associates 2018
Phalaris arundinacea (reed canarygrass
Phragmites australis (common reed)
Rhamnus cathartica (common buckthorn
Rhamnus frangula (glossy buckthorn
Rosa multiflora (multiflora rose)

These along with Japanese barberry (*Berberis thunbergii*) were common in surveys of the Batten Kill and tributaries (Marybeth Deller, USFS, personal communication).
Wild parsnip, bush honeysuckle, and multiflora rose were each found on over 100 of the 621 road segments evaluated. Oriental bittersweet was found on 79 segments and others on less than 25 segments. The locations of infested road and river segments are shown on Map 10.

Insects and pathogens have the potential for dramatically altering the composition and structure of forests as well as affecting trees in settled areas. Hemlock wooly adelgid (*Adelges tsugae*) has dramatically reduced hemlock trees south of Vermont and has been found in Pownal, VT. Emerald ash borer (*Agrilus planipennis*) is a significant threat to forests as it kills all ash species. Borers are often dispersed through movement of firewood. Emerald Ash Borer was recently found in Stamford and Pownal.

In addition to the above insects, there are other insects and pathogens that are affecting Vermont forests. These may constitute an emerging hazard (Schultz et al 2015). Climate change may increase the abundance and ranges of forest pest species such as hemlock wooly adelgid and invasive species currently found in more southerly locations (Rustad 2012).

4. Probability, Impact and Vulnerability

The likelihood of increased abundance of invasive species is 75-100% and potential impacts to forested areas are very high. Invasive insects that can cause tree death, particularly the emerald ash borer, could result in road closures, power outages and property damage. Increases in the abundance of invasive plant species could limit regeneration of native trees and shrubs and affect the long-term integrity of the forests (Vermont Department of Forests, Parks and Recreation 2010, Vermont Invasives 2016).

K. Hazardous Material Spill

1. Descriptions

Hazardous wastes are materials that are flammable, corrosive, toxic, or labeled with warning or caution labels. These materials are used in industry, in the home or on farms and are transported regularly.

2. Past Occurrences

The Vermont spill site list indicates there have been 58 spills reported in Arlington since 1978, and these are listed in Table 18 below.

3 Extent and Location

All of the spills listed in Table 18 affected small sites or areas. US Route 7, though not in the town, VT Route 7A and VT Route 313 carry substantial traffic, and a spill on these roads could affect a large portion of the town. Of particular concern in any hazardous materials spill would be the impact on water resources. Map 9 shows the transportation system in relation to surface waters including streams and wetland and groundwater protection areas. Hazardous intersections have been identified by the Vermont Agency of Transportation and the planning committee. Roads with average grades greater than 10% also present hazards, particularly when roads are wet or during winter storms.

4. Probability, Impact and Vulnerability

Given the number of past spills, hazardous materials spills occur less than annually and affect very small areas. Increased truck traffic also increases the possibility of a major spill. However, many areas are vulnerable due to the extensive transportation system and proximity of surface and groundwater resources to that system. Most hazardous materials are transported via US Route 7. However, all local roads carry materials that could spill and affect aquatic resources as well as individual wells.

The overall likelihood of a hazardous materials spill on an annual basis is probably between one and ten percent. Injuries, except in the case of direct injuries from a traffic accident, are likely low. However, the long-term impacts of a spill could be extensive if aquatic resources and/or water supplies were affected.

Table 19. Hazardous materials spills in Arlington, VT
Source: Vermont Department of Environmental Conservation Spills Database: http://dec.vermont.gov/waste-management/spills

Complaint#	Facility Name	Address	Year	Product	Nature of Incident	Quantity	Responsible Party
WMD021	Roadside	574 Bald Mountain Road	2018	Hydraulic Oil,	Hydraulic Equipment Failure	3 Gallons	GMP
WMD223	Hosley Residence/Farm	109 Ice Pond Rod	2018	Gasoline,	Out-of-service 500-gal gasoline UST removal	Unknown	Mike Hosley
WMD276	McAllister Residence	59 Salter Hill Road	2018	#2 Fuel Oil,	Heating Oil UST leak	unknown --	Kathleen McAllister
WMD130	Roadside	Route 7 Exit 3	2017	Diesel, Gasoline,	Vehicle/Equipment accident, cargo lost	unknown	S.L Dudley Transportation, Inc.
WMD430	Chem Clean Center	4095 Route 7A	2017	Diesel, Kerosene,	PCS discovered during tank pull	Unknown --	Chem Clean Center - Tshorn Enterprises, LLC.
WMD552	Roadside	505 East Arlington Road Line 2, Pole 13-1	2016	Not listed	Capacitor and Transformer	20 Gallons	GMP
WMD564	Cutleaf Maples Motel	3420 Vt Route 7A	2014	Not listed	Heating Oil UST leak	unknown	Cutleaf Maples Motel
WMD589	St. Onge Residence	111 Walnut Court	2013	Not listed	Solvent odor coming from cracks in basement	--	Unknown
WMD001	Stewart's Shop	3784 VT RT 7A	2012	Not listed	customer locked nozzle on with gas cap	1 Gallons	Stewart Shops
WMD003	Eastern Savings Bank Residential Property	1654 RT 313 W	2012	Not listed	copper piping stolen causing release	unknown Gallons	Eastern Savings Bank
WMD110	roadway	RT 313 - 1/2 mile west of Dowling Rd	2011	hydraulic & motor oil	VTrans plow truck roll-over	unknown	VTrans

Table 19. Hazardous materials spills in Arlington, VT
Source: Vermont Department of Environmental Conservation Spills Database: http://dec.vermont.gov/waste-management/spills

Complaint#	Facility Name	Address	Year	Product	Nature of Incident	Quantity	Responsible Party
WMD178	roadside	intersection of RT 313 & Warm Brook Rd	2011	Hydraulic oil	blown hose on compressor	1 Gallons	CVPS
WMD589	Dorothea Whitley	245 VT Route 313 West	2011	Not listed	TSIRENE - Fuel oil and water in basement.	unknown	Dorothea Whitley
WMD037	Miles Lumber (Farrar) Property	162 Chittenden Drive	2010	Not listed	AST release	100 Gallons	Miles Lumber
WMD206	Stewarts Shop #193	3784 VT Rte. 7A	2010	gasoline	bad fill port on vehicle	3 Gallons	Stewarts Shops
WMD209	Cherbonneau Residence	88 E Arlington Rd, Apt 1	2010	Not listed	bad odor		N/A
WMD455	Guasatamachio Residence	531 Buck Hill RD	2010	#2	fuel delivery hose release	5 Gallons	Davey Oil
WMD558	roadside	88 Bentley Lane	2010	MODF	transformer release	10 Gallons	CVPS
WMD630	roadway	Rte. 7A South	2010	hydraulic oil	blown hose	20 Gallons	VTrans
WMD599	Roadside	190-208 Berwal Rd.	2009	MODF	Transformer down	1 Gallons	CVPS
WMD303	Green River; Battenkill River	3775 Rte. 313 West	2008	unknown odorless sheen	dark brown sludge/silt	--	N/A
WMD322	N/A	Rte. 7 A	2008	diesel	leaking fuel tank	3 Gallons	N/A
WMD491	Miles Fuels	178 Chittenden Drive	2008	petroleum	Contaminated groundwater and soil	Not listed	N/A
WMD206	Stewarts Shop	3874 Rte. 7A	2007	gasoline	vehicle struck dispenser	20 Gallons	Stewarts
WMD269	Joan Nash Residence	700 Sunrise Lane	2007	#2	AST line leak	20 Gallons	Joan Nash
WMD282	N/A	Rte. 7A, Dunham Rd	2007	asphalt	dump truck load of asphalt overturned	Not listed	Ash Co
WMD316	N/A	2577 River Rd	2007	transformer oil	tree fell on pole	3 Gallons	CVPS
WMD010	N/A	357 South Rd	2006	transformer oil	transformer spill	2 Gallons	CVPS
WMD064	N/A	Route 7A	2006	antifreeze	vehicle accident	1 Gallons	CVPS
WMD130	CVPS transformer	Rt 7 A	2006	non-PCB oil	transformer leak	2 Gallons	CVPS

Table 19. Hazardous materials spills in Arlington, VT
Source: Vermont Department of Environmental Conservation Spills Database: http://dec.vermont.gov/waste-management/spills

Complaint#	Facility Name	Address	Year	Product	Nature of Incident	Quantity	Responsible Party
WMD330	Candle Lake Motel	Rt 7A	2006	#2	overfill of AST	6 Gallons	Suburban Energy
WMD540	N/A	Old West Rd	2006	transformer oil	2 transformers down	20 Gallons	CVPS
WMD225	Stewarts Convenience Store	3784 Rt 7A	2005	gasoline	customer overfill	2 Gallons	Stewarts
WMD367	Nancy Simpson Residence	4087 Rt 313 West	2005	heating oil	Leaking UST	--	N/A
WMD086	N/A	Ball Mountain Rd	2004	Unknown	dumping	Not listed	Unknown
WMD149	Stewarts Shop	3784 Vt Rt 7 A	2004	gasoline	customer overfill	2 Gallons	Stewarts
WMD208	Stewarts	3784 Rt 7A	2004	gasoline	customer overfill at pump	4 Gallons	Stewarts
WMD276	Trumbell Simmons	58 Walker Meadow	2003	#2	leaking heating oil UST	Not listed	Simmons
WMD308	Stewarts Shop	3784 Vt Rt 7A	2003	gasoline	hose failure	3 Gallons	N/A
WMD267	Phyllis Warren Property	61 Borough Rd	2002	#2	AST release	Not listed	Phyllis Warren
WMD325	Mack Molding	E Arlington Rd	2002	coolant oils	waterline break in pressroom	Not listed	Mack Molding
WMD179	N/A	32 Bridal Path	2001	tires, oil, solid waste	trash thrown over bank	Not listed	N/A
WMD433	N/A	Old West Rd	2001	mineral oil (non-PCB)	transformer leak	5 Gallons	CVPS
WMD397	Federated Church	Ice Pond Rd	1999	#2	AST overfill	15 Gallons	Johnson Fuels
WMD421	Ramona Barnes Residence	151 Old Mill Rd	1999	septage	septic system failure	Not listed	N/A
WMD096	Thomas Property	1023 E Arlington Rd	1998	#2	Above Ground Tank Failure	150 Gallons	Dave Thomas
WMD132	N/A	560 Warm Brook Rd	1996	#2	Basement Tank Tipped Over pumped To Ditch	80 Gallons	N/A
WMD318	Andrea Sweet Residence		1996	Gasoline	Contractors Truck Leaked to Driveway	2 Gallons	Winfield Gates

Table 19. Hazardous materials spills in Arlington, VT
Source: Vermont Department of Environmental Conservation Spills Database: http://dec.vermont.gov/waste-management/spills

Complaint#	Facility Name	Address	Year	Product	Nature of Incident	Quantity	Responsible Party
WMD010	N/A	Buck Hill Rd	1995	Petroleum	Possible Petro In Well	Not listed	N/A
WMD144	N/A	Rt 313	1994	Unknown	Oil Cans Found by Road	Not listed	N/A
205	Hughes Body Working	Maple Hill Rd	1992	Paints, Thinner	Body Shop Contamination	Not listed	Hughes Body Working
292	Miles Lumber		1992	Kerosene	Transfer Spill	1 Gallons	Merrill Transport
224	N/A	Rt 7 South of Arlington	1991	Unknown-white, semi-solid	Material Dumped by Road	20 Gallons	N/A
042	N/A	New Route 7	1990	Unknown	Unknown	Not listed	Unknown
202	N/A	Route 7	1990	Hydraulic Fluid	Hose Broke on Bulldozer	Not listed	Cummings Earthmovers, Inc.
226	N/A	Rte. 313, Green River	1990	Diesel Fuel	Truck in River	Not listed	Nabisco Co.
237	Arlington Town Garage		1989	#2 Fuel Oil	Tank Leak	Not listed	Town of Arlington
207	N/A	Miles Lumber	1988	#2 Heating Oil	Overfill	Not listed	Miles Lumber
146	N/A	Rt 7a	1983	Fuel Oil	Accident	800 Gallons	Dorr Oil Co
148	N/A		1982	# 2	Oil Delivered to Wrong Place	1100 Gallons	Miles Lumber
153	N/A		1981	Gas & Oil	Car/truck Accident	7 Gallons	N/A
204	N/A		1981	Diesel	Truck Accident	50 Gallons	N/A
057	N/A	S. G. Phillips	1978	Diesel	Tank Overfill	50 Gallons	S.g. Phillips

