

Adopted by the Town of Coventry on

Town of Coventry



All-Hazards Mitigation Plan Update

**Town of Coventry Selectboard
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Public Assistance Applicant #: 019-16150-00**

Prepared by:

Town of Coventry, Vermont

CERTIFICATE OF LOCAL ADOPTION

Town of Coventry, Vermont

A Resolution Adopting the All-Hazards Mitigation Plan Update

WHEREAS, the Town of Coventry has worked with its residents and stakeholders to identify its hazards and vulnerabilities, analyze past and potential future losses due to natural and human-caused hazards, and identify strategies for mitigating future losses; and ...

WHEREAS, the Town of Coventry All-Hazards Mitigation Plan contains recommendations, potential actions and future projects to mitigate damage from disasters in Coventry; and

WHEREAS, the Town of Coventry and the respective officials will pursue implementation of the strategy and follow the maintenance process described in this plan to assure that the plan stays up to date and compliant; and...

WHEREAS, a meeting was held by the Town of Coventry Selectboard to formally approve and adopt the Town of Coventry All Hazards Mitigation Plan.

NOW, THEREFORE BE IT RESOLVED that the Town of Coventry adopts this All-Hazards Mitigation Plan for the town.

04-22-2019.

Date Joseph Hallup

Selectman

[Signature]
Selectman

Selectman

[Signature]

Selectboard Chair

[Signature]
Attested to by Town Clerk

Executive Summary

In 2018, the Town of Coventry began to develop this Local All-Hazard Mitigation Plan update from the last approved plan, which was an annex to the 2005 multi-jurisdictional; NVDA Caledonia, Essex and Orleans Counties VT Regional All-Hazards Mitigation Plan. Mitigation planning requirements have changed considerably since 2005 and what once constituted an approved plan for the town holds little value in the current planning environment. While the 2005 plan was certainly reviewed in the update planning process, its value was considered low in moving the town forward with its future mitigation efforts and little, formal incorporation of the 2005 plan into other town planning or operations has occurred. The results of this work are contained herein and represent the collaborative efforts of the Hazard Mitigation Planning Team and associated residents, towns and agencies that contributed to the development of this plan. As hazard mitigation is a sustained effort to permanently reduce or eliminate long-term risks to people and property from the effects of reasonably predictable hazards, the town has communicated its efforts related to developing this plan to its residents and surrounding municipalities, providing a formal opportunity to provide input and review relevant sections of the plan. Along these lines, the town has documented the planning process so that future updates can follow an efficient pattern in addition to capturing this important component as means of establishing institutional memory. In realization that eligibility to receive federal hazard mitigation grants and optimize state-level reimburse or “match” dollars during a federally declared disaster is dependent on a federally approved plan, the town remains committed to sustaining its mitigation efforts and by developing this plan, will have a guide for action that will foster enhanced emphasis on mitigation in the years to come. The town realizes the importance of mitigation inherent to its own resilience as well as means to establishing strong partnerships with regional support agencies and associations, state government and FEMA. As the town moves towards formally adopting this All-Hazards Mitigation Plan update, the purpose of this plan is to:

- Identify specific hazards that impact the town
- Prioritize hazards for mitigation planning
- Recommend town-level goals and strategies to reduce losses from those hazards
- Establish a coordinated process to implement goals and their associated strategies by taking advantage of available resources and creating achievable action steps

This plan is organized into 5 Sections:

Section 1: Introduction and Purpose explains the purpose, benefits, implications and goals of this plan. This section also describes demographics and characteristics specific to the town and describes the planning process used to develop this plan.

Section 2: Hazard Identification expands on the hazard identification in the Town Plan with specific municipal-level details on selected hazards.

Section 3: Risk Assessment discusses identified hazard areas in the town and reviews previous federally-declared disasters to identify what risks are likely in the future. This section presents a hazard risk assessment for the municipality, identifying the most significant and most likely hazards which merit mitigation activity. Building upon the identified hazards from 2005, the updated profiled hazards are introduced in the grid below:

Severe winter/Ice storm	Extreme Cold	Flooding/Erosion
Hazardous Material Incident		

Section 4: Vulnerability Assessment discusses buildings, critical facilities and infrastructure in designated hazard areas and estimates potential losses.

Section 5: Mitigation Strategies begins with an overview of goals and policies in the most recent Town Plan that support hazard mitigation and then formulates a work plan around major infrastructure projects, community awareness and documentation. An analysis of existing municipal actions that support hazard mitigation, such as planning, emergency services and actions of the highway department are also included. The following all-hazards mitigation goals are summarized below:

- 1) Reduce at a minimum, and prevent to the maximum extent possible, the loss of life and injury resulting from all hazards.
- 2) Mitigate financial losses and environmental degradation incurred by municipal, educational, residential, commercial, industrial and agricultural establishments due to various hazards.
- 3) Maintain and increase awareness amongst the town’s residents and businesses of the damages caused by previous and potential future hazard events as identified specifically in this Local All-Hazards Mitigation Plan.
- 4) Recognize the linkages between the relative frequency and severity of disaster events and the design, development, use and maintenance of infrastructure such as roads, utilities and storm water management and the planning and development of various land uses.
- 5) Maintain existing municipal plans, programs and ordinances that directly or indirectly support hazard mitigation.
- 6) Develop a mechanism for formal incorporation of this Local All-Hazards Mitigation Plan into the municipal comprehensive plan as described in 24 VSA, Section 4403(5). This mechanism will be developed by the Planning Commission, Selectboard and NVDA and integrate the strategies into the existing town plan as annexes until the next formal update occurs, where a section devoted to mitigation planning will be integrated into the plan.
- 7) Develop a mechanism for formal incorporation of this Local All-Hazards Mitigation Plan, particularly the recommended mitigation actions, into the municipal/town operating and capital plans & programs as they relate to public facilities and infrastructure within political and budgetary feasibility. The Planning Commission will review the updated LHMP and use language/actions from it to inform the integration and future update processes. Town Meeting Day will serve as the formal time that mitigation strategy budgetary considerations will be approved and incorporated into the town budget.

Section 5 also identifies and provides a detailed discussion on the following mitigation actions:

Action #1: Improve road infrastructure and municipal systems protection programs

Action #2: Improve resilience to severe winter storms

Action #3: Reduce impact of extreme cold durations

Action #4: Raise public awareness of hazards and hazard mitigation actions

Action #5: Continue fluvial geomorphology assessments in collaboration with DEC and develop strategies and regulatory actions in response to identified

Action 6: Reduce risk and impact of hazardous materials incident

In conclusion, Section 5 provides an Implementation Matrix to aid the municipality in implementing the outlined mitigation actions with an annual evaluation process to be coordinated and administered by the Planning Commission.

Table of Contents

SECTION 1: INTRODUCTION AND PURPOSE	7
1.1 Purpose and Scope of this Plan	7
1.2 Hazard Mitigation	7
1.3 Hazard Mitigation Planning Required by the Disaster Mitigation Act of 2000	7
1.4 Benefits	8
1.5 All-Hazards Mitigation Plan Goals.....	8
1.6 Community History and Background	9
1.7 Summary of Planning Process	11
SECTION 2: HAZARD IDENTIFICATION.....	14
2.1 Natural Hazards Overview.....	15
Table 2-1: Summary of Vermont Emergency Declarations	15
2.1.1. Profiled Hazards.....	16
An Introduction to Climate Change:.....	16
Severe Winter Storm.....	17
Table 2-3: NOAA’s Regional Snowfall Index (RSI) and Coventry Snowfall vs. U.S. Average.....	18
Coventry Snowfall vs. U.S. Average	18
Ice Storm.....	19
Extreme Cold	19
Table 2-4: Coventry Temperature Ranges vs. National Average	20
Flooding	20
Table 2-5: 24-Hour Rainfall Depths (inches) for Common Recurrence Intervals (ANR, 2002)	20
Table: 2-6: Orleans County Rainfall-Intensity Range (in. /hr.)	21
Flood Vulnerability.....	21
Table 2-7: Coventry Precipitation vs. U.S. Average	23
Inundation and Floodplains.....	23
Fluvial Erosion.....	24
SECTION 3: RISK ASSESSMENT.....	26
3.1 Designated Hazard Areas.....	26
3.1.1. Flood Hazard Areas	26
3.1.2. Fluvial Erosion Hazard Areas	26
3.2 Non-designated Hazard Areas	27

3.2.1. Ice Storm Damage.....	27
3.2.2. High Winds and Lightning.....	27
3.3 Previous FEMA-Declared Natural Disasters and Non-Declared Disasters.....	27
Table 3-1: KEY:.....	27
Table 3-2: FEMA-declared disasters and snow emergencies, 2005-Current:	28
3.3 Hazard Assessment and Risk Analysis.....	29
3.3.1. Natural Hazards	30
3.4 Hazard Summary	32
SECTION 4: VULNERABILITY ASSESSMENT AND LAND USE	32
Table 4-1: Vulnerability Summary Table.....	34
4.1 Water, Wastewater and Electric Power Service	35
4.2 Estimating Potential Losses in Designated Hazard Areas	36
4.3 Proposed Land Use and Development Trends Related to Mitigation.....	36
4.3.1. Land Use Goals.....	37
4.3.2. Land Use Strategies	37
4.3.4 Future Development and Housing	37
SECTION 5: MITIGATION STRATEGIES	38
5.1 Town Goals and Policies that support Hazard Mitigation.....	38
5.1.1. Community Goals.....	38
5.1.2. Capital Improvement Goals	39
5.1.3. Public Participation Goals.....	39
5.1.4. Regulatory Devices Goals.....	39
5.1.5. Land Use	39
5.1.6 Natural Resources	40
5.1.7. Policies.....	41
5.1.8. Transportation Plan.....	41
5.1.9. Utilities and Facilities Goals.....	42
5.1.9.1. Educational Goals	42
5.2 Existing Town of Coventry Actions that Support Hazard Mitigation	42
5.2.1. Flood Resilience Goals:	44
5.2.2. Flood Resilience Strategies:.....	44
5.3 All-Hazards Mitigation Goals.....	45
5.4 Mitigation Actions	46

5.4.1. Current Capabilities, Progress since 2005 and Need for Mitigation Actions	46
5.4.2. Specific Mitigation Actions	47
5.4.3. Prioritization of Mitigation Strategies	54
5.5 Implementation and Monitoring of Mitigation Strategies	55
5.5.1. Public Involvement Following Plan Approval	55
5.5.2. Project Lead and Monitoring Process	56
5.5.4. Plan Update Process.....	56
5.5.5. Implementation Matrix for Annual Review of Progress.....	57
Appendix A: Community Reports: Coventry (Flood Ready Vermont).....	73
Appendix B: Culvert Locator: (VTrans).....	73
Appendix C: No Adverse Impact Floodplain Management Fact Sheet (ASFPM).....	73
Appendix D: Farm Structures in Designated Flood Hazard Area Planning Checklist (VAAFMM) 73	
Appendix E: Community Outreach Form.....	74

SECTION 1: INTRODUCTION AND PURPOSE

1.1 Purpose and Scope of this Plan

The purpose of this All-Hazards Mitigation Plan Update is to assist this municipality in identifying all hazards facing their community and in identifying strategies to begin to reduce the impacts of those hazards. The plan update also seeks to better integrate and consolidate efforts of the municipality with those outlined in the Town Plan as well as efforts of NVDA, Vermont State agencies, FEMA and the State Hazard Mitigation Plan. The town is aware that community planning can aid significantly in reducing the impact of expected, but unpredictable natural and human-caused events. Community planning can aid significantly in reducing the impact of expected, but unpredictable natural and human-caused events. The goal of this plan is to provide hazard mitigation strategies to aid in creating disaster resistant communities throughout Orleans County.

1.2 Hazard Mitigation

The Vermont State All-Hazards Mitigation Plan of 2013 defines hazard mitigation as:

“Any sustained action that reduces or eliminates long-term risk to people and property from natural and human-caused hazards and their effects. The Federal Emergency Management Agency (FEMA) and state agencies recognize that it is less expensive to prevent disaster or mitigate its effects than to repeatedly repair damage after a disaster has struck. This plan recognizes that communities have opportunities to identify mitigation strategies and measures during all of the other phases of Emergency Management—Preparedness, Response and Recovery. Hazards cannot be eliminated, but it is possible to determine what the hazards are, where they are, where they are most severe and to identify actions that can reduce the severity of the hazard.”

Hazard mitigation strategies and measures can reduce or eliminate the frequency of a specific hazard, lessen the impact of a hazard, modify standards and structures to adapt to a hazard, or limit development in identified hazardous areas. This plan aligns and/or benefits from the 5 goals accomplished as a State since 2010 and as referenced in Section 5 of the State’s 2013 Hazard Mitigation Plan and as part of the newly created Emergency Relief Assistance Funding (ERAF) requirements. With enhanced emphasis on community resiliency, many state agencies and local organizations have an increased awareness of the importance of mitigation planning and have produced plans and resources that towns can use to support their planning efforts. This plan will reference, when relevant, pertinent tools and resources that can be used to enhance mitigation strategies.