L. Infectious Disease Outbreak

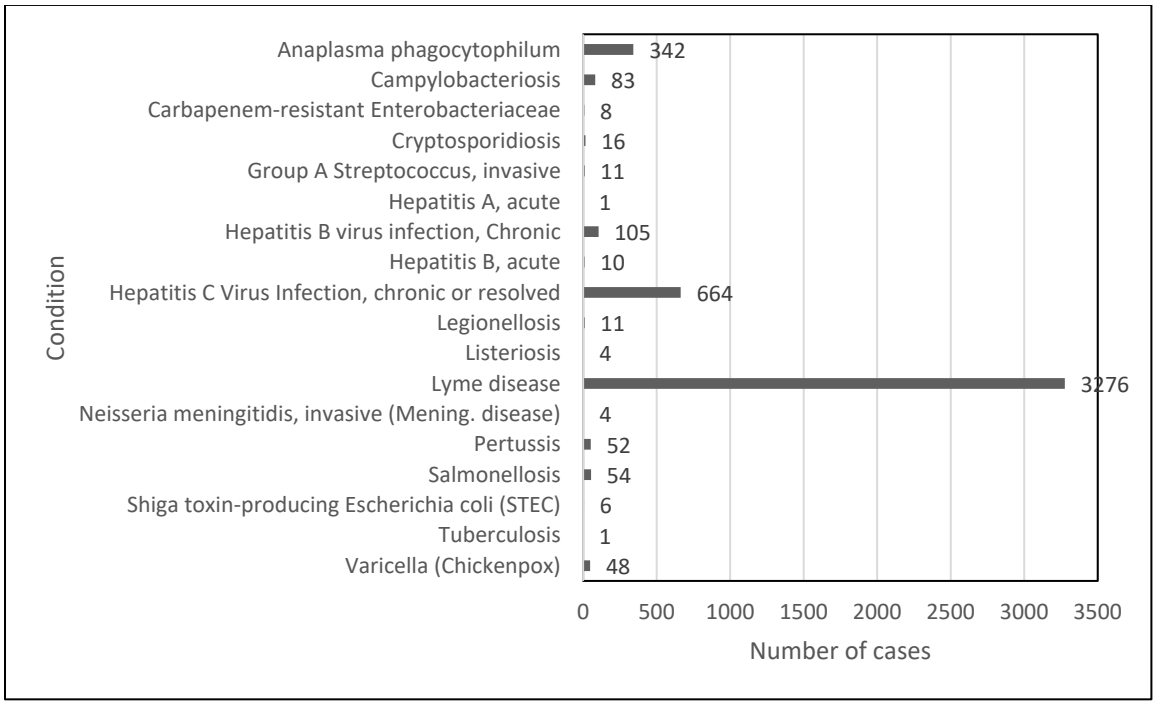
1. Descriptions

Infectious diseases are caused by bacterial infections, viruses, fungi and other organisms that can spread through the human population.

2. Past Occurrences

The most prevalent infectious disease in Bennington County has been Lyme disease, carried by and transmitted by ticks. The symptoms can range from minor to very severe, and are a clear threat to anyone in the town. Figure 4 shows those diseases tracked by the Vermont Department of Health.

Figure 4. Disease cases in Bennington County from 2006 to 2017. Source: Veronica Fialkowski, Vermont Department of Health



3. Extent and Location

In general, individuals and families are most affected by infectious diseases, but schools and businesses could be affected as well.

4. Probability, Impact and Vulnerability

Given past history, there is a low probability of a disease affecting a large portion of the town, but high probability of continued, isolated occurrences. Lyme disease, and other tickborne diseases could affect residents and those using recreational trails and visiting natural areas.

V. Vulnerability Assessment

A. Prioritization of Hazards

The information described above was used to prioritize hazards using criteria form the Vermont Hazard Mitigation Plan as described in Table 19 below.

Table 20. Vulnerability assessment factors (Vermont Hazard Mitigation Plan 2014)
Frequency of Occurrence: Probability
1 = Unlikely <1% probability of occurrence per year
2 = Occasionally 1–10% probability of occurrence per year, or at least one chance in next 100 years
3 = Likely >10% but <100% probability per year, at least 1 chance in next 10 years
4 = Highly Likely 100% probability in a year
Warning Time: Amount of time generally given to alert people to hazard
1 = More than 12 hours
2 = 6–12 hours
3 = 3–6 hours
4 = None–Minimal
Geographic Area Affected: How large an area would likely be affected?
1 = Community-wide
2 = State-wide
3 = Region-wide
Potential Impact: Severity and extent of damage and disruption
1 = Negligible Isolated occurrences of minor property damage, minor disruption of critical facilities and infrastructure, and potential for minor injuries
2 = Minor Isolated occurrences of moderate to severe property damage, brief disruption of critical facilities and infrastructure, and potential for injuries
3 = Moderate Severe property damage on a neighborhood scale, temporary shutdown of critical facilities, and/or injuries or fatalities
4 = Major Severe property damage on a metropolitan or regional scale, shutdown of critical facilities, and/or multiple injuries or fatalities

B. Priority Hazards

As can be seen in Section IV, the planning team undertook an exhaustive assessment of hazards that could affect Arlington. They then scored those hazards based on the criteria in Table 19 to determine for which hazards actions would be needed. Table 20 shows the results of the scoring, with Flood and Flash Floods, Winter Storms, High Wind Events, Drought, Hazardous Materials Spills, Infectious Diseases and Invasive Species ranked highest. Geographic area affected and potential impacts were key criteria in determining whether or not mitigation actions would be developed for specific hazards. The planning team determined that, while earthquakes ranked high, the score was likely due to the short warning time and, therefore, was not an accurate representation of the threat of this hazard.

Table 21. Vulnerability assessment

Hazard	Number of Events	Frequency of Occurrence	Warning Time	Geographic Area Affected	Potential Impacts	Total Score
Floods and Flash Floods	50 events from 1996 to 2017	3	2	3	3	11
Winter Storms	162 events from 1996 to 2017	4	1	3	3	11
High Wind Events	131 events from 1996 to 2017	3	3	1	3	10
Hail	30 events from 1996 to 2017	3	3	1	1	8
Temperature Extremes	Annual >90 F – 1 day on average Annual maximum <32 F – 55 days Annual minimum < 32 F – 172 days	1 >90 4< 32	1	2	1	5 (>90 F) 8 (<32 F)
Drought	Severe droughts have occurred in 27 years from 1895 to 2017	3	1	3	2	9
Wildfire	17 events from 1992 through 2017	1	4	1	1	7
Landslides and Debris Flows	No records	1	4	1	1	7

Table 21. Vulnerability assessment						
Hazard	Number of Events	Frequency of Occurrence	Warning Time	Geographic Area Affected	Potential Impacts	Total Score
Earthquake	No events causing damage	1	4	3	2	10
Hazardous Materials Spills	63 events from 1978 to 2018	3	4	1	2	10
Infectious Disease Outbreak	Annual	4	1	3	3	11
Invasive Species	Ongoing	4	1	3	2	10

Table 22. High hazards/vulnerable sites. Source: Local Emergency Operations Plan for the Town of Arlington; Planning Team	
Site Type (e.g., dam, culvert, bridges, railway crossing, low-lying area)	Site Location (physical location)
Roads Route 313 West Town Highway #24 River Road	Entire length from 313/7A intersection to New York line
TH #6 Old Mill Road	From East Arlington road to Sunderland Route 7 Crossing
Bridges---Route 313 West by Recreation Park Four (4) bridges on TH# 24 River Road	From 7A / 313 west to New York line
High Water Areas---Howell Camp Ground	No Name Road At end of School Street
Camping On The Battenkill	Route 7A north of Arlington
Warm Brook Downstream of Miller Pond	East Arlington Rd. / Ice Pond Rd / Warm Brook Rd & Old Depot road
Miller Duck Pond Under R/R	Old Depot Rd.
Route 7A	AOT identified high accident segments
“Death Valley”	Area along 7A is a high accident area
River Road	Guard rails should be expanded to provide further safety

Map 11 is shows damages documented during Tropical Storm Irene and roads identified by the planning team as areas of potential accidents, difficult areas for snow plowing,

and other issues. Clearly the transportation system has been vulnerable in the past and continues to require monitoring, maintenance and upgrades. Rockfalls and landslide potential (Map 9) also show vulnerabilities to the transportation system. Other priority hazards such as infectious diseases could not be mapped as those hazards would likely affect the entire town and beyond. A composite map of the hazards would be difficult to present, but Maps 6, 8, 9, 10, and 11 can be used together to identify hazard areas.

VI. Mitigation Measures

A. Hazard Mitigation Goals

As part of the planning process, the Town identified the following mitigation goals:

1. Reduce injury and loss of life resulting from natural disasters.
2. Reduce damage to public infrastructure, minimize disruption to the road network and maintain both normal and emergency access.
3. Establish and manage a program to proactively implement mitigation projects for roads, bridges, culverts and other municipal facilities to ensure that community infrastructure is not significantly damaged by natural hazard events.
4. Design and implement mitigation measures so as to minimize impacts to rivers, water bodies and other natural features, historic structures, and neighborhood character.
5. Increase the economic resiliency of Arlington by reducing the economic impacts incurred by municipal, residential, agricultural and commercial establishments due to disasters.
6. Incorporate hazard mitigation planning into other community planning projects, such as Town Plan, Capital Improvement Plan, and Town Local Emergency Operation Plan
7. Ensure that members of the general public continue to be part of the hazard mitigation planning process.

B. 2012 Arlington Hazard Mitigation Plan

Arlington completed a town hazard mitigation plan in 2011, which was approved by FEMA in 2012. Table 22 lists mitigation actions from that plan.

Table 23. Mitigation strategies from the 2012 Arlington Hazard Mitigation Plan.
Source: Arlington Hazard Mitigation Plan (2012). Note: Time frames below are as follows: Short term = 6 mo-1 yr. Medium term = 1-3 yrs. Long term = 4-5 yrs.

Mitigation Action In Priority Order	Responsible Parties	Approximate Time Frame & Potential Funding Sources	Initial Implementation Steps	Status
TH#6 Old Mill Rd Retaining Wall - $300,000 Strengthen retaining wall TH#1 E. Arlington Rd Bridge 3 - $400,000 Elevate deck TH#1 E. Arlington Rd Bridge 4 - $48,000 Elevate deck and extend abutments TH#8 Old West Rd Bridge 10 - $205,000 Increase flow capacity	Select Board & Road Foreman	• Short to Long Term • Local & State Resources • PDM-c Funds	Conduct "needs assessment"; Technical assistance from ANR, BCRC, VEM	General action in previous plan has led to studies that concluded these more specific projects
Flood-proof East Fire House in Flood Hazard Area	Select Board & Fire Dept.	• Med. to Long Term • Local & State Resources	Conduct assessment, explore options and costs to determine feasibility	Deferred due to lack of funding
Educate public on National Flood Insurance Program, Fluvial Erosion Hazard Zones, Fire & Flood Prevention	Select Board, EMD, Community	• Short to Long Term • Local & State Resources	Conduct "needs assessment"; determine what resources are needed; Assistance from state agencies	New and In Progress

The retaining wall was replaced in 2015. Others have been incorporated into this plan.

The town annually updates the Local Emergency Operations Plan (Local 'Emergency Management Plan starting in 2019). Since 2012, the town has been actively improving culverts and bridges as well as addressing stormwater management areas. The vulnerability assessment in this current hazard mitigation plan addresses the same impacts from the priority natural hazards as the 2012 plan. The actions to upgrade flood drainage structures and to work with landowners to flood proof structures are retained as actions in this current plan.

Arlington joined the National Flood Insurance Program (NFIP) in 1978. There are 12 flood insurance policies in effect. The Town Zoning Administrator reviews permits for development, including any proposed within special flood hazard areas or river corridors, to assure development is consistent with the town bylaws. The town does not restrict development within river corridors. There are no repetitive loss properties in Arlington. As noted in Section IV. A. most of the vulnerable structures are single family homes, with few commercial properties in either the special flood hazard area or river corridor.

C. 2015 Arlington Town Plan

The 2015 town plan (Town of Arlington 2015) includes goals for the prohibition of developments that would adversely affect special resource areas or unique natural features, protecting prime agricultural lands and ridges and mountaintops, continued protection of the Batten Kill, and protecting ground and surface water resources. As shown in Map 3, development should be concentrated in the core, within the valley and along Routes 7A and 313 with reduced density in areas beyond. Higher elevations and forested areas would be maintained for forestry, hunting and recreational uses. Protection of these forested areas should help reduce the amount and velocity of water in the upper reaches of streams leading to the Batten Kill thereby increasing flood resilience.

D. Arlington Zoning Bylaws

Arlington joined the National Flood Insurance Program in 1978. The community report for Arlington (available via https://floodready.vermont.gov/assessment/community_reports) indicates there are 66 buildings in the Special Flood Hazard Area and 12 flood insurance policies. Arlington adopted a revised zoning ordinance in 2013 which:

- permits development in the floodway or other special flood hazard areas under specific conditions and by permit
- limits use of the Forest and Recreation District to agriculture, silviculture, hunting camps, and forest and recreation uses to maintain forested lands

E. Stormwater Management

The Vermont Clean Water Act, Vermont Act 64/H.35 and the Lake Champlain Phase 1 total maximum daily load (TMDL)[2] require that municipalities reduce sedimentation runoff from their road systems over a twenty-year period following attainment of stormwater permits between 2018 to 2021 (Vermont Agency of Natural Resources, 2017b). Towns are required to develop road stormwater management plans in the following steps:

1. Identify sections of roads connected to surface waters through ditches, culverts, or other drainage structures;
2. Inventory connected portions of the road network to determine if these sections meet the standards being developed by the Vermont Agency of Natural Resources;
3. Develop a long-term plan to bring all connected sections up to statewide design standards.

[2] This is a regulatory term under the Clean Water Act identifying the maximum amount of a pollutant that a body of water can receive and still meet water quality standards.

The Bennington County Regional Commission hired Fitzgerald Environmental Associates to complete both a stormwater master plan and to inventory hydrologically connected roads for erosion problems. Work was completed in 2018 and the plans completed in 2019. The stormwater master plan identified forty projects of varying complexity to reduce erosion and protect stormwater infrastructure (Map 12). More detail on these projects can be found in the Fitzgerald Environmental Associates reports completed in 2018 and 2019 available from the town. More specific design information was developed for these for use in grant applications. In addition, partner organizations including the Bennington County Regional Commission and the Bennington County Conservation District are working with the town to find funding to remedy these problem areas.

The road erosion survey identified 40 road segments that currently do not meet applicable standards. These generally lacked drainage ditches, had eroded ditches or had unstable conveyances. Ten segments were categorized as "Very High" priority as they were on slopes of 10% or greater. The municipal general permit requires that these be brought up to standard by 2025. All segments should be brought up to standard by 2036 (Map 12).

F. State and Regional Plans and Programs

1. Vermont Hazard Mitigation Plan (2018)

The Vermont Hazard Mitigation Plan (2018) identified a series of hazards shown in Table 22 below along with those we considered in this plan. The planning team used the state plan as a starting point and local knowledge to create a more specific set of hazards that they addressed. Table 22 shows how the Arlington plan tracks the state plan.

Table 24. Comparison of hazards considered in the Vermont Hazard Mitigation Plan vs. the Arlington Hazard Mitigation Plan

VT Hazard Mitigation Plan	Arlington Hazard Mitigation Plan
Hazards	**Natural Hazards**
Drought	Drought
Earthquake	Earthquake
Inundation Flooding	Flooding and Fluvial Erosion
Fluvial Erosion	Flooding and Fluvial Erosion
Hail	Hail
Wind	High Winds
Hurricane/Tropical Storm	High Winds and Flooding and Fluvial Erosion
Infectious Disease	Infectious Disease Outbreak
Landslides	Landslide/Debris Flow
Severe Thunderstorm	See High Winds and See Flooding and Fluvial Erosion

Table 24. Comparison of hazards considered in the Vermont Hazard Mitigation Plan vs. the Arlington Hazard Mitigation Plan	
VT Hazard Mitigation Plan	Arlington Hazard Mitigation Plan
Snow and Ice Storm	Winter Storms
Extreme Heat	Temperature Extremes
Extreme Cold	Temperature Extremes
Wildfire	Wildfire

2. Bennington County Regional Plan Policies and Actions (adopted March 19, 2015)

The Bennington County Regional Plan (Bennington County Regional Commission 2015) lists the following policies and actions supporting hazard mitigation including several policy recommendations emphasizing protecting natural resources, maintaining village and urban centers and avoiding development on sensitive lands including areas of steep slope and wetlands along with the protection of surface and groundwater resources and forested lands (Sections VII and VIII). The regional plan also includes a flood resilience section (IX), which is required by Vermont statutes describing potential hazards from flooding and fluvial erosion. The section encourages avoiding development in flood hazard areas, reconstruction of bridges and culverts that impede flows, undisturbed buffer areas along streams to provide for lateral movement and attenuation of overland flow, participation in the National Flood Insurance Program, updating of flood bylaws, adoption of up to date road and bridge standards and participation in the community rating system.

3. Community Wildfire Protection Plan for the Towns of Arlington, Glastenbury, Sandgate, Shaftsbury and Sunderland

A community wildfire protection plan (Batcher and Henderson 2013) was completed by the Bennington County Regional Commission for the towns of Arlington, Glastenbury Sandgate, Shaftsbury and Shaftsbury in 2013. The plan was developed in cooperation with the Arlington and Shaftsbury Fire Departments, the Vermont Department of Forests, Parks and Recreation, the fire wardens from each town, Bennington County Mutual Aid and Green Mountain National Forest. Presentations were made to the planning commissions of each town to gather their input as well. The community wildfire plan includes actions for education and outreach, improvements to water resources for wildland and structure protection, and fuel reduction projects. That plan has been incorporated into this plan.

4. Vermont Agency of Natural Resources

The Vermont Agency of Natural Resources (VT ANR) has worked with Arlington and other communities to adopt updated flood and river corridor regulations. VT ANR also has mapped river corridors and can regulate activities within those that are not subject to review by

municipalities. VT ANR also reviews municipal permit applications for development within the special flood hazard area, permit applications for stream alterations, regulated activities within wetlands, and permits for transporting hazardous materials.

5. Act 250 Review

The Act 250 program provides a public, quasi-judicial process for reviewing and managing the environmental, social and fiscal consequences of major subdivisions and developments in Vermont. During Act 250 proceedings, agencies and the public can offer comments on such proposed developments.

6. Other Organizations

Phase I and II geomorphic assessments and a river corridor plan (Field 2007) have been completed for the Batten Kill listing restoration actions. These were integrated into the Batten Kill Walloomsac Hoosic Tactical Basin Plan (Vermont Agency of Natural Resources 2016). The Bennington County Regional Commission, Bennington County Conservation District, The Batten Kill Watershed Alliance and Vermont Agency of Natural Resources have been working to implement the actions in the river corridor plan.

G. Town Capabilities

Table 24 below summarizes town capabilities and areas needing improvement to enhance those capabilities.

The river valleys and lowlands in Arlington have a relatively high potential for supplying groundwater. New development may occur in these areas, and will rely on these groundwater resources. Strict enforcement of local and State health ordinances, protection of wetlands, and prevention of hazardous waste contamination in these areas will be necessary to ensure a continued supply of clean groundwater for the Town well into the future.

Table 25. Capabilities of the Town of Arlington			
Plans, Policies, Ordinances	Description/Responsible Agent	Effectiveness	Improvements Needed
Town Plan	Planning Commission; Select Board (adoption of Town Plan)	Effective	In the next update, integrate this plan into the town plan
LEOP	Emergency Manager Director; Select Board (adoption of plan)	Annual updates important	Update and improve LEOP and replace with Local Emergency Management Plan as part of the annual process.
Flood hazard bylaws	Planning Commission; Zoning Administrator (permitting); Select Board (approval of bylaws)	Recently adopted new flood hazard regulations (2013)	Continue to monitor FEMA regulations and new local flood hazards. Need to adopt river corridor protection.
Mutual Aid for Emergency Services	Emergency Management Director; Select Board (approval of agreements); LEPC (coordination)	Needs some improvements and updates	Update mutual aid fire agreements with neighboring communities.
Mutual Aid for Public Works	Emergency Management Director; Road Foreman; Water Department; Select Board (approval of agreements); LEPC (coordination)	Needs some improvements and updates	Develop mutual aid agreements for road maintenance.
Zoning/Subdivision Regulations	Planning Commission and Zoning Administrator (permitting); Select Board (approval of bylaws)	Effective	Continued training of volunteer board members to ensure effective permitting and Zoning Administrator.
Wetlands/Rivers and Streams/Waterbodies/Steep Slopes/Groundwater Protection Regulations	Planning Commission; Zoning Administrator (permitting); Select Board (approval of bylaws)	Effective	Continued training of volunteer board members to ensure effective permitting and Zoning Administrator.
Building Codes	State of Vermont (commercial only); Zoning Administrator (certain building codes in flood hazard zones)	Commercial building codes overseen by State of Vermont (Department of Public Safety)	Town does not oversee building codes for residential structures.
Water	Water Department; Select Board	Effective	Make upgrades to system as needed.

Table 25. Capabilities of the Town of Arlington			
Plans, Policies, Ordinances	Description/Responsible Agent	Effectiveness	Improvements Needed
Road Maintenance Programs and Standards	Road Foreman; Select Board	Effective; Town adopted most recent State of Vermont (AOT) road and bridge standards	
Events Management	Select Board Vendor permit	Effective	
School Emergency Response	School administrators; Emergency Management Director	Varies from school to school; needs some improvements	Update and review school emergency plans; LEPC should conduct onsite training.
Vulnerable Populations	Emergency Management Director and Health Officer	Needs some improvements and updates	
Mobile Homes	Emergency Management Director and; Health Officer	State of Vermont regulates mobile homes and mobile home parks	Outreach to owners of mobile home parks and mobile home residents.

H. Mitigation Actions

Table 25 below lists mitigation actions for each of those hazards. Some will be implemented by the Town of Arlington and others by agencies such as the Vermont Agency of Transportation. Mitigation actions are listed by the type of hazard. Table 25 lists the criteria used in establishing project priorities, with ranking based on the best available information and best judgment as these proposed projects would need further study and design work. Prior to the implementation of any action, a benefit-cost analysis would be completed to assure the action would be feasible and cost-effective.

Table 26. Ranking of mitigation actions

Criteria	Ranking (score in parentheses)
Potential vulnerability from hazard	High (3): risk assessment score Medium (2): risk assessment score Low (1): risk assessment score
Potential protection of life and degree of reduction in damage by action	High (3): greater than 50% reduction in estimated damage, loss of life or injury Medium (2): 25-50% reduction in estimated damage, loss of life, or injury Low (1): less than 25% reduction in estimated damage, loss of life or injury
Consistency of the action with town goals and plans	High (3): goals are consistent with existing town plans Low (1): goals are inconsistent with existing town plans
Degree of technical feasibility of the proposed action	High (3): project is technically feasible Low (1): feasibility is low
Implementation costs	High (3): project could be implemented for less than $25,000 Medium (2): project would cost between $25,000 and $100,000 Low (1): project costs would exceed $100,000
Ability of the town to implement the proposed action in terms of administrative capability and legal authority	High (3): town has current capability to implement the action Medium (2): town would need to expand capability while implementing action through contractors or additional staffing Low (1): town would need extensive assistance to implement action
Degree of local support for the action	High (3): the community supports the proposed action Low (1): the project is opposed in the community
Potential costs to natural systems of implementing the action	High (3): natural systems would not be affected, would be enhanced by the action or be affected to a minimal degree Medium (2): natural systems would be affected by impacts could be mitigated or reduced Low (1): natural systems would be negatively impacted and those impacts could not be mitigated or reduced

Table 26. Ranking of mitigation actions	
Criteria	Ranking (score in parentheses)
Potential costs to cultural resources of implementing the action	High (3): cultural resources would not be affected Medium (2): cultural resources would be affected by impacts could be mitigated or reduced Low (1): cultural resources systems would be negatively impacted and those impacts could not be mitigated or reduced
Potential costs to social and economic resources of implementing the action	High (3): social and economic resources would either be unaffected or enhanced by the project Medium (2): economic and social resources would be affected by impacts could be mitigated or reduced Low (1): economic and social resources would be negatively impacted and those impacts could not be mitigated or reduced