1.3 Hazard Mitigation Planning Required by the Disaster Mitigation Act of 2000

Hazard mitigation planning is the process that analyzes a community’s risk from natural hazards, coordinates available resources, and implements actions to reduce risks. Per *44 CFR Part 201: Hazard Mitigation Planning*, this planning process establishes criteria for State and local hazard mitigation planning authorized by Section 322 of the Stafford Act as amended by Section 104 of the *Disaster Mitigation Act of 2000*. Effective November 1, 2003, local governments now must have an approved local mitigation plan prior to the approval of a local mitigation project funded through federal Pre-Disaster Mitigation funds. Furthermore, the State of Vermont is required to

adopt a State Pre-Disaster Mitigation Plan for Pre-Disaster Mitigation funds or grants to be released for either a state or local mitigation project after November 1, 2004.

There are several implications if the plan is not adopted:

- After November 1, 2004, Flood Mitigation Assistance Grant Program (FMAGP) funds will be available only to communities that have adopted a local Plan
- For disasters declared after November 1, 2004, a community without a plan is not eligible for HMGP project grants but may apply for planning grants under the 7% of HMGP available for planning
- For the Pre-Disaster Mitigation (PDM) program, a community may apply for PDM funding but must have an approved plan to receive a PDM project grant
- For disasters declared after October 14th, 2014, a community without a plan will be required to meet a greater state match when public assistance is awarded under the ERAF requirements (Emergency Relief Assistance Funding)

1.4 Benefits

Adoption and maintenance of this Hazard Mitigation Plan will:

- Make certain funding sources available to complete the identified mitigation initiatives that would not otherwise be available if the plan was not in place
- Lessen the receipt of post-disaster state and federal funding because the list of mitigation initiatives is already identified
- Support effective pre-and post-disaster decision making efforts
- Lessen each local government's vulnerability to disasters by focusing limited financial resources to specifically identified initiatives whose importance have been ranked
- Connect hazard mitigation planning to community planning where possible

1.5 All-Hazards Mitigation Plan Goals

This All-Hazards Mitigation Plan establishes the following general goals for the town and both villages and their residents:

- 1) Reduce at a minimum, and prevent to the maximum extent possible, the loss of life and injury resulting from all hazards.
- 2) Mitigate financial losses and environmental degradation incurred by municipal, educational, residential, commercial, industrial and agricultural establishments due to various hazards.
- 3) Maintain and increase awareness amongst residents and businesses of the damages caused by previous and potential future hazard events as identified specifically in this Local All-Hazards Mitigation Plan.
- 4) Recognize the linkages between the relative frequency and severity of disaster events and the design, development, use and maintenance of infrastructure such as roads, utilities and storm water management and the planning and development of various land uses.

- 5) Maintain existing municipal plans, programs and ordinances that directly or indirectly support hazard mitigation.
- 6) Develop a mechanism for formal incorporation of this Local All-Hazards Mitigation Plan into the multi-jurisdictional municipal comprehensive plan as described in 24 VSA, Section 4403(5). This mechanism will be developed by the Joint Planning Commission, Selectboard and NVDA and integrate the strategies into the existing town plan as annexes until the next formal update occurs, where a section devoted to mitigation planning will be integrated into the plan.
- 7) Develop a mechanism for formal incorporation of this Local All-Hazards Mitigation Plan, particularly the recommended mitigation actions, into municipal operating and capital plans & programs as they relate to public facilities and infrastructure within political and budgetary feasibility. The Joint Planning Commission will review the plan and use language/actions from it to inform the integration and update process. Town Meeting Day will serve as the formal time that mitigation strategy budgetary considerations will be approved and incorporated into the town budgets

1.6 Community History and Background

“Coventry can be categorized as an agriculturally based bedroom community. Its immediate future seems to be tied to the stability of its farming community and the growth of the commercial and industrial bases of its surrounding communities. As long as the town continues to offer comparatively low property taxes; a well-balanced educational program; unrestricted residential development sites; and a beautiful rural setting, it will continue to attract new residential growth. The State of Vermont owns and manages several large parcels of land in the town. These lands are restricted, for the most part, to their current use or to public recreational uses. These lands include the Newport State Airport property and the South Bay Wildlife Management Area. There are a number of smaller tracts of land along the Black River that are owned and regulated by the State Fish and Wildlife Agency. A large tract of land bordering the South Bay of Lake Memphremagog is under the control of the State of Vermont. This area is called the South Bay Wildlife Management Area. An additional tract of land that parallels the shores of the Black River has been designated as a wetland district and is also under the protection of the state. Both of these areas can be entered for limited recreational uses.

Areas along the banks of the Barton River, the Black River (which flows through the Village of Coventry), Stony Brook, Day Brook, Alder Brook and Trout Brook, have been identified as flood plain areas. These areas are extremely fragile and should continue to be protected from development. In addition, development within these areas should be carried out in a manner that not only protects the environment but the development as well. Floodwaters can cause a great deal of damage to structures that are not built using flood resistant materials and techniques.

Such damage can be expensive to repair and can also be detrimental to existing development and the environment as well. The Town of Coventry is a member of the National Flood Insurance Program (NFIP). With the exception of a flood hazard area regulation, Coventry is a non-regulated town. It has no zoning or subdivision regulations. With the exception of Coventry Village, residents of Coventry do not enjoy the benefits of a municipal water system. Most of the homes, farms, and businesses in the community develop their own water supplies, using surface, or artesian wells. Some of the homes and businesses located in Coventry Village are serviced by a system owned and maintained by the Coventry Fire District. This system includes: a gravel-packed well, a pump rated at 65 gpm, a chemical control room; a 100,000 gallon concrete storage reservoir; and a number of 2", 4" and 6" transmission lines and distribution mains. The system serves homes along Town Roads 7, 36, and 54. Due, in part, to scattered development trends, and the adverse economic impact, Coventry has no current plans to develop a town wide water system. Coventry does not provide a municipal sewage system. All homes, farms and businesses located in the town, are dependent on septic systems for sewage disposal. Coventry has no current plans to develop a town wide sewer system. Coventry has a privately owned landfill site, which has been developed on a tract of land bordering Town Route 2, that handles solid waste disposal. As the states only solid waste facility, this is a major landfill that causes heavy truck traffic. There are up to 50+ large trucks each day. There have been a few fires with trucks that catch fire. Vermont Electric Cooperative provides the electric power required by most of the town. In addition, the Orleans Electric Department serves two small areas of the town. Those two areas are located along the town's eastern boarder and the town's southern most tip. Single phase and three-phase power is distributed throughout the community. Three-phase service is currently restricted to the western portion of the town. At this time, the power companies assure us that there is a sufficient amount of electricity available to supply the Town's expanding residential requirements. No electric power is generated within the town limits. Vermont Electric Cooperative provides the electric power required by most of the town. In addition, the Orleans Electric Department serves two small areas of the town. Those two areas are located along the town's eastern boarder and the town's southern most tip. Single phase and three-phase power is distributed throughout the community. Three-phase service is currently restricted to the western portion of the town. At this time, the power companies assure us that there is a sufficient amount of electricity available to supply the Town's expanding residential requirements. No electric power is generated within the town limits.

The town is served by 16.4 miles of State Highways and 36 miles of Town Highways.⁷ Interstate Highway 91 runs the length of the Town's eastern border but does not offer the town an interchange. The Washington County Connecticut River Subdivision railroad traverses north-south through the town and there is a state-owned airport in town. The railroad has filed Chapter

11 but they still haul freight, including propane and other hazardous materials, once per day, both north and south. State Route 5, running north to south, serves as the Town's major link with Newport City and Derby to the north, and Irasburg, Interstate 91 and Orleans, to the south. State Route 14, also a north to south highway, serves as the town's major link to Newport Town to the north and numerous communities to the south. State Aid Route 2 provides a direct route from Newport City and Interstate 91 to both the State Airport and the Waste U.S.A. landfill site. Interstate 91 runs through the eastern portion of the Town. However, access to Interstate 91 within the Town of Coventry is not possible.” (2018 Town Plan)

1.7 Summary of Planning Process

The work to update this plan was led by the planning team made up of municipal officials, school officials, local businesses, service agencies, and the regional planning organization (NVDA). The update project followed a work plan which provided the public and other stakeholders the opportunity for two-way communication. Existing documents were also researched and incorporated into the plan update.

Planning team members, for the most part, fulfill multiple roles in the community and represent a broad array of stakeholders. The following table presents the Planning Team members and their title:

2018-19 Coventry Mitigation Planning Team Roster

Casella Waste Management	Joe Gay
Coventry Village School	Todd Rohlen
Emergency Management Director	Scott Morley
Northeast Kingdom International Airport	Dan Gauvin
Planning Commission	Moe Jacobs, Skip Gosselin, Israel Sanville, Phil Marquette, Carol Simmons

Recreation Committee	Martha Sylvester
Road Commissioner	David Gallup
Select Board	Scott Briere
Select Board	Brad Maxwell
Select Board Chairman	Mike Marcotte
Town Administrator	Amanda Carlson
Town Clerk	Deb Tanguay
Zoning Administrator	David Barlow

The last approved plan for the town was in 2005. This approval came after formal adoption of an Annex of the NVDA-developed, 2005 Northeast Kingdom Multi-Jurisdictional Hazard Mitigation Plan. The 2005 plan was all-but forgotten and is considered too general and basic for current mitigation planning needs and requirements. While the town, by default of daily operations, experience with major disasters since 2005 and advancements in mitigation planning and guidance from state agencies, has enhanced its mitigation efforts since 2005, these enhancements were not a direct result of the 2005 plan. There is a current understanding of the need to integrate the content of this update and its goals, actions and reporting into the daily operational structure and awareness of all town officials so that mitigation planning establishes itself as a consistent topic of concern and discussion. The planning team was developed, representing the community and regional partners as best as possible and planning updates were given consistently at warned, community meetings. June 4th, 2018 marked the kick-off meeting at a normally scheduled selectboard meeting. Both disaster history and planning requirements were discussed with a list of next steps. Additionally, a survey was drafted asking for community input and made available through the town’s standard public notification process with access in the town office. The survey introduced the importance and informational needs of a LHMP and

asked for specific concerns the resident and/or business owner had. All neighboring towns were sent notification via the town clerk of the plan's development and subsequent drafts and were given an opportunity to provide input through email and/or phone call to the town clerk. No responses were obtained from this solicitation. Following FEMA guidance in Local Mitigation Plan Review Tool Regulation Checklist, the plan was written using data sources that included:

- Surveys and warned, public meetings collecting public comment (issues raised were addressed in plan and the public meeting)
- 2018 Town Plan (provided current goals and regulations supporting mitigation, recent capital expenditures and infrastructure value helped to drive vulnerability assessment)
- 2013 Vermont State Hazard Mitigation Plan (provided key guidance language and definitions throughout the plan).
- Vermont Agency of Natural Resources (ANR) and Transportation (VTrans) (Provided key policy recommendations on environmental conservation, high accident locations, climate change and fluvial erosion data).
- Vermont Departments of Health (VDH) and Environmental Conservation (DEC) (provided information related with public health services that could be impacted during a disaster and state support functions designated to both VDH and DEC. DEC also provided river corridor data for mapping purposes.
- FEMA Open Source (data.gov) Data for Disaster History and PA funding (provided comprehensive declared disaster by year and type as well as project descriptions and cost per event).
- FEMA NFIP "Bureau.Net" database (provided detailed information on repetitive loss properties and associated flood insurance claims).
- EPA's Incident Action Checklist for cold weather resilience of water systems (provides a guidance tool for public works to cross-reference actions on the system).
- 2013 ACCD Mobile Home Resilience Plan (served as resource for future mitigation actions)

Based on the information obtained, input from town and state officials, the planning team, state and federal databases, local associations and NVDA, the plan was created. While many small communities in Vermont face similar circumstances (e.g. flooding, winter storms and remote residents), each one has unique considerations and opportunities. There was a point made to capture the subtle characteristics of the town and its distinct villages. From this, the specific risks, vulnerabilities and mitigation strategies were developed and applicable, broken down to the specific entity impacted. NVDA's role in assisting the entire region with all facets of planning provided crucial information and NVDA's Emergency Management Planning representative attended planning team meetings and provided guidance. While the LEPC provides the best platform to engage representatives from various towns and agencies, all bordering towns were contacted with planning objectives and asked to provide input through a formal email invitation. Vermont Emergency Management (VEM) also provided information during the development of the plan. VEM also has representation at the LEPC meetings and will

continue to provide input and guidance as the town moves forward with their mitigation strategies. On August 6, 2018, there was a warned meeting to review updated profiled hazards and risk analysis. From the August 6th date, emails were sent by the technical consultant to the planning team for review and comment on the draft sections of the update.