Table 27. Mitigation Actions. Type is based on categories in FEMA 2013						
Hazard	Type	Action	Responsible Party	Time Frame	Funding Source(s)	Priority
All Hazards	Education and Outreach	Provide a "be prepared" section of the Town website with links to information for residents	Select Board	2020 to 2021	Town general fund	High
All Hazards	Local Planning and Regulations	Encourage proper construction techniques and use of appropriate materials to address hazards, particularly flooding, winter storms, wind events, earthquakes, landslides and wildfire	Town Planning Commission; Zoning Administrator	2020 to 2021	Town general fund	Medium
All Hazards	Local Planning and Regulations	Build economic development capacity as recommended in the Southern Vermont Comprehensive Economic Development Strategy (in progress)	Select Board	2020 to 2022	Town general fund	Medium
All Hazards	Local Planning and Regulations	Integrate this hazard mitigation plan into the Town Plan, the Local Emergency Management Plan and budgeting and capital improvements plan	Town Select Board Town Planning Commission Zoning Administrator Select Board	2020 to 2025 (ongoing)	Town general fund	High
All Hazards	Education and Awareness	Identify and develop methods to communicate with populations vulnerable to potential hazards, particularly drought, extreme temperatures and infectious diseases, but also those in need of assistance for evacuation and/or sheltering	Town Emergency Management Director	2020 to 2021	Town general fund	Medium to High
All Hazards	Education and Awareness	Encourage businesses and institutions to develop continuity of operations plans	Select Board	2020 to 2022	Town general fund	Medium
All Hazards	Local Planning and Regulations	Assess need for driveway standards to assure adequate emergency access particularly to assure adequate access in winter storms, floods and for wildfire protection	Town Planning Commission	2020 to 2021	Town general fund	Medium
Floods and Flash Floods	Education and Awareness	Educate owners on importance of securing propane tanks and other items that could float or blow away in storms	Town Zoning Administrator	2020 to 2021	Town general fund	Medium

Table 27. Mitigation Actions. Type is based on categories in FEMA 2013						
Hazard	Type	Action	Responsible Party	Time Frame	Funding Source(s)	Priority
Floods and Flash Floods	Local Planning and Regulation	Develop a watershed planning team with other towns within the Batten Kill watershed to coordinate planning and other actions to protect the river and promote flood resilience	Town Planning Commission BCRC	2021 to 2023	Town general fund Watershed Grant from VT ANR	High
Floods and Flash Floods	Local Planning and Regulations	Adopt and enforce updated flood hazard and river corridor protection zone bylaws	Planning Commission; Zoning Administrator	2020 to 2021	Town general fund	High
Floods and Flash Floods	Local Planning and Regulations	Participate in the Community Rating System to help reduce flood insurance premiums for residents and businesses	Town Select Board	2020 to 2022	Town general fund	High
Floods and Flash Floods	Local Planning and Regulations	Encourage appropriate stormwater and erosion control measures in new developments	Planning Commission; Road Foreman	2020 to 2025 (ongoing)	Town general fund	High
Floods and flash floods	Local Planning and Regulations	Adopt the latest Vermont Town Road and Bridge Standards	Town Select Board	2020 to 2025 and as updated	Town general fund	High
Floods and Flash Floods	Local Planning and Regulations	Inventory roads for stormwater mapping as part of the Vermont Stormwater program	Road Foreman BCRC	2020 to 2022	VT Better Roads Town General Fund	High
Floods and Flash Floods	Local Planning and Regulations	Update culvert inventory	Road Foreman BCRC	2020 to 2021	Town General Fund VT Better Roads funding	High
Floods and flash floods	Natural Systems Protection	Acquire or work with conservation organizations to acquire flood prone areas and wetlands to protect flood storage areas and limit inappropriate development	Select Board	2020 to 2025	Town General Fund, private funds, FEMA HMBP, FMA, PDM-C	Low

Table 27. Mitigation Actions. Type is based on categories in FEMA 2013						
Hazard	Type	Action	Responsible Party	Time Frame	Funding Source(s)	Priority
Floods and flash floods	Structure and Infrastructure projects	Work with willing property owners to flood proof structures and to acquire properties subject to flooding or fluvial erosion	Select Board	2020 to 2025	Town General Fund, FEMA HMGP, PDM-C, FMA	Low
Floods and flash floods	Structure and Infrastructure projects	Road crew should regularly survey culverts for blockages including photographs and records of damages and costs	Road Foreman	2020 to 2025 (ongoing)	Town highway fund	High
Floods and flash floods	Structure and infrastructure protection	Encourage property owners in flood or fluvial erosion hazard zones to consider selling their properties (buy out) or implementing flood proofing including elevating structures	Town Select Board	2018 to 2022 (ongoing)	FEMA HMGP, PDM, FMA	Low
Floods and flash floods	Structure and infrastructure protection	Implement corridor protection, buffer plantings, structure and berm removal and other projects listed in the Batten Kill-Walloomsac-Hoosic Tactical Basin Plan and, where applicable, in the 2007 Batten Kill corridor plan (Field 2007) and in the	Town Select Board; Batten Kill Watershed Alliance Basin Planning Team	2020 to 2025 (ongoing)	FEMA HMGP, FMA, PDM Vermont Ecosystem Restoration Program, Vermont Watershed Grant	Low to Medium
Floods and flash floods	Structure and infrastructure projects	Identify and replace culverts and bridges that do not meet current Vermont Town Road and Bridge Standards	Road Foreman	2020 to 2025 (ongoing)	Town highway fund State of Vermont AOT FEMA HMGP, PDM, FMA	High
Floods and flash floods	Structure and infrastructure projects	Relocate East Arlington Fire Station to a site outside of both the special flood hazard area and river corridor	Select Board Fire Department	2022 to 2025	Town, FME HMGP, PDM, FMA	Medium
Floods and flash floods	Structure and infrastructure projects	Bring all road segments prioritized in the road erosion inventory as “Very High” priority up to standards by 2025	Select Board Road Foreman	2022 to 2025	Town highway fund; Vermont AOT	High

Table 27. Mitigation Actions. Type is based on categories in FEMA 2013						
Hazard	Type	Action	Responsible Party	Time Frame	Funding Source(s)	Priority
Floods and flash floods	Structure and infrastructure projects	Complete projects identified as high priority in the town stormwater master plan	Select Board Road Foreman	2022 to 2025	Town highway fund, Vermont AOT	High
Winter storms	Education and Outreach	Provide educational materials on sheltering in place and preparation for winter storms, including long-term power outages	Town Emergency Management Director	2020 to 2021	Town general fund	High
Winter storms	Education and Awareness	Provide materials for residents on methods to protect property from wind events	Town Emergency Management Director; Zoning Administrator	2020 to 2022	Town general fund FEMA HMGP, PDM, FMA	High
Winter storms	Local Planning and Regulations	Develop agreements with adjacent towns for sharing of highway equipment	Town Select Board; Road Foreman	2020 to 2021	Town general fund	High
Winter storms	Structure and Infrastructure Projects	Place utilities underground for critical facilities such as town hall or the public safety building.	Select Board	2020 to 2022	FEMA HMGP, PDM, FMA	Low to Medium
High wind events	Education and Outreach	Provide educational materials on sheltering in place and preparation for winter storms, including long-term power outages	Town Emergency Management Director	2020 to 2021	Town general fund	High
High wind events	Local Planning and Regulation	Require boats, propane tanks and other items stored outdoors to be secured	Town Planning Commission; Zoning Administrator	2020 to 2019	Town general fund	Medium
High wind events	Local Planning and Regulation	Encourage appropriate plantings to avoid future damage from downed trees		2020 to 2022	Town general fund	Medium

Table 27. Mitigation Actions. Type is based on categories in FEMA 2013						
Hazard	Type	Action	Responsible Party	Time Frame	Funding Source(s)	Priority
High wind events	Local Planning and Regulation	Encourage protection and planting of wind breaks in new developments	Town Emergency Management Director; Zoning Administrator	2020 to 2022	Town general fund	Low to Medium
High wind events	Structure and Infrastructure Projects	Retrofit existing buildings to withstand high winds including protection of power lines and other utilities	Town Select Board Private Owners	2020 to 2025 (ongoing)	FEMA HMGP, PDM	Medium
High wind events	Structure and Infrastructure Projects	Place utilities underground for critical facilities such as town hall or the public safety building.	Select Board Private Owners	2020 to 2022	FEMA HMGP, PDM	Low
Hail	Structure and Infrastructure Projects	Retrofit existing buildings to minimize hail damage	Town Select Board; Private Owners	2020 to 2022	FEMA HMGP, PDM	Low
Drought	Local Planning and Regulation	Monitor drought conditions	Town Emergency Management Director	2020 to 2025 (ongoing)	Town general fund	Medium to High
Drought	Education and Awareness	Provide educational materials on dealing with drought	Town Emergency Management Director	2020 to 2022	Town general fund FEMA HMGP, PDM	Medium to High
Drought	Natural System Protection	Develop improved assessment of groundwater sources and amend bylaws to assure their protection	Vermont Geological Survey Town Planning Commission	2020 to 2022	FEMA HMGP, PDM State of VT	High
Drought	Local Planning and Regulation	Incorporate planning for droughts in the local emergency management plan	Town Emergency Management Director	2020 to 2021	Town general fund	Medium
Hazardous materials spill	Local Planning and Regulation	Update 2012 assessment of hazardous materials and potential accident locations.	LEPC 7	2020 to 2021	State of VT DEC funds	High

Table 27. Mitigation Actions. Type is based on categories in FEMA 2013						
Hazard	Type	Action	Responsible Party	Time Frame	Funding Source(s)	Priority
Hazardous materials spill	Structure and Infrastructure Projects	Work with VT AOT to identify and mitigate high accident intersections and road segments	VT AOT	2016 to 2019	State AOT funds	High
Hazardous materials spill	Natural Systems Protection	Identify groundwater source areas and develop ordinances to protect those areas	Vermont Geological Survey	2020 to 2022	VT Geological Survey funds	Medium
Infectious disease outbreak	Local Planning and Regulations	Monitor disease occurrences and potential outbreaks, partnering with the VT Dept. of Health	Town Health Officer	2020 to 2022 (ongoing)	State of VT Dept. of Health	Medium
Infectious disease outbreak	Education and Outreach	Provide educational materials in printed form and on the town web site on potential infectious diseases	Emergency Management Director	2020 to 2022	Town general fund /State of Vermont Health Department	High
Invasive species	Local Planning and Regulations	Monitor extent of invasive species, particularly forest invasive species such as Emerald Ash Borer	Select Board	2020 to 2022 (ongoing)	Town general fund	Medium
Invasive species	Local Planning and Regulations	Complete surveys for ash trees vulnerable to Emerald Ash Borer in town highway ROW and a management plan to address dead and dying trees.	BCRC; Bennington County Conservation District	2020 to 2022	FEMA HMGP, PDM VT Department of Forests, Parks and Recreation	Medium
Invasive species	Local Planning and Regulations	Survey for invasive species (e.g., Japanese knotweed) along streams and roads	Batten Kill Watershed Alliance; Bennington County Conservation District	2020 to 2022	State of Vermont Department of Parks, Forestry and Recreation	Medium
Invasive species	Local Planning and Regulations	Encourage use of native species in plantings for commercial and residential development	Development Review Board	2020 to 2025 (ongoing)	Town general fund	Medium

Table 27. Mitigation Actions. Type is based on categories in FEMA 2013						
Hazard	Type	Action	Responsible Party	Time Frame	Funding Source(s)	Priority
Invasive species	Education and Awareness	Provide outreach materials for landowners on using native plants and controlling invasive species	Bennington County Conservation District	2020 to 2021	Town general fund /State of Vermont Department of Parks, Forestry and Recreation	High

VII. Plan Maintenance

A. Annual Monitoring and Continued Public Involvement

Copies of this plan will be kept at the town office and made available via the town and BCRC website. The Select Board intends to involve the public in the implementation, review and update of this plan. Tracking of actions will take place during the annual budgeting process, when funds are allocated for various programs to operate the town, including capital improvements. The Select Board is responsible for developing a town budget, which is approved during Town Meeting Day in March.

During future updates to the Town Plan, the planning commission will review this plan and incorporate relevant mitigation actions and goals into the Town Plan. This plan will also be integrated into annual updates to the Town Local Emergency Operations Plan. New data from a variety of studies completed by the Bennington County Regional Commission, the State of Vermont, the U.S. Forest Service and others will be used in updating the town plan, as they were used to develop this hazard mitigation plan. The process of updating the town plan will incorporate the public involvement, agency review and adjacent town review requirements of Vermont statutes.

B. Plan Evaluation and Update

The Arlington Select Board will be responsible for serving as or appointing a planning team for evaluating and updating the plan.

1. Plan Evaluation

The effectiveness of the plan will be determined by whether or not actions listed in Table 26 are implemented.

a) Prior to town meeting in March, the Select Board and the Emergency Management Director, will review each of the actions in Table 26 to determine their status. Status categories will include completed, in progress, scheduled, no progress.
b) The evaluation will be presented at a public meeting to allow for a discussion on progress in implementing the plan and the need for applying for funding or to address program and budgeting priorities.
c) The evaluation will be used to update the Local Emergency Operations Plan, which is required annually, and to identify potential changes to other town plans, programs and policies.

If requested, the Bennington County Regional Commission will provide advice and assistance on the plan evaluation.

2. Plan Update

At least one year before the five-year period covered by this plan, the planning team will initiate a review of the plan by:

a. Updating the descriptions and analyses of events using new information since completion of this 2017 hazard mitigation plan.
b. Identification of any new buildings or infrastructure or changes in critical facilities.
c. Estimation of potential probability and extent of hazards based on any new information since completion of this plan.
d. Review of completed hazard mitigation projects.
e. Identification of new projects given the revised hazard evaluation.
f. Review of any changes in priorities since adoption of this plan.
g. Revision of the assessment of risks and vulnerability from identified hazards.
h. Development and use of criteria to assess the potential benefits and costs of identified actions for use in prioritizing those actions.
i. Integration of the updated plan into the any updates to the Arlington Town Plan and other plans and programs.

The planning team will hold open meetings to solicit opinions and to identify issues and concerns from members of the public and stakeholders. The planning team and the Town of Arlington Select Board will work with the Bennington County Regional Commission and the State Hazard Mitigation Officer (SHMO) to review and update programs, initiatives and projects based on changing local needs and priorities. BCRC will assist in any necessary coordination and communication with neighboring towns to assure that mitigation actions address regional issues of concern. The revised plan will be submitted for review by the State Hazard Mitigation Officer and FEMA and revised based on their comments. Following approval by FEMA, the Select Board will adopt the completed plan.

C. Post Disaster Review and Revision

Should a declared disaster occur, Arlington may undertake special review of this plan and the appropriate updates made. After Action Reports, reviews, and debriefings should be integrated into the update process. The plan should also be updated to reflect completion of projects listed in the basin plan, river corridor plan, culvert surveys and other studies.

VIII. References

A. Literature and Reports

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B. Map Data Sources

The Vermont Open Geodata Portal (http://geodata.vermont.gov/)provides data on transportation systems, the location of structures (E911), critical facilities, jurisdictional boundaries, and other information. The base map was from ArcGIS Online (ESRI). Data from other sources specific maps is noted below.

Map 1. Town of Arlington: New York GIS Clearinghouse, https://gis.ny.gov/

Map 2. Town of Arlington Land Cover: National Oceanographic and Atmospheric Administration, https://coast.noaa.gov/digitalcoast/data/nlcd.html

Map 3. Arlington Economic Resources: Data from the Bennington County Regional Commission Town of Arlington Town Plan 2015

Map 4. Arlington Critical Facilities: Arlington Local Emergency Operations Plan (LEOP) (2016)

Map 5. Arlington Vulnerable Populations: Arlington Local Emergency Operations Plan (LEOP) (2016)

Map 6. Town of Arlington Special Flood Hazard Areas and River Corridors:
Vermont Agency of Natural Resources Natural Resources Atlas,
http://anrmaps.vermont.gov/websites/anra/
FEMA Flood Map Service Center: https://msc.fema.gov/portal/

Map 7. Town of Arlington Water Resources:
Vermont Agency of Natural Resources Natural Resources Atlas,

Map 8. Arlington Wildfire Potential: LANDFIRE Program, www.landfire.gov
Vermont Forest Resources Plan, http://anrmaps.vermont.gov/websites/sars_data/; BCRC data.

Map 9. Arlington Landslide Potential: Dale, J. 2015. Landslide potential in Bennington County, Vermont. Report prepared for Majorie Gale, Vermont Geological Survey from Green Mountain College, Poultney, VT.

Map 10. Arlington Invasive Species: Survey information from Fitzgerald Environmental Associates 2018, Mary Beth Deller, Michael Batcher

Map 11. Arlington Transportation Hazards Areas. Meetings with Arlington Select Board and town officials.

Map 12. Town of Arlington Stormwater Priorities. Fitzgerald Environmental Associates, 2018 and 2019.

C. Personal Communication Sources

Chelsea Dubie, M.Ed., Infectious Disease Epidemiologist, Vermont Department of Health, Chelsea.dubie@vermont.gov

Richard Heims, NOAA regarding drought indices, richard.heim@noaa.gov

Stuart Hinson, NOAA regarding NCDC data, stuart.hinson@noaa.gov

George Springston, Norwich University, Northfield, VT gsprings@norwich.edu

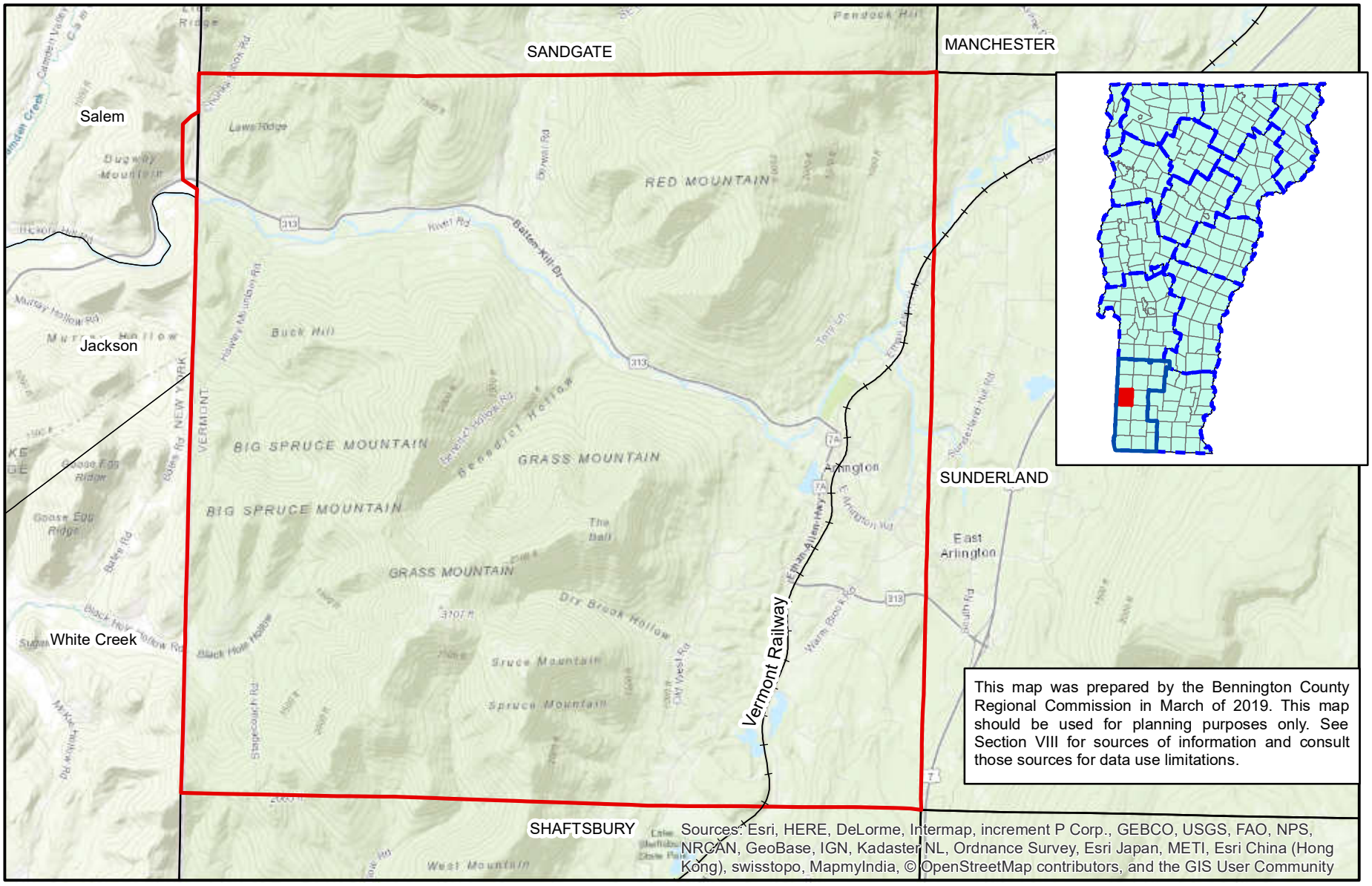
MaryBeth Deller, U.S. Forest Service, Botanist and Non-native Invasive Plant Program Coordinator, Green Mountain National Forest, Rochester, VT 05767, mdeller@fs.fed.us

Rick Ladue, Equinox Preservation Trust Steward, rick@equinoxpreservationtrust.org

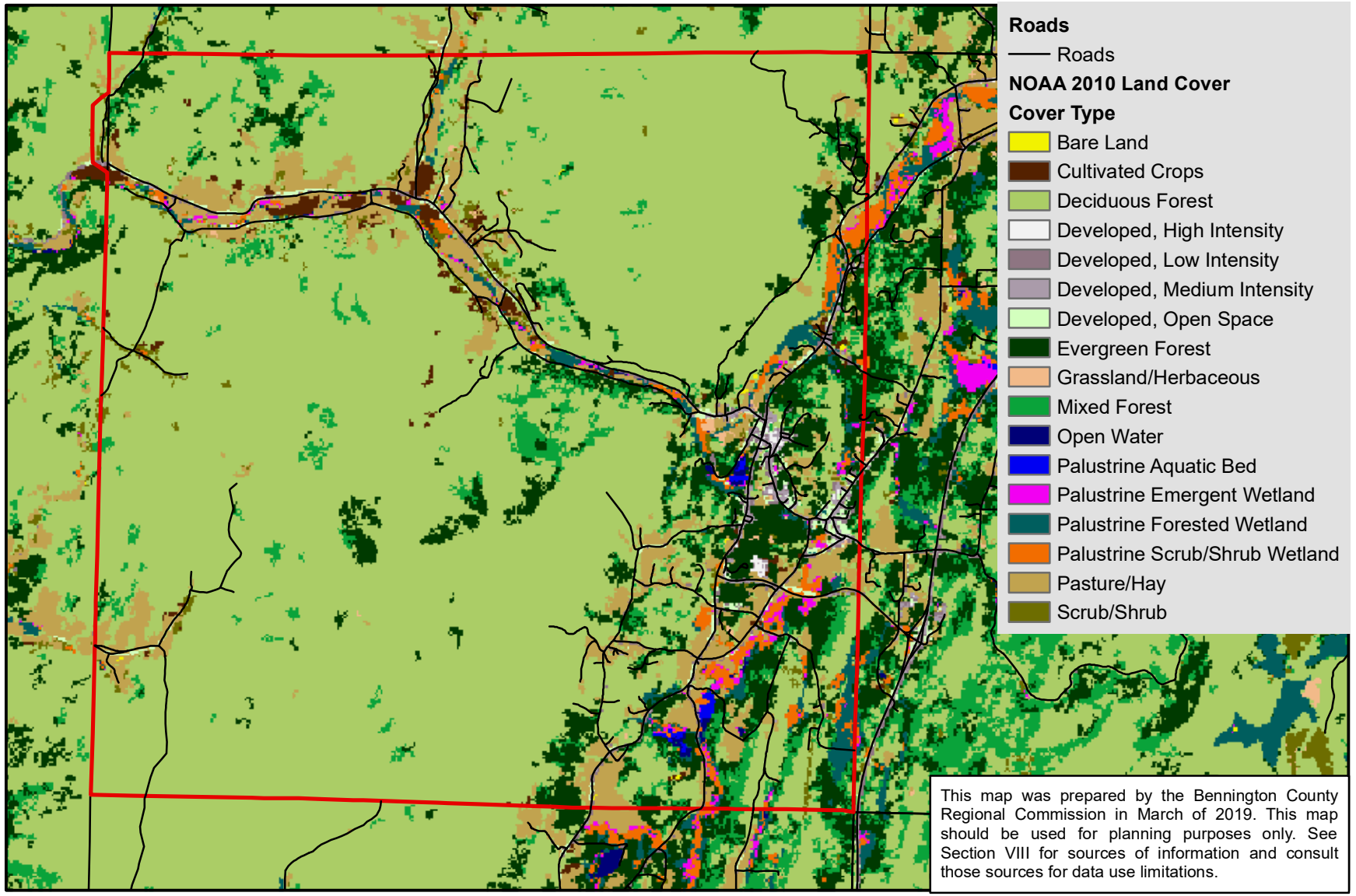
Michael S. Batcher, Bennington County Regional Commission, 111 South St., Suite 203, Bennington, VT 05201, mbatcher@bcrcvt.org