On February 4th, 2019, there was a warned public meeting to review the identified hazards and associated mitigation strategies. Comments obtained focused on language related to the landfill operating capabilities and descriptive preferences as well as the increased traffic resulting from the location. Additional results of the meeting clarified status of the dredging project which completed phase in the summer of 2018. NFIP management at the town was also discussed. The draft plan was then revised based on input and presented to the town. Much of the input from residents (e.g. survey results) focused on road resilience and snow removal. Survey results are included in the appendix. The revised draft was made available for review at the town office and residents were informed via meeting minutes and the town bulletin board of the ability to review the draft and additional opportunity for formal comment and suggestions. Minor edits were made to the plan following state recommendations and the final draft was resubmitted to VEM and then to FEMA for formal review and approval pending municipal adoption. A resolution of adoption will occur following FEMA review and “approval pending adoption” status.

SECTION 2: HAZARD IDENTIFICATION

The 2005 Plan profiled the following hazards (bold indicates continued inclusion in this update):

- **flooding**
- **hazardous materials**
- radiological incident
- power failure
- **winter storm/ice**
- **high winds**
- aircrash
- chemical or biological incident
- highway incidents

For this update, the planning team considered the continued inclusion or deletion of the 2005 hazards profiled by developing and researching the natural hazard categories outlined in the state mitigation plan and for each, considered prior history, current trends and available data to estimate risk. As highlighted above, some profiled hazards remain a risk for the town. However, other hazards, due to lack of occurrence frequency, risk and/or vulnerability have been removed in this update. The one addition to this update’s profiled hazard category is *extreme cold*. The definitions of each hazard, along with historical occurrence and impact, are described below.

- **Natural Hazards:** weather / climate hazards (drought, hurricane/tornado, high winds, severe winter storm, extreme temperatures, climate change, lightning, hail), flooding, geological hazards (landslide / erosion, earthquake, naturally-occurring radiation), and fire hazards.

Profiled Natural Hazards: Severe Winter Storm/Ice, Flooding, Extreme Cold Temperature

2.1 Natural Hazards Overview

The number of natural disasters in Orleans County (14) is near the US average (12). There have been 13 major disasters (Presidential) declared and three emergencies declared. The causes of the natural disasters have been; Floods: 2; Storms: 7; Winds: 2; Heavy Rain; 1 Landslide: 1; Snowstorm: 2; Tropical Storm: 1 (Note: Some incidents may be assigned to more than one category). The following discussion on natural hazards is based upon information from several sources but specific extent data for Albany was largely not available. However, Orleans County and specifically, nearby Newport City data can be used to capture the extent of natural hazard events for the town. General descriptions are based upon the *2013 Vermont State Hazard Mitigation Plan*. According to NOAA Storm data, there were over 460 severe weather events from 1995-2015 in Orleans County. Events specific to the town, in addition to declared disasters include:

- 9/6/98, 6/26/02 thunderstorms
- 5/29/12 hail/tornado
- 7/29/13 flash flood

The highest risk hazards (severe winter/ice storm, flooding, extreme cold and hazardous materials incident) have been profiled to provide the basis of future mitigation strategies. However, lower risk natural hazards (drought, tornado, tornado, high winds, extreme heat, hail, landslide, earthquake, naturally-occurring radiation, hurricanes and fire hazards) are omitted from full profiling because they do not pose enough risk to substantiate mitigation efforts at this time. However, impacts from hurricanes are addressed under flooding hazard.

Table 2-1: Summary of Vermont Emergency Declarations

Number	Year	Type
3338	2011	Hurricane Irene
3167*	2001	Snowstorm
3053	1977	Drought

Source: FEMA

Table 2-2: Summary of Vermont Major Disaster Declarations since 1998 (Orleans County: Bold and “” denotes Town PA received)*

Number	Year	Type
4380	2018	Severe Storms and Flooding
4356	2018	Severe Storms and Flooding
4330	2017	Severe Storms and Flooding

4207	2015	Severe Winter Storm
4232	2015	Severe Storms and Flooding
4178	2014	Severe Storms and Flooding
4163*	2014	Severe Winter Storm
4140	2013	Severe Storms and Flooding
4120	2013	Severe Storms and Flooding
4066	2012	Severe Storms, Tornado and Flooding
4043	2011	Severe Storms and Flooding
4022*	2011	Tropical Storm Irene
4001	2011	Severe Storms and Flooding
1995*	2011	Severe Storms and Flooding
1951	2010	Severe Storm
1816	2009	Severe Winter Storm
1790	2008	Severe Storms and Flooding
1784	2008	Severe Storms, Tornado and Flooding
1778	2008	Severe Storms and Flooding
1715	2007	Severe Storm, Tornado and Flooding
1698	2007	Severe Storms and Flooding
1559*	2004	Severe Storms and Flooding
1488	2003	Severe Storms and Flooding
1428*	2002	Severe Storms and Flooding
1358	2001	Severe Winter Storm
1336	2000	Severe Storms and Flooding
1307	1999	Tropical Storm Floyd
1228	1999	Severe Storms and Flooding
1201	1998	Ice Storm

2.1.1. Profiled Hazards

An Introduction to Climate Change:

From 1962 to 2006, each five-year period resulted in 0-6 Major Disaster Declarations in Vermont. From 2007-2018, there were 21. It is commonly accepted that weather extremes are becoming more commonplace in Vermont. Since 2011, record setting snow, rain and cold have been experienced in the state. In recent years, it has become evident that human activities, mostly associated with the combustion of fuel, have added to the natural concentration of greenhouse gases in the atmosphere and are contributing to rapid climate change on a global scale. While projections of the effects of climate change vary, it is generally predicted that Vermont will have warmer temperatures year-round, with wetter winters and drier summers. An increase in the size and frequency of storms is also predicted. Thus, climate change in the next century will likely increase the chance of weather-related hazards occurring. An increase in precipitation may also result in increased flooding and fluvial erosion. Drier summers may increase the chance of drought and wildfire. A warmer climate may also result in the influx of diseases and pests that cold winters previously prevented. The severity of climate change is also difficult to predict, though the effects may be mitigated somewhat if greenhouse gas emissions are reduced soon. In

2011, Governor Shumlin formed the *Vermont Climate Cabinet*. The Cabinet, chaired by the Secretary of Natural Resources, is a multidisciplinary approach to enhance collaboration between various state Agencies. Its primary objectives include providing the Governor with advisory information and facilitating climate change policy adoption and implementation. In 2013, the Vermont Agency of Natural Resources (ANR) released the Climate Change Adaptation Framework which addresses climate change exposures, vulnerability-specific elements within each of the natural resource sectors, and ongoing and proposed actions that can be or have been taken to prepare for the expected changes. In line and in conjunction with the ANR report, the primary goal of a VTrans climate change adaptation policy is to minimize long-term societal and economic costs stemming from climate change impacts on transportation infrastructure.

Severe Winter Storm

Winter storms impact the entire planning area. According to the *2013 Vermont State All-Hazards Mitigation Plan*:

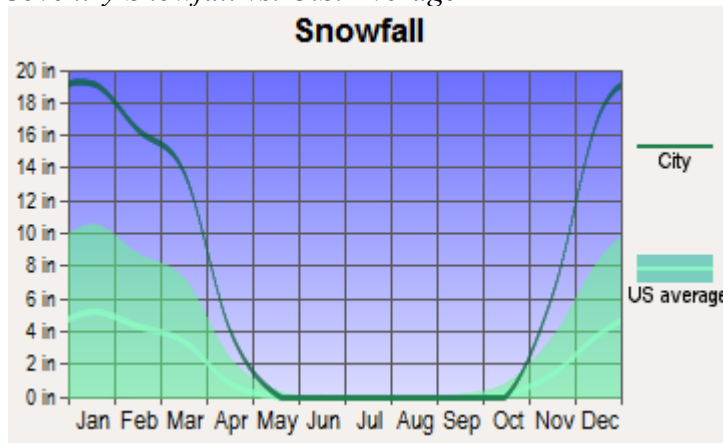
“A winter storm can range from moderate snow to blizzard conditions. A severe winter storm deposits four or more inches of snow during a 12-hour period or six inches of snow during a 24-hour period. A blizzard is a snowstorm with sustained winds of 40 miles per hour or more with heavy falling or blowing snow and temperatures of ten degrees Fahrenheit or colder. An ice storm involves rain, which freezes upon impact. Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires, and similar objects and to produce widespread power outages.”

Winter storm frequency and distribution varies from year to year depending on the climatological patterns but snowfall in the town is significantly higher than the national average. County-wide, the winter of 2010-2011 was the third-snowiest on record with a total of 124.3 inches. The record of 145.4 inches was set in 1970-1971. The potential for a major snowstorm that exceeds the capabilities of town exists every year but with the recent increase in snowfall totals and cold temperature duration, the town realizes that further consideration is required. NOAA's National Centers for Environmental Information is now producing the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two thirds of the U.S. The RSI ranks snowstorm impacts on a scale from 1 to 5, similar to the Fujita scale for tornadoes or the Saffir-Simpson scale for hurricanes. NCEI has analyzed and assigned RSI values to over 500 storms going as far back as 1900. As such, RSI puts the regional impacts of snowstorms into a century-scale historical perspective. The index is useful for the media, emergency managers, the public and others who wish to compare regional impacts between different snowstorms. The RSI and Societal Impacts Section allows one to see the regional RSI values for particular storms as well as the area and population of snowfall for those storms. The area and population are cumulative values above regional specific thresholds. For example, the thresholds for the Southeast are 2", 5", 10", and 15" of snowfall while the thresholds for the Northeast are 4", 10", 20", and 30" of snowfall. 2010, 2012 and 2015 have some of the highest rankings for notable storms in Coventry. These rankings are based, in part on the severity of the storm using the following system. Since 2000, there has only been one event that reached a category 4 in the Northeast, five reached Category 3, eight were “significant” and all others were notable.

Table 2-3: NOAA’s Regional Snowfall Index (RSI) and Coventry Snowfall vs. U.S. Average

CATEGORY	RSI VALUE	DESCRIPTION
1	1–3	Notable
2	3–6	Significant
3	6–10	Major
4	10–18	Crippling
5	18.0+	Extreme

Coventry Snowfall vs. U.S. Average



Regionally, the winter of 2010-2011 was the third-snowiest on record with a total of 124.3 inches. The Town has seen damage from declared snow disasters in the past, primarily dealing with debris removal from downed trees. In any Vermont community, this potential exists every winter. While there is no record of snowfall for Coventry, nearby Newport City had the following events which serve to reflect the extent with which snow can impact the area. In January of 2015 received 28’’ of snow compared to only 11.3’’ in 2014. Historic January snowfall totals fell in 1987 (47.5’’), 1978 and 1979 (46.5’’, 45.8’’). Total average snowfall in December is 26.2’’, January is 22.6’’, February averages are slightly less at 16.9’’ and March is 18.3’’. February 14th-15th, 2007 saw the greatest 24-hour max snowfall total at 23.5’’. The snowfall totals are annual averages based on weather data collected from 1981 to 2018 for the NOAA National Climatic Data Center. From 2011 to 2018, there were four recorded “extreme” weather events in Orleans County: February 4th and 15th: Heavy Snow. January 7th and February 1, 2015: Extreme Cold/Wind Chill. While Coventry felt these events, there were not the worst the town has seen.

Ice Storm

Major Ice Storms occurred in January 1998 and again in January 2014. While Coventry was not affected by the ice storm of 1998, ice jams frequently back up water on Clyde River and can cause flooding. One of the problems with weather related storms is the loss of power. Power outages are frequent during storms with high winds causing the trees to fall on power lines. The North American Ice Storm of 1998 was produced by a series of surface low pressure systems between January 5 and January 10, 1998. For more than 80 hours, steady freezing rain and drizzle fell over an area of several thousand square miles of the Northeast, causing ice accumulation upwards of 2'' in some areas. Coventry received less than .5'' of ice. On December 13th, 2013, another ice storm hit portions of Orleans County, resulting in the greatest disruption of electric service since 1998 at 96 hours for some customers regionally but the greatest impact for residents in Coventry and was 16 hours on February 16th, 2013. While there is evidence that supports an increase in weather and precipitation severity, the incidence of ice storms remains fairly spaced out. The town expects to have another ice storm but unlike rain and snow events, the occurrence of a major ice storm is not expected every year (www.wrh.noaa.gov/map/?wfo=sto).