Appendix I. Comments Received

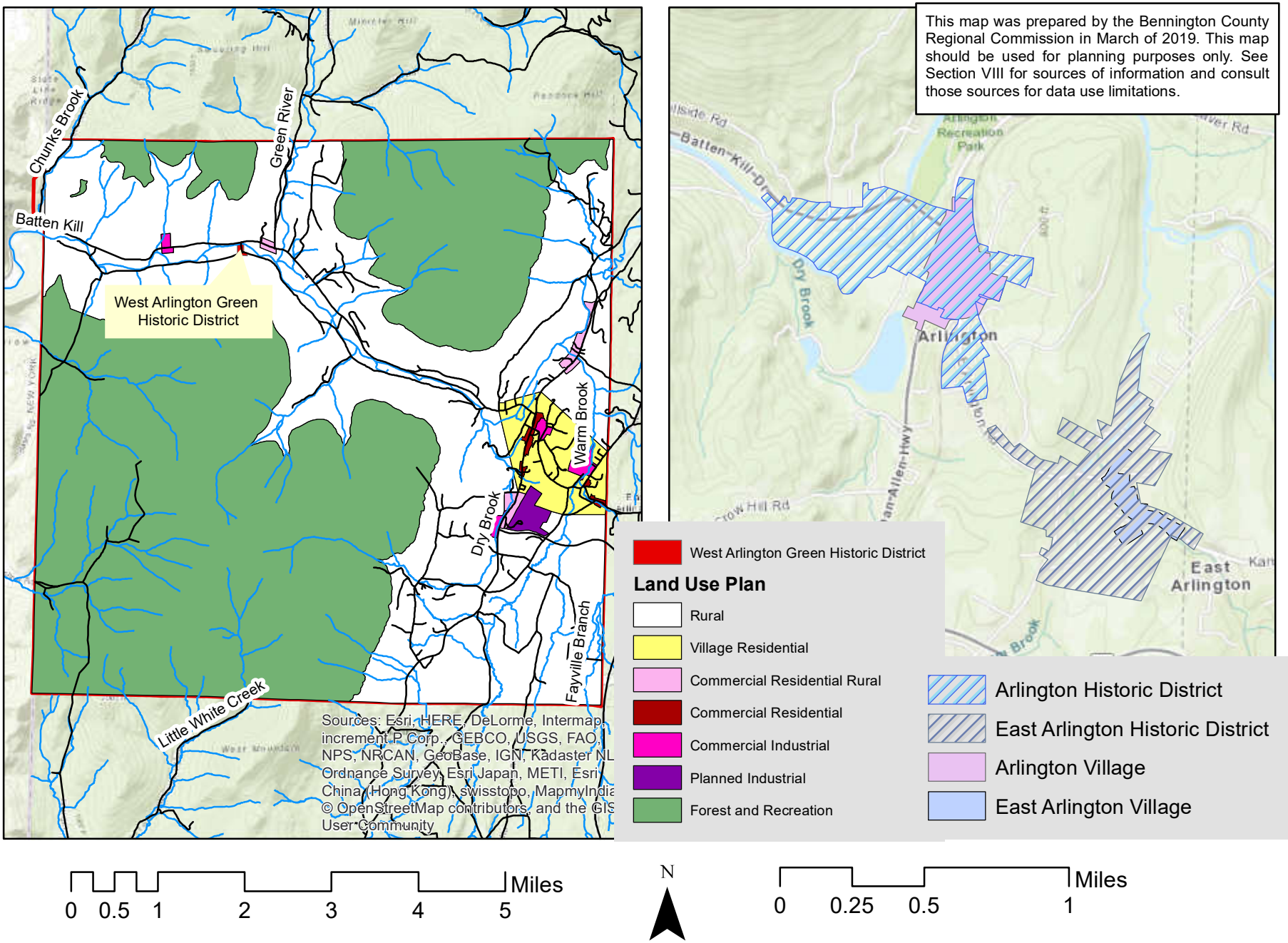
Map 1. Town of Arlington



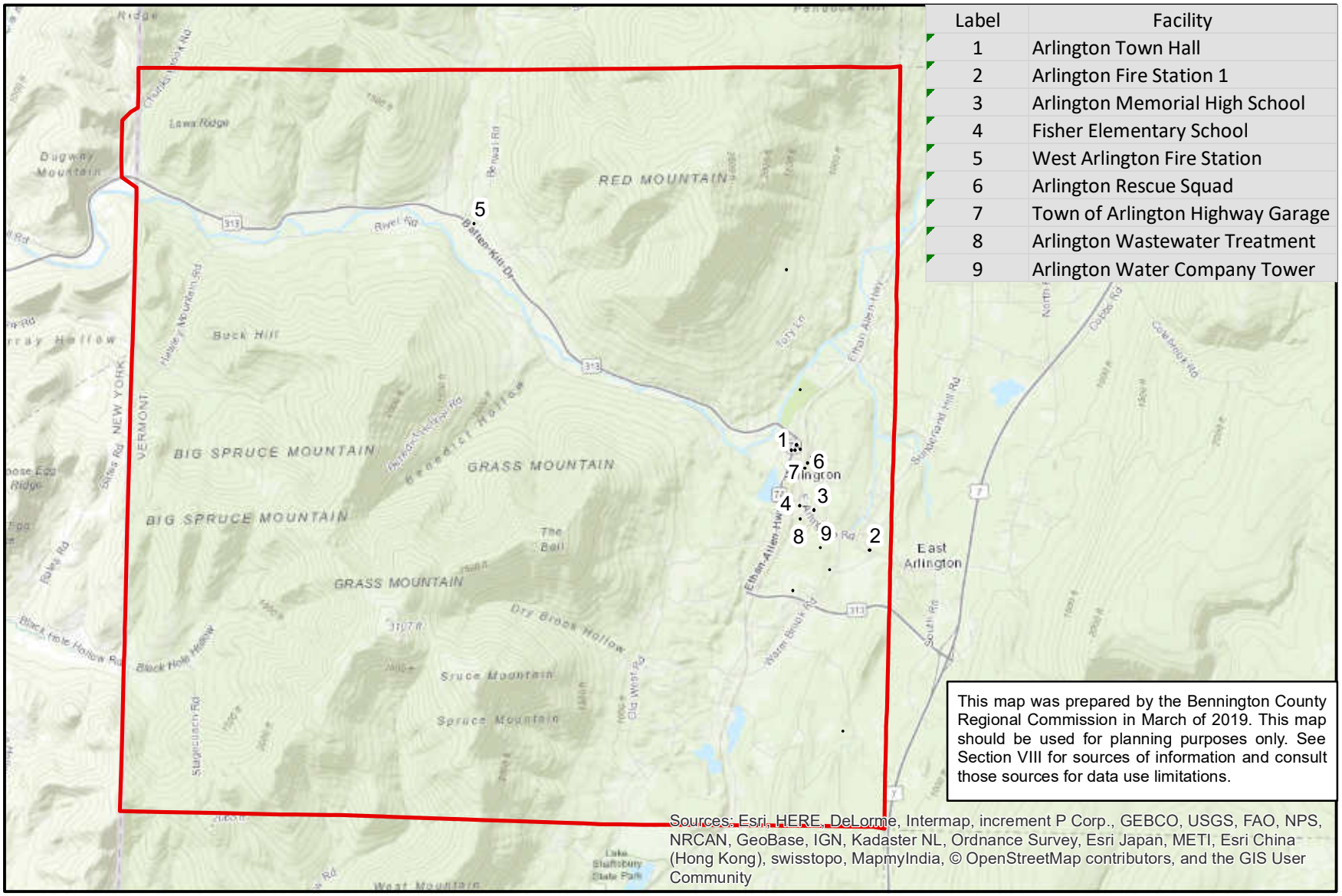
Map 2 Town of Arlington Land Cover



Map 3. Arlington Economic Resources



Map 4. Arlington Critical Facilities



Label	Facility
1	Arlington Town Hall
2	Arlington Fire Station 1
3	Arlington Memorial High School
4	Fisher Elementary School
5	West Arlington Fire Station
6	Arlington Rescue Squad
7	Town of Arlington Highway Garage
8	Arlington Wastewater Treatment
9	Arlington Water Company Tower

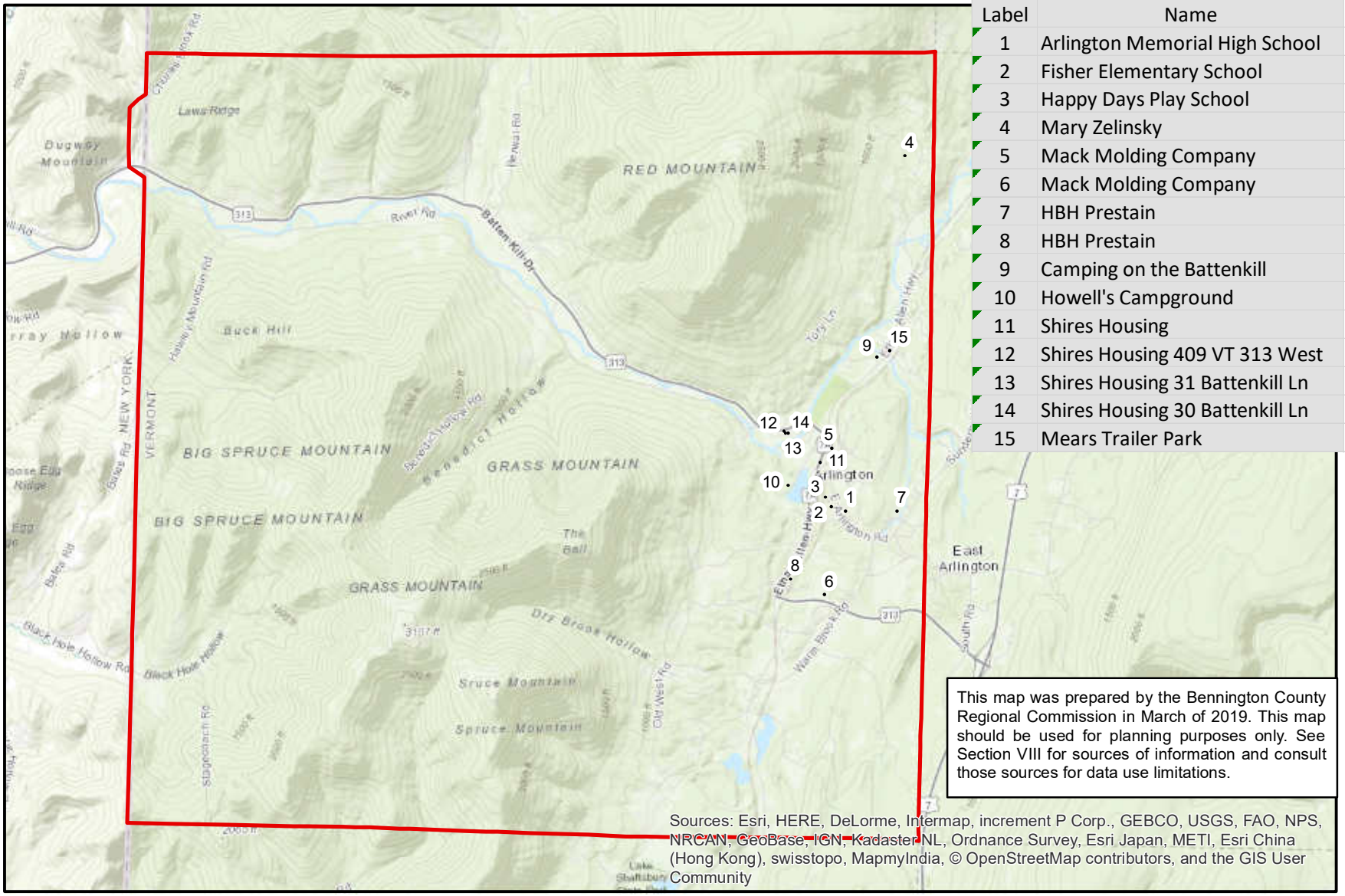
This map was prepared by the Bennington County Regional Commission in March of 2019. This map should be used for planning purposes only. See Section VIII for sources of information and consult those sources for data use limitations.

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

N

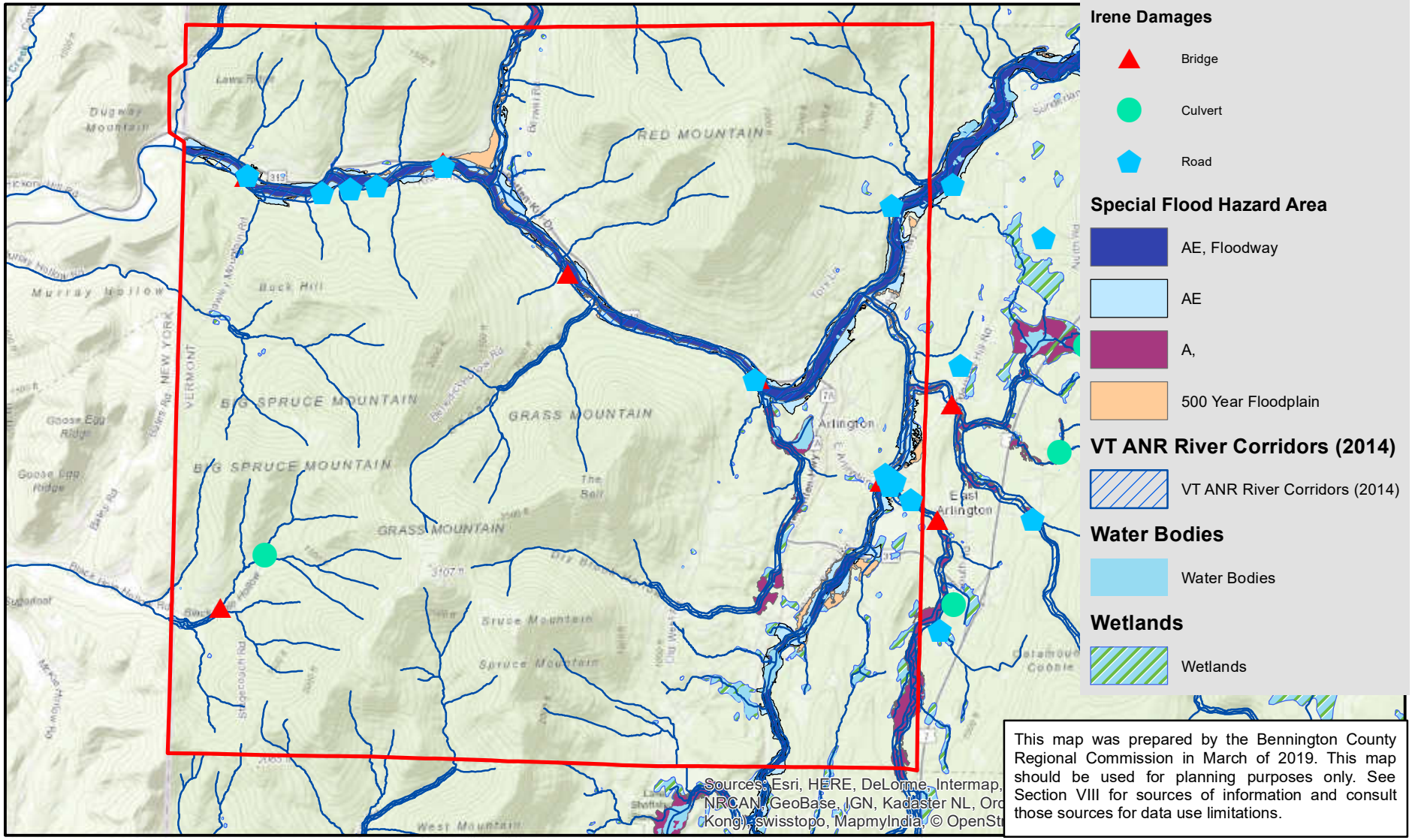
0 0.5 1 2 3 4 5 Miles

Map 5. Arlington Vulnerable Populations

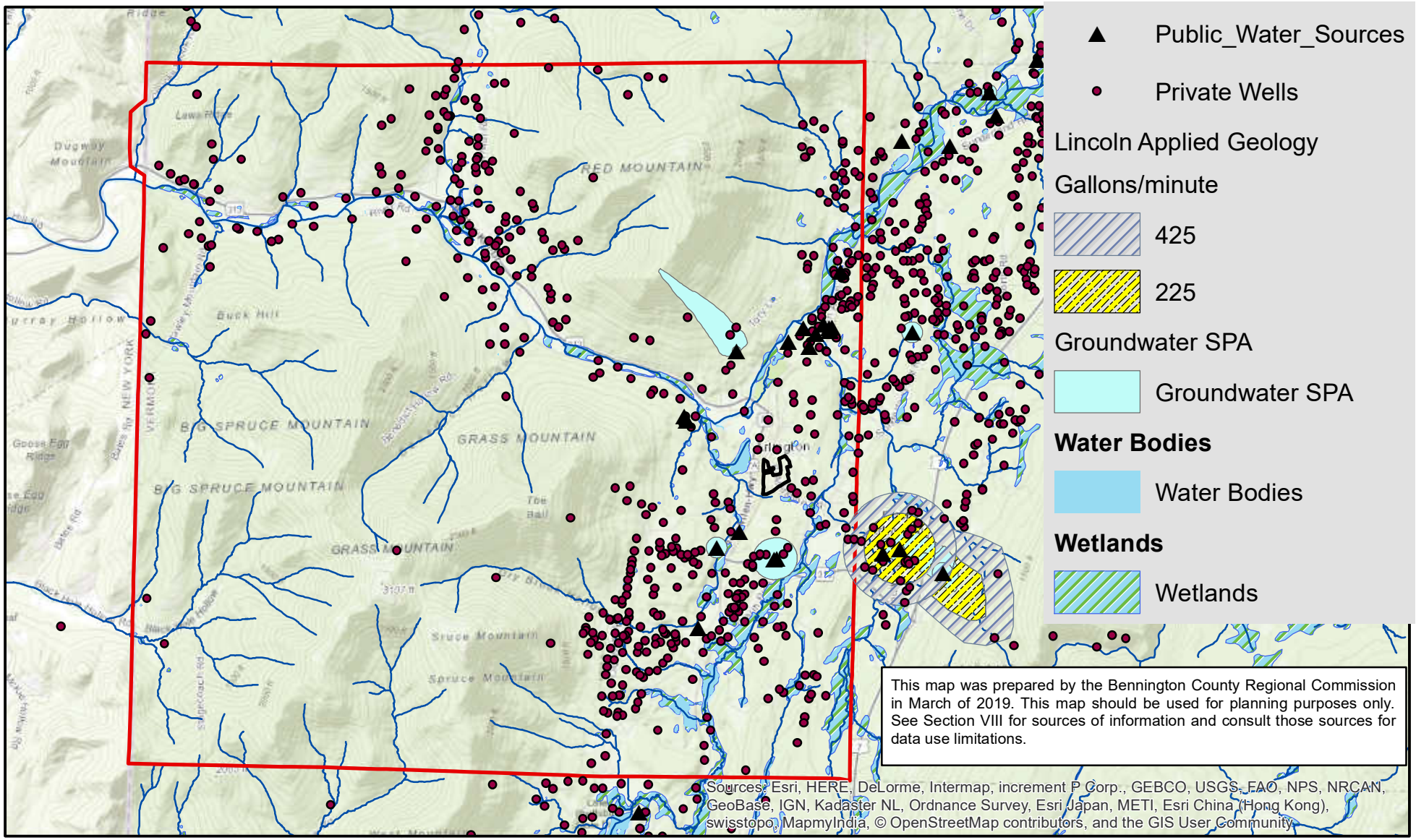


Label	Name
1	Arlington Memorial High School
2	Fisher Elementary School
3	Happy Days Play School
4	Mary Zelinsky
5	Mack Molding Company
6	Mack Molding Company
7	HBH Prestain
8	HBH Prestain
9	Camping on the Battenkill
10	Howell's Campground
11	Shires Housing
12	Shires Housing 409 VT 313 West
13	Shires Housing 31 Battenkill Ln
14	Shires Housing 30 Battenkill Ln
15	Mears Trailer Park

Map 6. Town of Arlington
Special Flood Hazard Zones and River Corridors

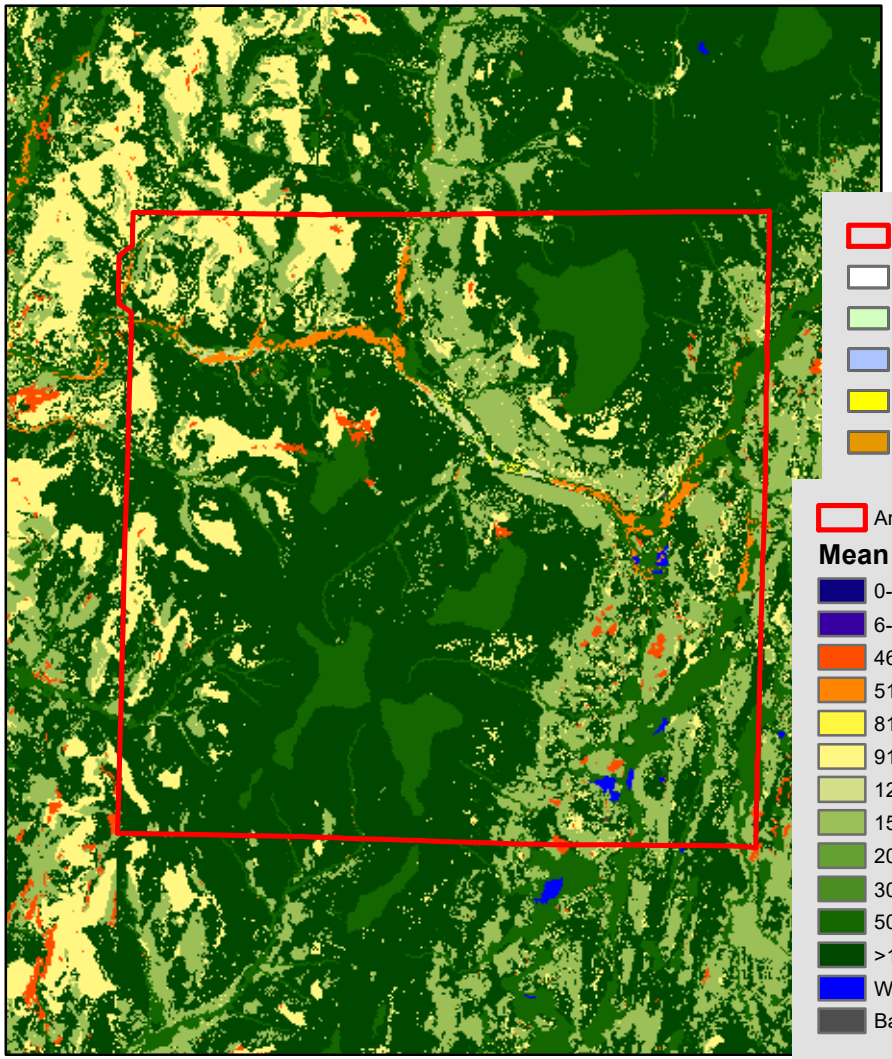


Map 7. Town of Arlington Water Resources

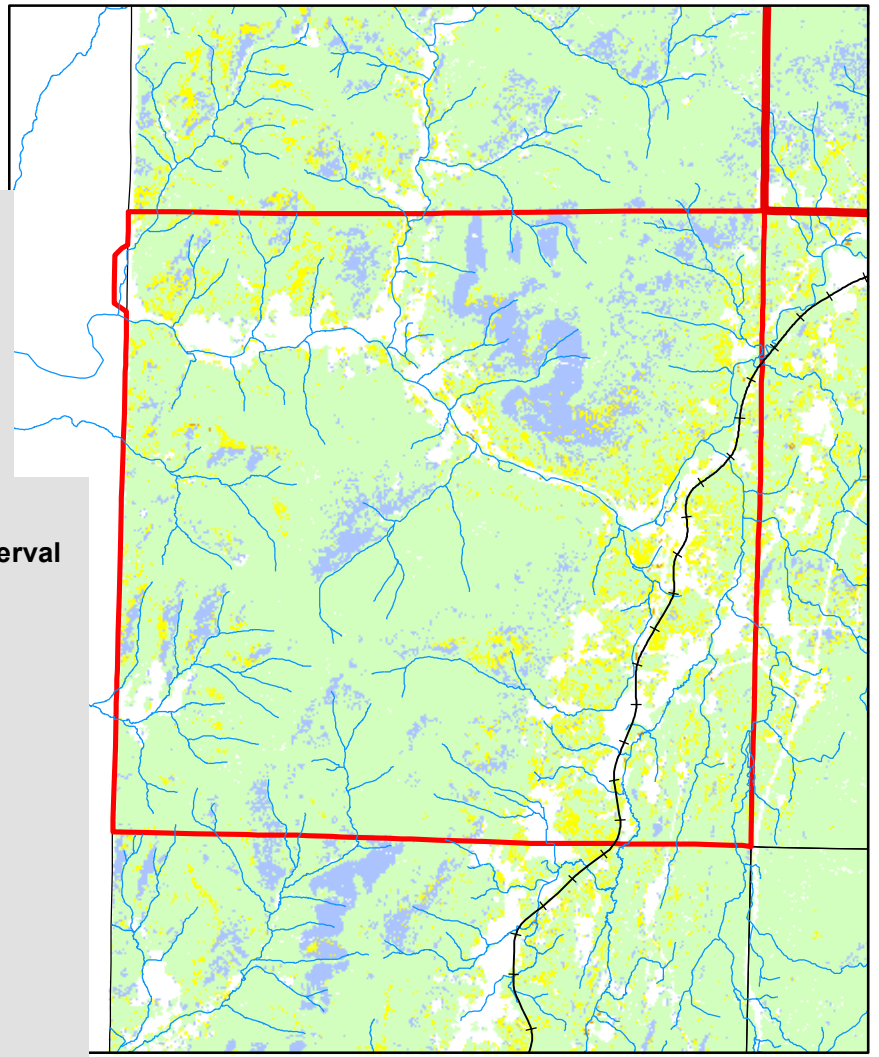


Map 8. Arlington Wildfire Potential

Mean Fire Return Interval



Wildfire Risk



Arlington
No risk
Low
Moderate
High
Very high

Arlington

Mean Return Interval

0-5 Years
6-10 Years
46-50 Years
51-60 Years
81-90 Years
91-100 Years
126-150 Years
151-200 Years
201-300 Years
301-500 Years
501-1000 Years
>1000 Years
Water
Barren