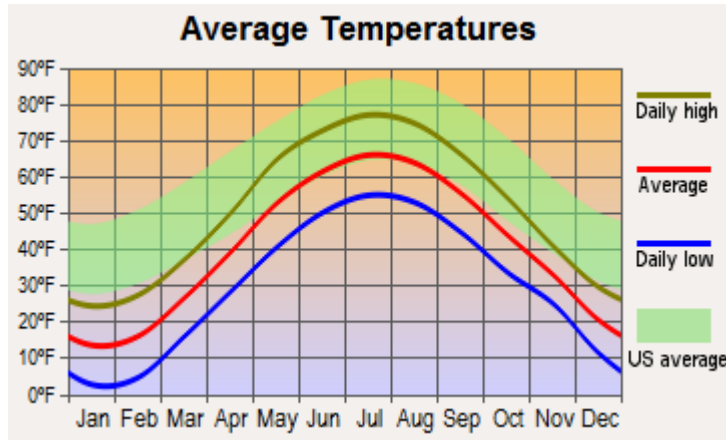
Extreme Cold

While there is no historical evidence to support a concern over the consequences of extremely hot temperatures on human health and safety, high temperatures can help to create severe storms as the one evidenced on September 11th, 2013, where record heat helped to produce damaging hail and winds in parts of the NEK and other areas of Vermont and NY. Recent extremes in cold temperatures is a concern and impact the entire city and region. 2015 tied the coldest winter (January to March) on record (1923) for Vermont as a whole according to the NOAA's National Climatic Data Center whose dataset dates to 1895. The National Weather Service has the following, recent, temperature records for nearby Newport City are:

- Highest: 95 degrees, August 2001
- Lowest: -38 degrees, February 1933

Cold temperatures are expected in the Northeast, but they can pose a serious threat to health and safety, especially as the severity and duration increases in conjunction with other technological (e.g. power outage, fuel oil delivery disruption) and societal (ability to purchase heating fuel) factors. The winter of 2015 was the coldest anyone could remember with a mean temperature of 7.8 degrees Fahrenheit. However, the January of 1994 had a mean temperature of 2.7 degrees Fahrenheit which is the coldest mean temperature since 1930 and January is the statistically coldest month in all of Vermont. Since 1930, January produced temperatures in the negative 20's and 30's consistently for Orleans County with record cold temperatures occurring in 1957 and 1933 (-38). While the temperatures for the town remain within averages seen in the last 85 years, dangerously cold temperatures are expected every winter. There is no evidence to support concern over increases in high temperatures for the town as it relates to health and human safety at this time.

Table 2-4: Coventry Temperature Ranges vs. National Average



Flooding

For Coventry, the majority of flood risk comes from the rise of the Barton and Black Rivers. Flooding is the most common recurring hazard event in the state of Vermont. June 2015 broke records across the state for the wettest on record. The area received 7 to 8 inches of rain in June but flooding did not result. Recent history, including the flooding events of 2011 and the records set in 2015 suggest that increases in total rain fall and severity are to be expected along the lines seen with the records set across the state recently. There are three sources of historical precipitation data for Vermont. The data are reported at the county level: 1) recurrence time intervals for 24-hour rainfall storm depth, 2) annualized daily frequency of rainfall, and 3) rainfall-intensity frequencies. The first source of data is the recurrence time intervals for 24-hour rainfall storm depth. The recurrence depth data describes the expected intensity of major rainfall events with respect to both rainfall depth and frequency of occurrence.

Table 2-5: 24-Hour Rainfall Depths (inches) for Common Recurrence Intervals (ANR, 2002)

County: Orleans
1-yr, 24-hr Rainfall Depth: 2.1''
2-yr, 24-hr Rainfall Depth: 2.2''
10-yr, 24-hr Rainfall Depth: 3.1''
100-yr, 24-hr Rainfall Depth: 5.0''

The second source of data are the annualized daily frequencies of rainfall, which were obtained from the National Climatic Data Center (NCDC), Climate Normals program for 1981–2018. The data provides the average number of days per year with measurable precipitation (greater than 0.01 inches) on a county by county basis. This data allows for the conversion of the annual probabilities derived from the recurrence time intervals to daily probabilities. The annualized

estimated daily frequency of measurable rainfall for Orleans County is 174 days (highest in the state) with 119 days of rain and 55 days of snow. The final source of data are rainfall-intensity frequencies. Hourly precipitation totals throughout the state of Vermont were obtained from the NCDC's Cooperative Observer Program (COOP). Hourly rainfall data were available for 26 COOP locations between 1962 through 2012. Each station is associated with the specific county in which it was located, and the hourly precipitation totals for each station are aggregated by county to yield a frequency distribution of hourly rainfall intensities.

Table: 2-6: Orleans County Rainfall-Intensity Range (in. /hr.)

County: Orleans
$x \leq 0.01$: 22.5%
$0.01 < x \leq 0.05$: 25.6%
$0.05 < x \leq 0.10$: 38%
$0.10 < x \leq 0.15$: 3.2%
$0.15 < x \leq 0.20$: 5.9%
$0.2 < x \leq 0.25$: .8%
$0.25 < x$: 4.7%

In addition to the disaster events listed in this update, there have been 11 events on Orleans County since 2011: 6 Flash Floods; 5 Floods. However, Coventry was not affected by these events (Source NOAA).

Flood Vulnerability

All of the planning area has the potential to be affected by flooding. Although, comparatively, the town has remained insulated from the catastrophic flood damage that the state has seen in the last ten years, the community continues to have concerns about impacts of future flooding. Data obtained from the SHEL DUS Spatial Hazards Events & Losses Database maintained by the University of South Carolina catalogs flooding events over approximately the past 10 years and reports 19 events in the county. Financially, damage to town bridges poses the greatest threat.

Flooding is the most common recurring hazard event in the state of Vermont. There are three main types of flooding that occur in Vermont: flooding from rain or snow melt, flash flooding and urban flooding. Flooding has also been known to occur as a result of ice jams in rivers adjoining developed towns and cities. These events may result in widespread damage in major river floodplains or localized flash flooding caused by unusually large rainstorms over a small area. The effects of all types of events can be worsened by ice or debris dams and the failure of infrastructure (especially culverts), private and/or beaver dams. Rain storms are the cause of most flooding in town. Winter and spring thaws, occasionally exacerbated by ice jams, are another significant source of flooding, especially when coupled with high rain levels. Much of this flooding is flash flooding, occurring within hours of a rainstorm or other event. Flash flooding, as opposed to flooding with a gradual onset, causes the largest amount of damage to property and infrastructure. Floods cause two major types of damage: water damage from inundation and erosion damage to property and infrastructure. The *2013 Vermont State All-Hazards Mitigation Plan* discusses flooding extensively. While that plan is concerned with all of Vermont, the information on flooding is all relevant in that:

“Recent studies have shown that most flooding in Vermont occurs in upland streams and road drainage systems that fail to handle the amount of water they receive. Due to steep gradients, flooding may inundate these areas severely, but only briefly. Flooding in these areas generally has enough force to cause erosion capable of destroying roads and collapsing buildings. These areas are often not mapped as being flood prone and property owners in these areas typically do not have flood insurance (DHCA, 1998). Furthermore, precipitation trend analysis suggests that intense local storms are occurring more frequently. Additionally, irresponsible land use and development will exacerbate the preexisting vulnerability. Urban flooding usually occurs when drainage systems are overwhelmed and damages homes and businesses. This flooding happens in all urban areas, but specifically in Burlington where the area is located at the bottom of a gradient, which adds to the intensity of this localized flooding...

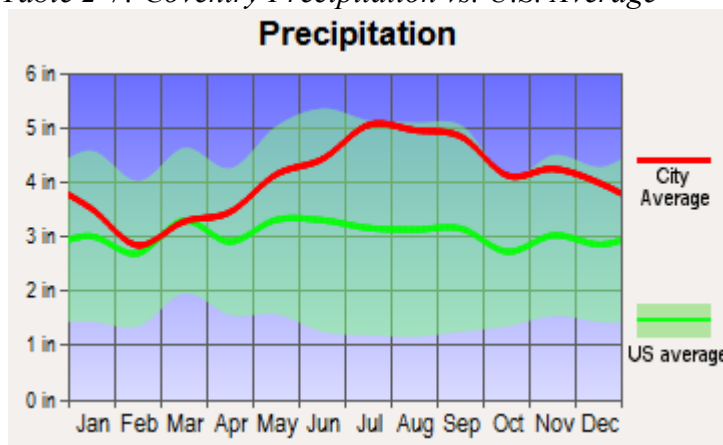
...Over the past two decades, flood damage costs have risen dramatically in Vermont due to increasing occurrences of flooding and increases in vulnerability associated with unwise land use development in flood plains or within stream corridors. The geography and topography are right for a significant localized storm with extreme damage at almost any location in Vermont. Heavy rains with previous ground saturation, which causes runoff, are a significant part of the flooding formula in Vermont. Steep topography and narrow, inhabited, stream and river valleys further increase the dangerous nature of this hazard. Furthermore, precipitation trend analysis suggests that intense, localized storms that can cause flash flooding are occurring with greater frequency. While flooding will continue, planning and other mitigation measures can help minimize damages.

All of Vermont’s major rivers have inhabited flood plains. While residents in mountain valleys are at risk, they may not be aware of the danger or may choose to ignore it. There are many reasons property owners are reluctant to relocate to less flood prone ground, not the least of which is the lack of personal experience of flooding. In addition, many communities originated beside rivers and streams; some of the most attractive property is located in vulnerable areas. Lakeshore property in Vermont is vulnerable to flooding from high water levels, either by surface water erosion or flooding. Occasionally, water-saturated ground and high-water tables cause flooding to basements and other low-lying areas. Lakeshore property is highly desirable and valuable, making the development of lakeshore areas very likely, even with the high potential for flooding. Restrictions on lakeshore property development have significant negative economic and tax revenue impacts that must be carefully weighed against the gains in personal safety and protection of property.”

Vermont experienced major floods long before Federal disaster assistance became available. The most destructive recorded event was in November of 1927. In the month before the flood, rains in excess of 150% of normal precipitation fell after the ground had frozen. The flood itself was precipitated by 10 inches of rain falling over the course of a few days. The flood inundated parts of many towns and damaged or destroyed numerous bridges in the county. As the history of the flooding cited above bears out, the geography and topography are right for a significant localized storm with extreme damage at almost any location in Vermont. Numerous floods have resulted in Presidentially-declared disasters and an influx of Federal disaster assistance. Of these disasters, 1973 flood inflicted widespread damage across the state and the residual rains of Hurricane Belle in 1976 resulted in substantial federal disaster assistance in Vermont. The

greatest 24-hour rainfall record for nearby Newport City occurred in late August 2011 at 4.01”. The greatest level of precipitation in any month occurred in August 2011 at 11.12”. Previous experiences have proven to the town that flooding is the greatest risk and another flood event is probable by the time this plan requires an update. With this conviction, the need to complete viable mitigation actions to town infrastructure becomes incredibly important and the town remains aware of this. The estimated Capacity-Disruption Levels Given a Measured Rainfall Event can be interpreted as the conditional probability that a particular roadway capacity disruption occurs, given that a rainfall event occurs. For Orleans County, the probability that the intensity of a rain event will result in approximately a 2%, 7.5%, or 13.5% roadway capacity reduction are 7.35%, 23.96%, or 1.3%, respectively (Source: *A Risk-Based Flood-Planning Strategy for Vermont’s Roadway Network, 2015*).

Table 2-7: Coventry Precipitation vs. U.S. Average



Inundation and Floodplains

Areas along the banks of the Barton River, the Black River (which flows through the Village of Coventry), Stony Brook, Day Brook, Alder Brook and Trout Brook, have been identified as Flood Plain areas. Regarding flood inundation issues, the 2013 *Vermont State All-Hazards Mitigation Plan* states:

“While inundation-related flood loss is a significant component of flood disasters, the predominant mode of damage is associated with the dynamic, and often catastrophic, physical adjustment of stream channel dimensions and location during storm events due to bed and bank erosion, debris and ice jams, structural failures, flow diversion, or flow modification by man-made structures. Channel adjustments with devastating consequences have frequently been documented wherein such adjustments are linked to historic channel management activities, flood plain encroachments, adjacent land use practices and/or changes in watershed hydrology associated with conversion of land cover and drainage activities. The 100-year, or “base” floodplain is the national standard for floodplain management. The area is shown on City Flood Insurance Rate Maps (FIRMs) as issued by FEMA. The 100-year floodplain has one chance in a hundred of being flooded in any given year. The probability that a 100-year flood will occur is a statistical determination based on past flooding in an area. This is not to say that a flood of such magnitude cannot occur two years in a row or twice in the same year. The term

only means that in any given year, the odds are 1% that the area will be flooded. The same logic holds true for defining a 500- year flood. In this case, a flood of the 500-year magnitude has a 0.2% chance of occurring in a year. Much flood damage in Vermont occurs along upland streams, damaging private property and infrastructure such as bridges, roads, and culverts. The failure of beaver dams, private ponds and public and private culvert crossings contributes to flood surges and often dramatically increased damage downstream. Homes and other private investments along these streams are generally not recognized as a flood area on FEMA maps of flood hazard zones and, thus, are not typically identified as being vulnerable to flooding or erosion. City plans and zoning regulations have generally not identified these stream corridors as areas needing protective setbacks for development or zoning.”