N

0 1.25 2.5 5 7.5 10 Miles

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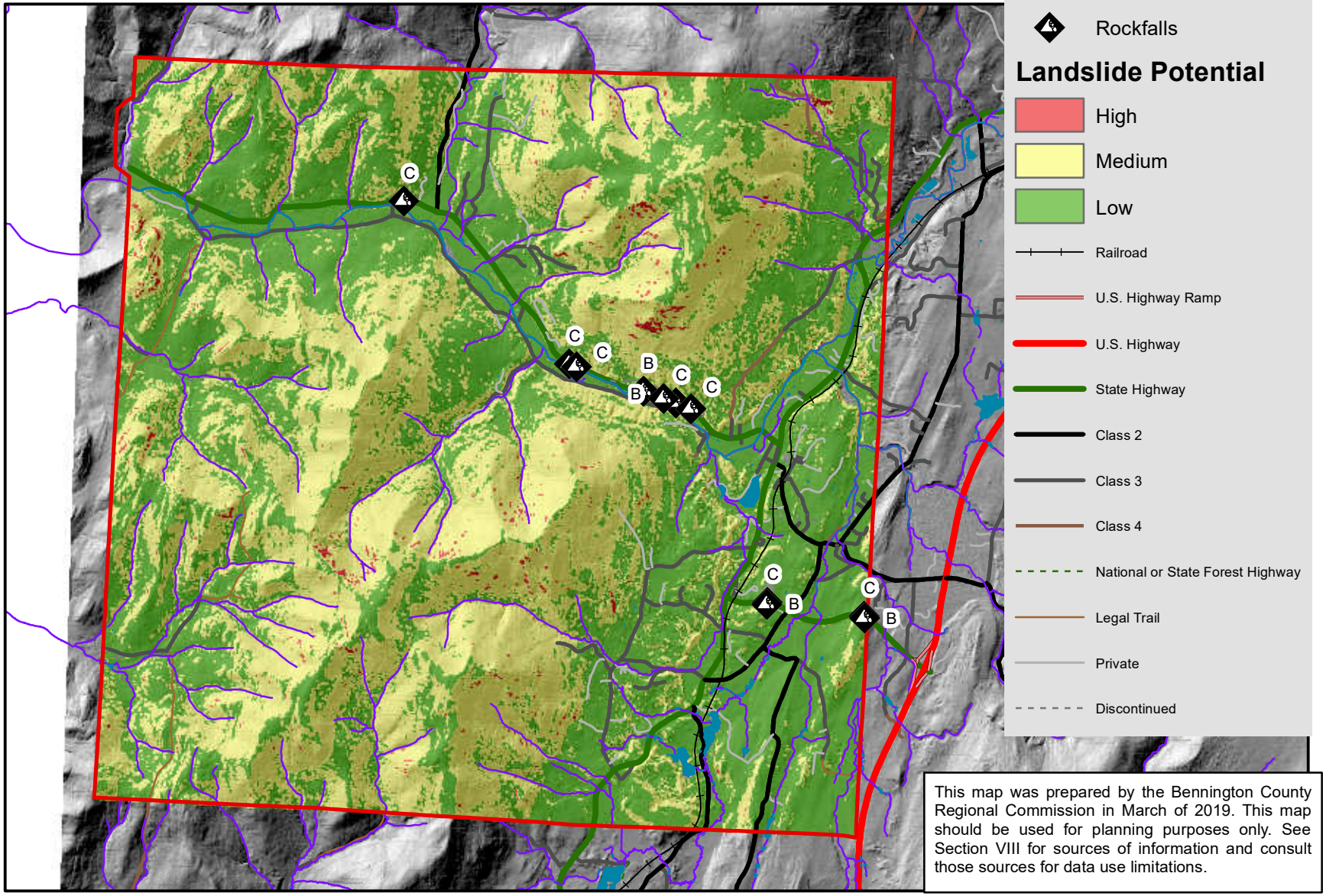
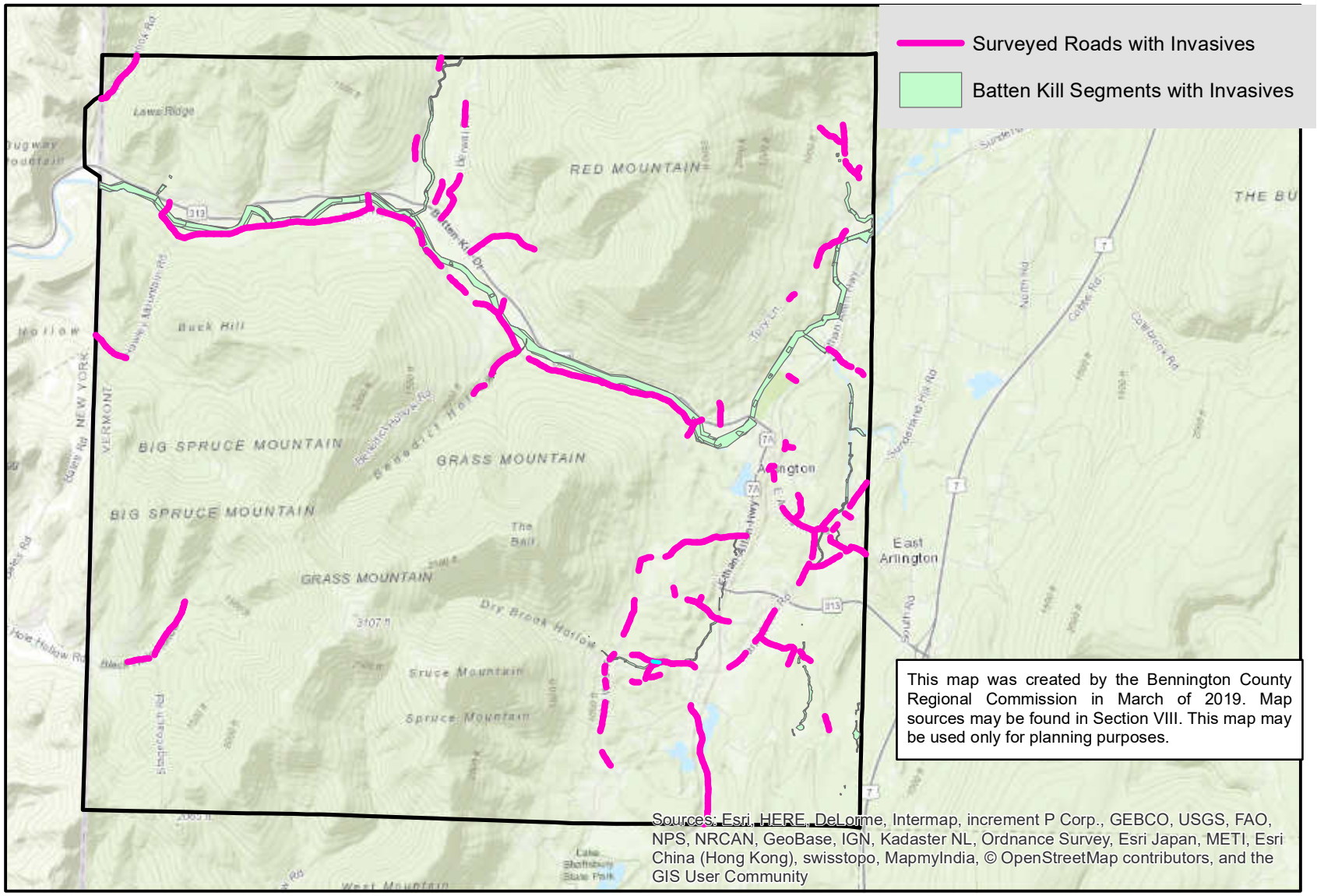
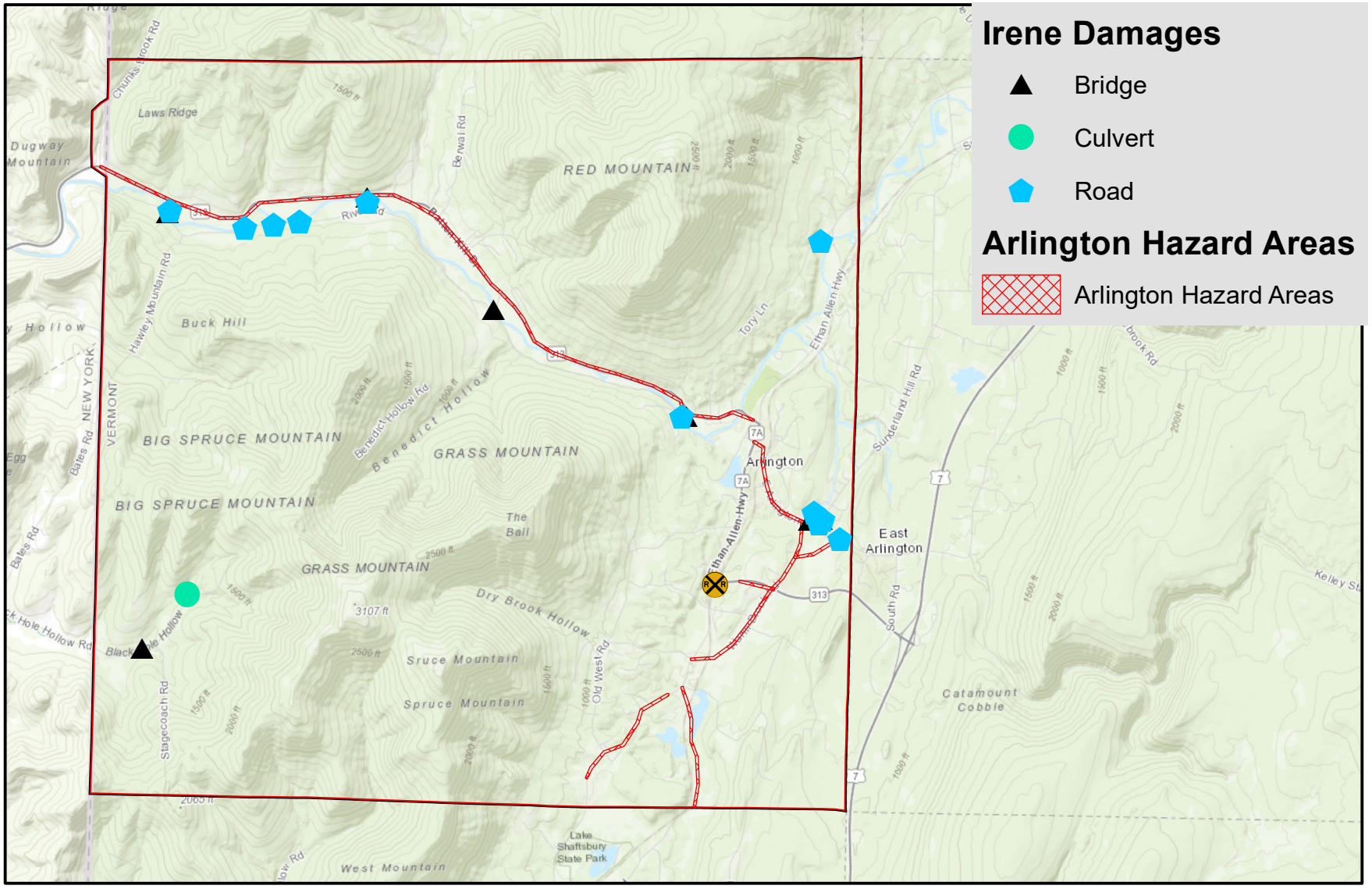
Map 9. Arlington Landslide Potential



Map 10. Arlington Invasive Species



Map 11. Arlington Transportation Hazard Areas Map



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Map 12. Town of Arlington Stormwater Priorities