Fluvial Erosion

Erosion occurs on a consistent, but small-scale, basis within the riparian corridor of the town’s streams and rivers. This is a part of normal natural processes and as such is necessary for the proper functioning of the ecosystem of these waterways. However, fluvial erosion on a large scale can damage stream banks and undercut infrastructure such as roads, bridges and culverts as well as agricultural land and structures, causing severe damage. Fluvial erosion on a large scale can cause stream bank collapses, which are generally classified as landslides. Most flood damage is associated with fluvial erosion rather than inundation. The 2013 *Vermont State All-Hazards Mitigation Plan* contains the following discussion of fluvial erosion:

“Vermont’s landscape has historically contributed greatly to the widespread practice of the channelization of rivers and streams in order to maximize agricultural land uses and facilitate the development of transportation infrastructure. Channelization, in combination with widespread flood plain encroachment, has contributed significantly to the disconnection of as much as 70% of Vermont’s streams from their flood plains. In this unsustainable condition and when energized by flood events, catastrophic adjustments of the channel frequently occur, usually with consequent fluvial erosion damage to adjacent or nearby human investments. All areas of the state suffer equally from fluvial erosion hazards. Some areas have suffered more than others simply because of the location of storm tracks. Transportation infrastructure and agricultural property are the most frequently endangered types of human investment affected by fluvial erosion hazards. Residential, commercial and other municipal properties are also frequently endangered. Changes in watershed hydrology that significantly influence fluvial stability are commonly associated with urbanization or with silvicultural practices. However, watershed scale hydrologic changes have been observed in Vermont as a localized phenomenon either in small, highly urbanized watersheds or in small, rural sub watersheds where clear cutting of a large percentage of the watershed land area has recently occurred. Stream geomorphic assessments and a fluvial geomorphic database maintained by the Agency of Natural Resources have identified main stem rivers typically channelized from 60-95% of their lengths. When human investments and land use expectations include all the land in the valley up to the river banks, there results extreme public interest in maintaining this unsustainable morphological condition despite its great cost and resultant hazard to public safety.”

The Vermont Agency of Transportation (VTrans) applies the term “scour critical” to stream crossing structures especially vulnerable to streambed scour—the undermining of bridge supports by water action and erosion. A spreadsheet database is maintained by VTrans and continually updated by the Bridge Inspection Program. Structures inspected are only those of 20 ft. or longer owned by a municipality or the state. The scour critical rating is based on the structure itself, and does not consider debris jams, outflanking, channel change, or other issues commonly associated with fluvial erosion. Water supply source and distribution systems are also endangered by fluvial erosion. Many water distribution systems involve buried pipes that cross streams, which are vulnerable to fluvial erosion. In December 2014, the Vermont Department of Environmental Conservation (DEC) released the “Flood Hazard Area and River Corridor Protection Procedures” guide, outlining specific actions and considerations. Erosion of stream banks was a concern but is less-so now. A FEMA study has shown very little increase in velocities resulting from over-bank events which are infrequent and have subsequently not caused channel migration.

Ice Jams

Ice jams, which can cause rapid and catastrophic flooding, are considered increasingly hazardous in parts of Vermont. In addition to the inundation damage they cause, ice jams can block infrastructure such as roads and culverts. Ice jams are not as much of a concern in Newport as elsewhere in Vermont. A list of historic ice jams, including municipalities and streams, is maintained by the Vermont Division of Emergency Management and the Vermont Agency of Natural Resources. There has been some damage and minor flooding as a consequence of ice jams in the past. Ice jams are not as much of a concern in town as elsewhere in Vermont. A list of historic ice jams, including municipalities and streams, is maintained by VEM and the Vermont Agency of Natural Resources (ANR). The US Army Corps of Engineers Cold Regions Research and Engineering Laboratory maintains a more specific database of ice jams, which includes over 903 events in Vermont with the latest occurring in 2013. The Clyde River has had two recorded ice jams. The Clyde jams can and have impacted a corner of town. Other NEK areas have high rankings. Passumpsic had 19 (10th highest in the state) and St. Johnsbury had 38 (5th highest in the state) with the Connecticut River being number one in the state with 84 recorded ice jams and the Passumpsic River with only one. On a positive note, the total number of events has been decreasing since 2004.

(Source: http://rsgisias.crrel.usace.army.mil/apex/f?p=524:39:10954063060296::NO::P39_STATE:VT)

Dams

According to the 2013 *Vermont State All-Hazards Mitigation Plan*, “The VT Agency of Natural Resources (ANR) Dam Safety Program maintains an inventory of 1205 dams (including 85 ANR owned dams) with impoundments greater than 500,000 cubic feet”. Failure of any of these dams could result in significant downstream flooding. A dam breach is remains the biggest threat to the municipal sewer system. There have been no recent or historically relevant flooding events associated with the failure of any dam in *Vermont*. However, as stated in FEMA Guide P-956 “Living with Dams: Know Your Risks” (2013): “Although dam failures are infrequent, the impacts can be catastrophic, often far exceeding typical stream or river flood events.” Coventry Village are serviced by a system owned and maintained by the Coventry Fire District. This system includes: a gravel-packed well, a pump rated at 65 gpm, a chemical

control room; a 100,000-gallon concrete storage reservoir; and a number of 2", 4" and 6" transmission lines and distribution mains. The system serves homes along Town Roads 7, 36, and 54. Due, in part, to scattered development trends, and the adverse economic impact, Coventry has no current plans to develop a town wide water system

SECTION 3: RISK ASSESSMENT

3.1 Designated Hazard Areas

3.1.1. Flood Hazard Areas

All of Orleans County is located in the Barton River watershed, a drainage area of approximately 164 square miles. Areas along the banks of the Barton River, the Black River (which flows through the Village of Coventry), Stony Brook, Day Brook, Alder Brook and Trout Brook, have been identified as Flood Plain areas. There are five properties in the A-zone, six policies with a total coverage of \$475,900. There has been one claim since 1978 for \$133,944. *Source: NFIP Insurance Report/Town Maps*

3.1.2. Fluvial Erosion Hazard Areas

About two-thirds of Vermont’s flood-related losses occur outside of mapped floodplains, and this reveals the fundamental limitations of the FEMA FIRMs. A mapped floodplain makes the dangerous assumption that the river channel is static, that the river bends will never shift up or down valley, that the river channel will never move laterally, or that river beds will never scour down or build up. River channels are constantly undergoing some physical adjustment process. This might be gradual, resulting in gradual stream bank erosion or sediment deposit – or it might be sudden and dramatic, resulting a stream bank collapse. The losses experienced during the May 2011 storms and Tropical Storm Irene were most often related to the latter. In fact, this type of flood-related damage occurs frequently in Vermont, due in part to the state’s mountainous terrain. Land near stream banks are particularly vulnerable to erosion damage by flash flooding, bank collapse, and stream channel dynamics. The Vermont Department of Environmental Conservation, Agency of Natural Resources, has identified river corridors, which consist of the minimum area adjacent to a river that is required to accommodate the dimensions, slope, planform, and buffer of the naturally stable channel and that is necessary for the natural maintenance or natural restoration of a dynamic equilibrium condition. In other words, the river corridor provides “wobble room” for a stream as its channel changes over time. Keeping development out of the river corridors therefore reduces vulnerability to erosion.

Table 3-1: Repetitive Loss Properties

Area/Type	Repetitive Losses	BCX Claims	Polices	LOMCS	FIRM
Coventry Town/all residential	0	0	6	3	9/27/85

Resource: FEMA Repetitive Loss/BCX Claims. NOTE: BCX claims are ones located out of the SFHA.

3.2 Non-designated Hazard Areas

3.2.1. Ice Storm Damage

On December 13th, 2013, another ice storm hit portions of Orleans County, resulting in the greatest disruption of electric service since 1998. While there is evidence that supports an increase in weather and precipitation severity, the incidence of ice storms remains fairly spaced out. The town expects to have another ice storm but unlike rain and snow events, the occurrence of a major ice storm is not expected every year. (1998 data: <https://www.fema.gov/disaster/1201>)

3.2.2. High Winds and Lightning

Ridgeline and hilltop homes as well as homes located in the midst of mature forests are the most vulnerable to damage from falling trees and tree limbs. High tension lines are maintained very well by the electric service providers and the Vermont Agency of Transportation works to keep limbs trimmed on state highways. As with many Vermont communities characterized by natural terrain, the issue of downed trees creating power loss and property damage is more common compared to urban areas. Historically, these instances are short in duration and have not posed a serious risk for the town or its residents.

3.3 Previous FEMA-Declared Natural Disasters and Non-Declared Disasters

While Coventry has had a history of flooding, losses to public infrastructure have intensified in recent years. The summer of 2002 resulted in the greatest financial impact to infrastructure, namely destruction of a bridge. The town has been fortunate that its buildings and residential property has remained unaffected by recent disasters. Coventry and its Villages have received public assistance funding from FEMA for the following natural disasters:

Table 3-1: KEY:

DR	Date	Type
1307	11/10/1999	TS Floyd
1428	07/12/2002	Severe Storm(s)
1559	9/23/2004	Severe Storms, and Flooding
1995	06/15/2011	Severe Storm(s)
3167	04/10/2001	Snow
4022	09/01/2011	Hurricane
4140	08/02/2013	Severe Storm(s)
4066	06/22/2012	Severe Storms, Tornado and Flooding
4163	01/29/2014	Severe Winter Storm
4178	06/11/2014	Severe Storm/Flooding

4207	02/03/2015	Severe Winter Storm
4380	06/30/2018	Severe Storm/Flooding
4356	01/02/2018	Severe Storm/Flooding

Table 1-2: Public Assistance Summary: 2005-Current:

Disaster Number	PW #	Application Title	Applicant ID	Damage Category Code	Project Amount	Federal Share Obligated	Total Obligated
3167	21	EMERGENCY PROTECTIVE MEASURES (SNOW REMOVAL ASSISTANCE)	019-03550-00	B - Protective Measures	\$0.00	\$0.00	\$16.07
3167	30	EMERGENCY PROTECTIVE MEASURES (SNOW REMOVAL ASSISTANCE)	019-03475-00	B - Protective Measures	\$2,060.96	\$1,545.72	\$1,639.70
3167	128	EMERGENCY PROTECTIVE MEASURES (SNOW REMOVAL ASSISTANCE)	019-03550-00	B - Protective Measures	\$6,695.11	\$5,021.33	\$5,326.63
4022	19	NCORLBAR roaring brook 1	019-03550-00	C - Roads & Bridges	\$4,800.00	\$4,320.00	\$4,320.00
4022	20	NCORLBAR roaring brook 3	019-03550-00	C - Roads & Bridges	\$1,000.00	\$900.00	\$900.00
4022	21	NCORLBAR roaring brook 2	019-03550-00	C - Roads & Bridges	\$1,200.00	\$1,080.00	\$1,080.00
4022	634	NCBAcatC1 roaring brook	019-U5H52-00	C - Roads & Bridges	\$9,633.35	\$8,670.01	\$8,670.01
4022	641	NCBAcatC2 lake street	019-U5H52-00	C - Roads & Bridges	\$4,320.15	\$3,888.13	\$3,888.13
4022	750	NCBAcatF03 electric utility	019-U5H52-00	B - Protective Measures	\$1,571.70	\$1,414.54	\$1,414.54
4022	839	NCBAcatF04 pine crest utility pole	019-U5H52-00	F - Public Utilities	\$2,269.50	\$2,042.56	\$2,042.56
4066	1	JCBAC1 - Stevens Road	019-03550-00	C - Roads & Bridges	\$4,973.77	\$3,730.33	\$3,730.33
4140	25	RMBTC01 TH 48 and TH 2	019-03550-00	C - Roads & Bridges	\$27,083.05	\$20,312.29	\$20,312.29
4140	183	Duck Pond Rd (VAOT undesignated) Emergency Protective M	019-U5H52-00	B - Protective Measures	\$2,855.25	\$2,141.44	\$2,141.44
4140	184	Duck Pond Rd (VAOT undesignated) Lake St (TH #1) Debris	019-U5H52-00	A - Debris Removal	\$2,722.95	\$2,042.21	\$2,042.21
4140	187	Duck Pond Rd (VAOT	019-	C - Roads	\$49,348.96	\$37,011.72	\$37,011.72

		undesignated)	U5H52-00	& Bridges			
4163	21	BARTA01 Townwide Debris Pickup	019-03550-00	A - Debris Removal	\$12,639.57	\$9,479.68	\$9,479.68
4163	35	BARVF01 Coventry Village	019-U5H52-00	F - Public Utilities	\$48,841.98	\$36,631.49	\$36,631.49
1307	37	DEBRIS REMOVAL	019-03550-00	A - Debris Removal	\$5,991.02	\$4,493.27	\$4,766.46
1428	1	ROADS AND BRIDGES	019-03550-00	C - Roads & Bridges	\$282,886.05	\$212,164.54	\$221,244.84
1428	2	ROAD AND CULVERT REPAIR	019-03550-00	C - Roads & Bridges	\$22,550.00	\$16,912.50	\$17,940.78
1428	3	ROAD REPAIR	019-03550-00	C - Roads & Bridges	\$3,870.00	\$2,902.50	\$3,109.16
1428	87	BRIDGE REPAIR	019-03475-00	C - Roads & Bridges	\$44,634.12	\$33,475.60	\$35,349.95
1428	141	WASTE-WATER TREATMENT PLANT	019-U3KEZ-00	F - Public Utilities	\$2,342.36	\$1,756.77	\$1,863.59
1559	169	RETAINING WALL REPAIR	019-03550-00	C - Roads & Bridges	\$19,800.00	\$14,850.00	\$15,752.88
1995	296	NCORL BAR leblanc	019-03550-00	C - Roads & Bridges	\$4,765.51	\$3,574.13	\$3,574.13
1995	297	NCORL BAR baird	019-03550-00	C - Roads & Bridges	\$3,513.54	\$2,635.16	\$2,635.16
1995	300	NCORL BAR lake region	019-03550-00	C - Roads & Bridges	\$4,520.26	\$3,390.20	\$3,390.20
1995	301	NCORL BAR hollow	019-03550-00	C - Roads & Bridges	\$12,558.22	\$9,418.67	\$9,418.67
1995	356	NCORL BAR office	019-03550-00	E - Public Buildings	\$500.00	\$375.00	\$375.00
4163	33	OEDF1 Orleans Electrical Dept.	019-53575-00	F - Public Utilities	\$51,751.39	\$38,813.54	\$38,813.54

Sources: FEMA Opensource

Non-declared disasters (e.g. snow and rain storms) have not resulted in damage above and beyond normal maintenance. Extreme, long-lasting cold temperatures during winter months do pose a concern for the town as in many communities where the price of heating fuel often exceeds resident's ability to pay. Coupled with high unemployment, there is an increased risk for the town's residents to not meet the financial requirements for adequate heat, especially during long periods of extremely cold temperatures. Without adequate provisions, 48 hours of extremely cold temperatures could create a serious health hazard.

3.3 Hazard Assessment and Risk Analysis

Although estimating the risk of future events is far from an exact science, the Planning Team used best available data and best professional judgment to conduct an updated Hazards Risk Estimate analysis. This analysis assigns numerical values to a hazard's affected area, expected consequences, and probability and supports the inclusion of all profiled hazards in this plan. This quantification allows direct comparison of very different kinds of hazards and their effect on the town and serves as a method of identifying which hazards hold the greatest risk based on prior experience and best available data. While there are some differences in risk associated with each jurisdiction, there is a single estimation matrix and when appropriate, subsequent narratives will describe the differences in risk. The following scoring system was used in this assessment:

Area Impacted: scored from 0-4, rates how much of the municipality's developed area would be impacted.

Consequences: consists of the sum of estimated damages or severity for four items, each of which are scored on a scale of 0-3:

- Health and Safety Consequences
- Property Damage
- Environmental Damage
- Economic Disruption

Probability of Occurrence: (scored 1-5) estimates an anticipated frequency of occurrence based on prior experience and current information.

To arrive at the Overall Risk Value, the sum of the Area and Consequence ratings was multiplied by the Probability rating. The highest possible risk score is 80.

3.3.1. Natural Hazards

According to the updated Hazard and Risk Estimation for Coventry, the following natural hazards received the highest risk ratings out of a possible high score of 80:

- Severe Winter/Ice Storm (listed as "Winter Storm" in table) (32)
- Flooding (36)
- Extreme Cold (32)
- Hazardous Materials Incident (16)

Flood-related disasters have had the greatest financial impact on the town. While no deaths or injuries have been recorded for declared or non-declared disasters, the potential for health and safety risk during a severe winter storm and extreme cold events are considered higher than that posed by a flooding event. The landfill is a repository for solid waste collected state-wide and this equates to constant waste transportation." Additional risk comes from having an airport and the risk for a larger than moderate hazardous materials incident is evident given the dynamics of the town.

Table 3-2 Natural hazards risk estimation matrix

Coventry Hazard & Risk Analysis: NATURAL HAZARDS		Drought	Flooding	High Winds	Fluvial Erosion	Landslide	Lightning	Multi-Structure Urban Fire	Hazardous Materials Incident	Winter Storm	Extreme Cold
Area Impacted											
Key: 0 = No developed area impacted											
1 = Less than 25% of developed area impacted											
2 = Less than 50% of developed area impacted											
3 = Less than 75% of developed area impacted											
4 = Over 75% of developed area impacted		1	3	2	1	0	1	1	1	4	4
Consequences											
Health & Safety Consequences											
Key: 0 = No health and safety impact											
1 = Few injuries or illnesses											
2 = Few fatalities or illnesses											
3 = Numerous fatalities		0	1	0	0	0	1	1	2	1	1
Property Damage											
Key: 0 = No property damage											
1 = Few properties destroyed or damaged											
2 = Few destroyed but many damaged											
3 = Few damaged but many destroyed											
4 = Many properties destroyed and damaged		0	1	1	1	0	1	2	1	1	1
Environmental Damage											
Key: 0 = Little or no environmental damage											
1 = Resources damaged with short-term recovery											
2 = Resources damaged with long-term recovery											
3 = Resource damaged beyond recovery		2	2	1	1	2	0	1	2	0	0
Economic Disruption											
Key: 0 = No economic impact											
1 = Low direct and/or indirect costs											
2 = High direct and low indirect costs											
2 = Low direct and high indirect costs											
3 = High direct and high indirect costs		2	2	1	2	1	1	1	2	2	2
Sum of Area & Consequence Scores		5	9	5	5	3	4	6	8	8	8
Probability of Occurrence											
Key: 1 = Unknown but rare occurrence											
2 = Unknown but anticipate an occurrence											
3 = 100 years or less occurrence											
4 = 25 years or less occurrence											
5 = Once a year or more occurrence		1	4	3	3	1	2	2	2	4	4
TOTAL RISK RATING											
Total Risk Rating =		5	36	15	15	3	8	12	16	32	32
Sum of Area & Consequence Scores											
x Probability of Occurrence											

3.4 Hazard Summary

According to the risk estimation analysis, the highest rated hazards for Coventry are:

1. Flooding
2. Severe Winter Storm/Ice
3. Extreme Cold
4. Hazardous Materials Incident

It should be noted that two natural hazards on the list; severe winter storm and flooding, could be the cause of the highest-rated technological hazards: power loss and fuel supply interruption. Flooding is the highest rated hazard for Coventry due to previous damage events and subsequent costs to repair. Within each of the highest rated hazards, there exists the potential for the secondary, but no less important, consequence of increased financial demand on residents as a result of an event. While winters in Vermont are characterized by cold weather, recent increases in extreme weather events, including extremely cold temperatures increases the costs of heating energy and this is a challenge that the state and local communities are being forced to address.

SECTION 4: VULNERABILITY ASSESSMENT AND LAND USE

Vulnerability refers to the potential impact of a specific loss related to an identified risk. While the loss of any one facility would cause a disruption in town services and operations, the overall vulnerability is low. There are roads, bridges and culverts vulnerable to flooding and those are identified below. Loss of equipment function for the highway department is a vulnerability for the town but the risk is not due or predicted to be a result of a disaster, merely, the required maintenance expected of highway-related machinery. For this section of the plan, the planning team looked at prior history and worst-case scenarios. All three jurisdictions have, essentially, the same vulnerability with two main exceptions: 1; The Villages are more vulnerable to hazardous materials incident due to location of the facility/chemical storage and 2; Coventry Town is more vulnerable to road erosion and wash-outs because of its higher percentage of dirt roads (the Villages are nearly 100% paved). These differences will be further addressed in this section and Section 5. Despite any minor variance in vulnerabilities in the three jurisdictions, the primary vulnerability for the three jurisdictions is transportation-related infrastructure damage due to flooding.

Of the profiled hazards, the following vulnerability rating (high, moderate, low) is given below. This vulnerability rating is based on the disaster case history for the town and when the greatest financial impact was seen due to the disaster. The specific vulnerability to the population as a whole or any specific sub-population (e.g. elderly) is subjective because there is no historical data to rank vulnerability to health and safety of residents, workers or travelers.

Severe winter/ice storm: Moderate

Summary: While all structures are vulnerable to major snow loads, there is little evidence to support concern over structure failure due to snow loads on roofs, ice on gutters, etc. Town snow removal equipment is vulnerable to damage with greater use, especially during emergency situations as well as road damage from plowing. Populations caught outdoors, commuting or working outside during a severe winter storm are more vulnerable to cold-related injury and/or snow related accidents but winter comes every year and residents and the town are accustomed to making intelligent decisions regarding safety and protection of infrastructure. Special populations (e.g. aging, disabled, etc.) are more vulnerable in terms of mitigating structure loads, hazardous travel and relocating to safety.

Extreme Cold: Moderate

Summary: Recent evidence shows that greater extremes in temperature and overall weather fluctuation are occurring with increased frequency. A long-duration cold snap can cause significant damage to structures due to bursting pipes and the residential health and safety considerations include factors related to financial resources, fuel supply, sheltering, provisions and employment.

Flooding: High

Summary: The town is flooding and this is specific to transportation routes and infrastructure more-so than buildings and people in Coventry. However slight in terms of probability, a dam failure would have catastrophic implications on homes, buildings, people and equipment. The magnitude of financial resources devoted to flood-related damage in the town equates to high vulnerability. Flooding impacts the planning area by inundation damage to structures, which are considered well-below the FEMA flood hazard elevation and roadway drainage structures. Most of the damage is to road surfaces, drainage structures (culverts, ditching) and driveways. Roadways are also an issue for municipal road crews in each jurisdiction when they become inundated and cut off traffic.

Hazardous Materials Incident: Moderate

Summary: Route 5 remains highly utilized by landfill-related vehicles and the frequency of large vehicles on the road increases risk of an accident. Air traffic and airport-related substances, some hazardous are present in the town and increase risk of incident via accident.

Table 4-1: Vulnerability Summary Table

Hazard	Vulnerability	Extent (Storm Data from most severe event)	Impact (economic/health and safety consequence)	Probability
Flood	<p>Culverts, bridges, road infrastructure.</p> <p>0 critical or public infrastructure in SFHA/.2% FHA</p>	<p>The greatest 24-hour rainfall record for immediate region occurred in late August 2011 at 4.0". The greatest level of precipitation in any month occurred in August 2011 at 11" No detailed data was available for fluvial erosion damage in town in terms of numbers of acres lost during each event.</p>	<p>DR 1428 (7/2002) resulted in greatest financial impact and damage to roads and bridges with over \$222,000 in total project costs. No extent data as available for this event</p>	High
Extreme Cold/ Snow/Ice Storm	<p>The entire Town is vulnerable, including road infrastructure, town and privately-owned buildings, utility infrastructure</p>	<p>Snowfall has varied, from a few inches to over a foot or more. Heavy snow and wind may down trees and power lines. Snow/ice contributes to hazardous driving conditions.</p>	<p>For roof collapse: monetary damages will depend on each structure but, collapse of barn roof is often a total loss. This does not include the loss of livestock. Collapse of a house roof may be at a 50% loss. For car crashes due to poor driving conditions: minimal damage to vehicle to totaled vehicle and operator injury. Health impacts could vary significantly. Loss of energy or communication capabilities may occur and impede recovery.</p>	High

Hazardous Materials Incident	Facilities, residential structures and people within proximity of event (dependent on characteristic and state of chemical).	Aircraft-related accident and waste transportation frequency and substance pose risk	Any chemical spill can be hazardous but given prior event, mass fatalities is a possible consequence.	Moderate
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4.1 Water, Wastewater and Electric Power Service

Current Fire District Water System: There are 60 connections, including 2 churches, 2 apartment buildings, one of which is a Senior Housing facility under the ownership of Rural Edge, the Coventry Village School, 6 commercial and Town buildings. Through those connections, water is consumed by 100 children and 30 staff at the Coventry Village School, the 6300 individuals who belong to civic and community groups who use the Community Center. Additionally, 120 to 130 patrons eat at Martha’s Diner daily. Water rents are paid by users on a quarterly basis and are fund the total operating costs of the Fire District. From this service, there is a monthly revenue of approximately \$3,000.00 Anticipated expenses are budgeted for \$42,000.00. If something happened to compromise the water system, depending on severity, the ability to distribute water for about 7 days exists. If there was failure at the booster pump station, the generator could supply water to affected customers (6). Currently being constructed is the arsenic treatment facility which is costing about 850,000.00. To replace the reservoir would cost about 250,000.00, the booster pump building about 19,000.00. If there was no ability to provide water, the town (fire district) would have to find a viable solution to provide about 10,000 gallons a day.

Town assets include a gravel packed well located on a 2.5-acre parcel of land off Hermanville Road and near the Black River between the Upper and Lower Falls, a 110,000 gallon storage tank and chemical feed building located near Hermanville Road, and nearby, a 1.8 acre parcel. Additionally, there is a booster pump station that services the Coventry Heights area located near the Coventry Village School.

In September 2016 the State of Vermont notified the Fire District that it had exceeded the Maximum Contaminant Level for Arsenic, a violation of the Federal Safe Drinking Water Act. A Public Notice was issued to users recommending that water not be used for drinking or cooking. The Fire District was charged with submitting a plan to reduce the level below the Maximum Contaminant Level. The State Drinking Water and Groundwater Protection Division has approved our plan and a pilot project utilizing the planned method of arsenic removal was successful. A successful bond vote occurred in March. Final design plans are being completed. Additionally, there will be some system wide improvements that will replace a section of water

main and improve the esthetic quality of water decreasing, along with the arsenic, iron and manganese. (2018 Town Plan)

4.2 Estimating Potential Losses in Designated Hazard Areas

With 5 structures, including portions of town roads and bridges within the 100-year floodplain, there are only a total of 0 repetitive loss properties in town. The town and villages do not believe that even during a flooding event similar to the worst experienced in the last 20 years that there would be substantial damage to buildings or residential housing that exceeded 1%. However, given the magnitude of damage to town bridges, the potential for costs exceeding \$300,000 dollars to repair exists because it has happened in the last 20 years. However, the repairs and upgraded resilience of these locations associated with these prior expenses greatly reduces the potential for a recurrence and the disaster funding history supports the fact that the town and villages have not had to spend nearly as much on repairs following a declared disaster compared to many other towns in the region.

4.3 Proposed Land Use and Development Trends Related to Mitigation

The majority of Coventry's future development should occur along or west of the Airport Road as much of that area east of the Airport Road is either wetland or has limited access. From Route 5 to the airport is a state highway, while the road beyond the airport is a town road. Commercial land uses should be encouraged in the Village area but not in the floodplain. Commercial/industrial uses already exist along Route 14 and Airport Road. These areas would be suited for additional uses of a similar nature. The area surrounding the Pike plant and the gravel pit on Route 14 would seem to be the best place to locate heavy industrial land uses that require trucking as Route 14 is already a truck route. Airport Road would be a better location for lighter industrial / commercial uses that would need to locate near an airport. (2018 Coventry Town Plan).

The effective flood maps are used by the town to support flood hazard area regulations and are assessed for necessary changes as part of the NFIP continued compliance. David Barlow, Zoning Administrator in the compliance officer for the town's participation in the NFIP. Since the last approved mitigation plan in 2005, the total number of residential dwellings increased from 375 to 428. This represents a smaller increase in the previous 13 years (from 267 to 375). Mobile homes account for a slightly higher percentage of single-family homes in 2017 as they did in 1980 (27.8% in 2017 compared to 26.9% in 1980). The increase in residential is not coupled with an increase in residential flood damage or flood vulnerability based on claims data and town awareness. NFIP compliance is met, in part by the following regulations:

- *“All development including fill, excavation, grading, erection or placement of structures, substantial improvement of existing structures and storage of equipment and material prescribed by the Town of Coventry are permitted within an area of special flood hazard only upon the granting of a conditional use permit by the Board of Adjustment”*
- *“All development and structures shall be:
1. Designed to minimize flood damage to the proposed development and to public facilities and utilities, and; 2. Designed to provide adequate drainage to reduce exposure to flood hazards.”*

- “No development shall occur within 50 feet of the seasonal high water-mark of any stream or river shown on the official zoning maps. If such stream or river is within a designated flood plain area.”

4.3.1. Land Use Goals

As stated in the 2018 Town Plan, it is the goal of the town to:

- To encourage and support industries, small businesses, and entrepreneurs to locate in the community
- To support the continued growth of the community and the creation of new opportunities for business growth
- To support the expansion and development of the Northeast Kingdom International Airport in a manner that will create both commercial and industrial development that will benefit the area
- To support the development and deployment of better broadband access for the community
- To ensure proper enforcement of the Town’s Flood Hazard Area Regulations so as to maintain the Town’s eligibility in the National Flood Insurance Program
- The Town is supportive of the Phase VI expansion of the landfill which is currently in the Act 250 permitting process. This expansion would extend the useful life of the landfill for approximately 20-25 years
- The Town should begin planning longer-term, especially for when the landfill reaches the end of its useful life
- The Town should pursue the purchase and development of a property on Hancock Hill to be used as a source of gravel for the Town
- Future land use planning could include a program that would stimulate diversification in the Town's approach to adding to its Grand List. Commercial and light industry could be offered incentives for moving into Coventry

4.3.2. Land Use Strategies

- This town plan encourages that future development occur in the areas of town where development has already taken place. These areas would include those that are along and west of Route 5 with more limited development to the east of Route 5.
- To work with neighboring communities in structuring the region’s future
- To promote and protect the historic character of the Village of Coventry by maintaining existing historic structures and encouraging the development that will be in harmony with existing structures. To support the development of value-added agricultural, forest, and natural resource-based enterprise(s) within the community
- To support the development of value-added agricultural, forest, and natural resource-based enterprise(s) within the community
- The Town should plan for the maintenance and support of agriculture as other types of development occur.

4.3.4 Future Development and Housing

The total number of these dwelling units (excluding seasonal residences and commercial apartments) increased from 171 in 1980 to 428 in 2017. As indicated from the data, mobile homes account for a slightly higher percentage of single-family homes in 2017 as they did in 1980 (27.8% in 2017 compared to 26.9% in 1980). However, houses on lots greater than 6 acres grew significantly as a percentage of year-round residential properties, from 19.9% in 1980 to 40.4% in 2017. The number of year-round single-family dwellings increased by 149% from 1980 to 2017, as shown in the Grand List data above. However, population increased by only 56% during this same period, as shown in the table below. This indicates a shrinking of household size over that time period. (2018 Town Plan).

SECTION 5: MITIGATION STRATEGIES

In understanding that a requirement for this update is to explain what the town has accomplished in relation to the actions identified in the 2005 plan, the town must address this requirement by explaining that the 2005 plan was approved with no listed mitigation actions. The greatest advancement in mitigation planning the town has achieved since 2005 has come from the direct experiences in responding to, and recovering from, the major disasters that have impacted the town in the last decade. These disasters, have, to a very large extent, redefined how the entire state views and addresses mitigation. The work of state agencies, including those devoted to transportation, planning and emergency management have also changed the way towns go about their day-to-day operations and planning, both in emergency situations and out. It is because of this that the town views this update as the new standard in their mitigation planning efforts. This plan allows for the systematic documentation of efforts in the next planning cycle in formats that the town will continue to use. There has not been a formula for ongoing, documented, mitigation efforts prior to this update. While the town has learned a great deal and put much of the knowledge to practice in its highway department and planning efforts, these have not come as a result of the 2005 plan. We feel that the implementation matrix captures specific progress in certain areas but more importantly, gives the town a guide from which all future action and updates can be based on.

5.1 Town Goals and Policies that support Hazard Mitigation

5.1.1. Community Goals

- a. Continue municipal service supply systems
- b. Continue the Coventry Town Foundation, (CTF).
- c. Consider implementation of special population tracking within the community where-by residents unable to drive or that have no one to depend on can self-identify for inclusion in a maintained data-base so that rescue personal and emergency managers can account for this demographic.

- d. Encourage the elimination of existing and potential pollution sources. This is important for all lakes and ponds and is of critical importance for bodies of water which serve as municipal water supply sources
- e. The Selectboard shall pursue grant funding for shelter emergency generators as-needed.
- f. Existing developed property owners in specified districts should be encouraged to eliminate existing pollution or to upgrading existing inadequate environmental facilities.

5.1.2. Capital Improvement Goals

- a. Provide services and facilities deemed necessary for the orderly and rational development of the Town.
- b. Gravel roads should be paved as traffic volumes dictate. Approval of new projects which have immediate impact on unpaved connector roads should include reasonable cost sharing between the Town and the two Villages for paving and other upgrading expense in some reasonable proportions without unduly discouraging or jeopardizing otherwise reasonable development

5.1.3. Public Participation Goals

- a. Continue to solicit input regarding planning issues from town residents and from other entities which can help to offer solutions and insight into the problems the Town faces both now and in the future via formal meetings and advertised opportunities for input.
- b. Utilize the LEPC and NVDA to increase awareness, enhance planning and engage in exercises that address needs in the community.

5.1.4. Regulatory Devices Goals

- a. State permitting and Vermont's Act 250
- b. The Town should plan a financial future that invests the current surplus of tipping fees to produce perpetual investment income for the Town.
- c. Develop and maintain a "No Adverse Impact" (NAI) approach to flood hazard management by institutionalizing the best practices set forth by the ASFPM.
- d. Utilize best practices in flood-plain management for farm-related development in town.

5.1.5. Land Use

- a. Work to develop a Flood Hazard Area Overlay District to include all designated flood hazard areas. The purpose of the Flood Hazard Area Overlay District is to (1) protect public health, safety, and welfare by preventing or minimizing hazards to life and property due to flooding, and (2) to ensure that private property owners within designated flood hazard areas are eligible for flood insurance under the National Flood Insurance Program (NFIP).
- b. All other Land Use goals are stated in the 2018 Town Plan

5.1.6 Natural Resources

- a. Ensure that the existing health ordinance is enforced to maintain protection of both surface and groundwater supplies.
- b. The town should work with the NVDA and ACCD to continue the process of identifying the Town's land conservation priorities, and to the degree possible, link them to broader regional conservation work.
- c. In line with the VTrans mission statement regarding climate change, the town remains committed to:
 - Ensure that there are viable alternative routes around vulnerable infrastructure such as bridges and roadways
 - Make safety a critical component in the development, implementation, operation and maintenance of the transportation system
 - Develop contingency plans for a wide-variety of climate impacts to be implemented as data/information becomes available
 - Utilize information technology to inform stakeholders during times of emergency
 - Educate of the public and other stakeholders on the threats posed by climate change and fluvial erosion hazards
 - Increase inspection of infrastructure if warranted by climate change indicators
 - Apply a decision-making framework to incorporate cost-benefit analyses into adaptive plans and policy
 - Work to protect essential ecosystem functions that mitigate the risks associated with climate change
 - Educate individuals within the agency to use best-practices during recovery periods to avoid ecological damage that may further exacerbate risk
 - Recognize the interconnected nature of our built environment with ecological processes
 - Protect the state's investment in its transportation system and adapting transportation infrastructure to the future impacts of climate change
- e. In line with DEC's best practices regarding fluvial erosion, the town will work to:
 - Slowing, Spreading, and Infiltrating Runoff (The State Surface Water Management Strategy is found at <http://www.watershedmanagement.vt.gov/swms.html> and <http://www.watershedmanagement.vt.gov/stormwater.htm>)
 - Avoiding and Removing Encroachments. http://www.watershedmanagement.vt.gov/rivers/htm/rv_floodhazard.htm
http://www.watershedmanagement.vt.gov/rivers/docs/rv_RiverCorridorEasementGuide.pdf
 - River and Riparian Management: DEC has prepared a compendium of *Standard River Management Principles and Practices* to support more effective flood recovery implementation; improve the practice of river management; and codify best river management practices in Vermont. The document compiles the most current river management practices based on the best available science and

engineering methods to create consistent practice and language for risk reduction while maintaining river and floodplain function. Best practices are established to address common flood damages, including:

- Erosion of banks adjacent to houses and infrastructure
- Erosion of road embankments
- Channel movement across the river corridor
- River bed down-cutting that destabilizes banks, undermines structure foundations, exposes utility crossings, and vertically disconnects rivers from adjacent floodplains
- Bridge and culvert failure

Source: http://www.watershedmanagement.vt.gov/permits/htm/pm_streamcrossing.htm

5.1.7. Policies

- a. Through both town and state-level management, the town and villages will work to:
 - Encourage and maintain naturally vegetated shorelines, buffers and setbacks for all rivers, ponds and streams
 - Reduce flood hazard and repetitive road and driveway washout through continued updates and adherence to priorities in road, bridge and culvert improvement projects
 - Identify and manage pollution, flooding and fluvial erosion hazards along rivers and streams as they arise

5.1.8. Transportation Plan

In adjunct to town-specific planning, the town is committed to continually subscribing to all current state standards related to:

- a. Maintaining safe operating conditions on the present system of town roads through design and modification to keep traffic at appropriate speeds and to assure the safest possible driving conditions, including consideration of additional paving (though only on portions of roads prone to damage) should state funding become available.
- b. Protection of existing town roads from flood damage and uncontrolled storm water runoff.
- c. Preserving the capacity of town roads and maintain adequate traffic flows and safety.
- d. Support the road maintenance crew through Town-provided training sessions. This includes ICS training along with the Road Commission (Selectboard).
- e. Support policies and procedures that ensure longevity of essential town-equipment and develop and maintain MOU's with neighboring towns related to equipment use during emergencies.
- f. Continue long term access opportunities to gravel and sand deposits for future road maintenance use.
- g. Consider developing a standard operating procedure (SOP) based on ICS principles for highway department response events were coordination, communication and support are at a heightened level.

5.1.9. Utilities and Facilities Goals

- a. Develop policies and procedure that ensures equipment longevity to the greatest extent possible.
- b. Develop a retention plan for highway department personnel to help avoid high turnover and preserve institutional memory.
- c. Achieve requirements for Village water supply in 2018 (see Town Plan)
- d. Ensure adequate provision of water sources for fire suppression by requiring dry hydrants, fire ponds, water storage, or other measures where appropriate. The Planning Commission will work with developers and property owners on this task.

5.1.9.1. Educational Goals

- a. The School Board should work with the Selectboard and the American Red Cross and Fire Department to ensure that the necessary equipment exists at the school for its use as an emergency shelter.
- b. Increase emergency planning cohesion between school and town EOPs through mutual participation and presentation at scheduled LEPC meetings and town and/or school meetings.
- c. Continue collaboration with the Vermont Chapter of the American Red Cross on their sheltering initiative program to further readiness with training and supplies related to sheltering operations.

5.2 Existing Town of Coventry Actions that Support Hazard Mitigation

The town has done an excellent job at monitoring and addressing transportation issues, engaging in a documented and systematic approach to mitigation actions. The Selectboard has successfully pursued funding to address needs. Each year the Town of Coventry receives a percentage of the tipping fees charged at the Waste USA Landfill. This percentage results in approximately \$1.2 million per year for Coventry. This relationship supports the financial component required for sustained mitigation efforts. Additional funding relationships are established and ongoing with Better Back Roads, Structures Grants and FEMA. The town has been able to enhance its resilience and overall preparedness. The town has addressed its current and future needs and by and large, road improvement projects remain the primary focus for the town and the areas identified were selected based on the condition of culverts and ditches and primarily focused on runoff issues particularly as the incidence of heavy storms has increased. In many cases, culverts properly sized for normal rain events are overwhelmed by the severe ones. The town will seek local, state and federal funds to address the sites identified as priorities. Coventry will earmark the funds necessary to complete one major project each year for the next 5 years and will keep its culvert inventory current to improve its institutional memory. The town has also adopted municipal road and bridge standards that meet or exceed the 2013 standards and has an approved and annually adopted Local Emergency Operations Plan and Town Plan.

Table 5: Existing Town Actions that Support Hazard Mitigation:

Type of Existing Protection	Description /Details/Comments	Issues or Concerns
Emergency Response		
Police Services	Vermont State Police/Essex County Sheriff	None at this time
Fire Services	Coventry	Continued training for fire and rescue personnel, along with maintaining and updating of equipment is essential.
Fire Department Mutual Aid Agreements	Northeast International Mutual Aid (19 participants)	None at this time
EMS Services	Newport City	Continued training for fire and rescue personnel, along with maintaining and updating of equipment is essential.
Other Municipal Services		
Highway Services	Town Highway Department	Has completed scoping of priority mitigation projects and budgets work each fiscal year.
Highway personnel	1 FTE/2-3 PT field personnel	None at this time
Water Department	Village Water (Managed by Fire District)	Remediation of Arsenic levels due for completion. All Village drains updated.
Planning and Zoning personnel	Town positions filled	None at this time
Residential Building Code / Inspection	No	None at this time
The Coventry Town Foundation	Provides support of educational, community assistance, emergency disaster relief, historic preservation, and other community-based services	None at this time
Emergency Plans		
Local Emergency Operations Plan (LEOP)	2018	Assure sheltering plans and contact information is up to date and vulnerable populations are addressed.

School Emergency/Evacuation Plan(s)	2005	Increased collaboration (with town staff, school, LEPC, NVDA), knowledge of roles and drills
Municipal HAZMAT Plan	None	Continue working/planning relationships with Waste USA/Airport
Shelter, Primary	Coventry School	Working with ARC's Shelter Initiative and have obtained certification, training and supplies. Include volunteer staff in planning communication and schedule drills to test efficacy.
Replacement Power, backup generator	Acquired	Stay proactive with state and FEMA regarding town interests.
Municipal Plans		
Town / Municipal Comprehensive Plan	2018	Update done
Town of Coventry Road Erosion Site Inventory	2017	Created with assistance from ANR
Hazard Specific Zoning (slope, wetland, conservation, industrial, etc.)	Utilize most current state regulations.	Consider using current best practices to guide actions for achieving a "No Adverse Impact" policy as well as assuring future farm development occurs with defined best practices
Participation in National Flood Insurance Program (NFIP) and Floodplain/Flood Hazard Area Ordinance	Active Participation and in good standing with NFIP. Managed by David Barlow, Zoning Admin.	9/27/85 current eff. map date
Certificate of Compliance with Road and Bridge Standards	3/19/2018	https://vtculverts.org/map https://vtculverts.org/bridges#list Strive to coordinate lists and keep up to date

5.2.1. Flood Resilience Goals:

- Mitigate flood hazards in the most cost-effective manner possible
- Minimize the risk exposure and associated expense to Coventry tax payers
- Ensure the Town and its facilities are prepared to meet the demands of the next flood
- Ensure the Town can receive the maximum outside assistance in the event of the next Federally declared disaster

5.2.2. Flood Resilience Strategies:

- Identify and protect natural flood protection assets, including floodplains, river corridors, other lands adjacent to streams, wetlands, and upland forested cover
- Adopt flood hazard regulations that at a minimum, protect property from known risks
- Review and evaluate statewide river corridor information, when it becomes available

- Consider adopting regulations that will protect erosion prone areas for additional Development and encroachment
- Maintain and regularly update the Local Emergency Operations Plan.
- Continue to meet the VTrans Road and Bridge standards. Participate in regional Road Foreman trainings and Transportation Advisory Committee meetings to stay abreast of flood resilience measures for the Town's roads and bridges
- Continue to update the Town's transportation infrastructure information in the Vermont Online Bridge and Culvert Inventory Tool
- Upgrade undersized and failing culverts
- Keep Hazard Mitigation Plan updated every 5 years
- Assure all emergency shelters are adequate and equipped with a generator

5.3 All-Hazards Mitigation Goals

The following goals were developed by the planning team, vetted during a warned community meeting and approved during the development of this plan:

- Reduce at a minimum, and prevent to the maximum extent possible, the loss of life and injury resulting from all hazards.
- Mitigate financial losses and environmental degradation incurred by municipal, educational, residential, commercial, industrial and agricultural establishments due to various hazards.
- Maintain and increase awareness amongst the town's residents and businesses of the damages caused by previous and potential future hazard events as identified specifically in this Local All-Hazards Mitigation Plan.
- Recognize the linkages between the relative frequency and severity of disaster events and the design, development, use and maintenance of infrastructure such as roads, utilities and storm water management and the planning and development of various land uses.
- Maintain existing municipal plans, programs and ordinances that directly or indirectly support hazard mitigation.
- Develop a mechanism for formal incorporation of this Local All-Hazards Mitigation Plan into the multi-jurisdictional municipal comprehensive plan as described in 24 VSA, Section 4403(5). This mechanism will be developed by the Joint Planning Commission, Selectboard and NVDA and integrate the strategies into the existing town plan as annexes until the next formal update occurs, where a section devoted to mitigation planning will be integrated into the plan.
- Develop a mechanism for formal incorporation of this Local All-Hazards Mitigation Plan, particularly the recommended mitigation actions, into the town operating and capital plans & programs as they relate to public facilities and infrastructure within political and budgetary feasibility. The Joint Planning Commission will review the plan and use language/actions from it to inform the integration and update process. Town Meeting Day will serve as the formal time that mitigation strategy budgetary considerations will be approved and incorporated into the town budgets.

5.4 Mitigation Actions

In following FEMA guidance, the following mitigation action categories form the basis of the town's future mitigation actions. The planning team, after considering the basic and generalized format of the 2005 plan, decided to adopt this approach for this update and all future mitigation work. For each mitigation action to follow, an indication of group will be given with the abbreviations listed below:

Mitigation Action Groups:

(P) Prevention: Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.

(PP) Property Protection: Actions that involve the modification of existing buildings or infrastructure to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, flood proofing, storm shutters, and shatter-resistant glass.

(PEA) Public Education & Awareness: Actions to inform and educate citizens, elected officials, and property owners about potential risks from hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

(NRP) Natural Resource Protection: Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

(SP) Structural Projects: Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include storm water controls (e.g., culverts), floodwalls, seawalls, retaining walls, and safe rooms

5.4.1. Current Capabilities, Progress since 2005 and Need for Mitigation Actions

The Town Plan's goals and policies that support hazard mitigation and the existing mitigation actions demonstrate the variety of policies and actions forming the foundation of this All Hazards Mitigation Plan. As with most towns in the state, mitigating flood-prone areas is a continuous effort that sees increased attention following a major event. The town remains aware and diligent in keeping up with mitigation actions for all municipal systems. There exists a collaborative spirit that not only is highly-valued but serves to enhance efficiency of action in essentially, what needs to be done. The Town regards its current hazard mitigation efforts carried

out by the road departments as adequate to address winter storm impacts to local roads, however temporary road closure due to winter storms may isolate parts of town. Winter storms are often the cause of the power loss and telecommunications failure. Tree trimming and vegetation management coupled with maintaining adequate repair vehicles and personnel are the primary means of mitigation. However, the town can incorporate the use of public information to support community resilience during a power outage. As part of the strategies defined in this plan, the town will develop a plan for mass communication and, if telecommunication lines are down, a method for alerting residents of the alternate means of information dissemination and/or protocol (e.g. shelter logistics). Major infrastructure that has seen repeated damage due to flooding is a concern for the town and they are active in identifying priorities, working with State Transportation and Natural Resource Agencies as means to increasing infrastructure resilience.

Progress in Mitigation Efforts

The 2005 only contained the following:

Priority Actions:

Local officials in Coventry have identified several mitigation actions to be included in the Hazard Mitigation Plan. Table 3-B, Implementation Strategy contains these actions, along with the responsible agency, the funding source, and implementation timeframe.

NOTE: There was no "Table 3-B" in the final approved plan and therefore no listed actions to discuss.

5.4.2. Specific Mitigation Actions

The following actions define the mitigation measures to be taken by the town in the next five years:

- Action #1: Improve road infrastructure and municipal systems protection programs
- Action #2: Improve resilience to severe winter storms
- Action #3: Reduce impact of extreme cold durations
- Action #4: Raise public awareness of hazards and hazard mitigation actions
- Action #5: Continue fluvial geomorphology assessments in collaboration with DEC and develop strategies and regulatory actions in response to identified
- Action 6: Reduce risk and impact of hazardous materials incident

Below, each of the seven actions listed above are explained below regarding progress, project leads and partner agencies and specific action steps:

Action #1: Improve road infrastructure and municipal systems protection programs

Group: SP, NRP, PP

Lead Responsible Entity: Town of Coventry, Fire District, Road Forman

Potential Partner Entities: Vermont Agency of Natural Resources; Vermont Agency of Transportation; NVDA, VEM, FEMA and the Agency of Commerce and Community Development

Timeframe: 2019 – 2024

Funding Requirements and Sources: FEMA or other hazard mitigation grants; FHWA grants; VAOT grants; Municipal Operating and Capital budgets.

Progress: The Road Foreman continually monitors road and storm water management capabilities. In 2015, the University of Vermont released Scour research and opportunities for scour sensors. Maintenance and improvement of municipal water, sewer and electric power supply systems is established and ongoing will continue to function as a means of protection. Emergency generators at pump station water facility.

Specific Identified Tasks:

- 1) Infrastructure Assessment for Storm Water Vulnerability – Funding and staff resources permitting, assess the vulnerability and operational capability of municipal-owned roads, culverts and other storm water management infrastructure to predicted storm water and snowmelt in areas with a documented history of recurring problems. The infrastructure will be evaluated regularly prior to replacement or upgrades of the existing infrastructure.
- 2) Assessment for Fluvial Erosion/Landslide Vulnerability – Identify streambanks that have high risk of fluvial erosion that could benefit from riparian plantings or Better Roads grant. Riparian buffers prevent erosion, restore river floodplain, and help reduce the intensity of flood events; therefore, protecting town infrastructure and human health.
- 3) Culvert Upgrades - Develop a schedule and program to replace undersized culverts. Appropriately sized culverts effectively handle the hydraulic capacity of streams and therefore protect town infrastructure from flooding damage.
- 4) Continued Monitoring of Vulnerable Infrastructure - Inventory bridges to document future damage from flooding. A constantly updated inventory will allow Coventry to keep track of frequently damaged infrastructure and will guide planning to avoid future infrastructure damage.
- 5) Road Improvements - Within political and financial restraints, consider re-engineering certain sections of roads to lower overall maintenance costs, improving snow plowing speeds and improve overall capability of roads to handle current and projected traffic volumes. Utilize the Vermont Stream Alteration Permit process when replacing or installing new culverts and bridges as required by State Statute.

Specific projects include:

1. Glen Road and Pine: High risk location for road washouts with high rain events. Better Back Roads Grant received. Undersized culvert needs to be upgraded to 8x10
2. Black River Dredge Proposal: Ice Jams frequently flood the village. Mcdermott's Trucking Company, 5 houses along Main St at risk as well. Town is meeting with State agencies in hopes to be deepen sections of river via dredging process.
3. Webster Road: Section of road in need riprap and ledging. With a sharp corner, proposed action is to lower road and pave.
4. River Road: Need to pave a 400' section to prevent repeated washouts. River Road and High Acres: If road washes out, can cut residents off from travel in and out.

5. High Acres Bridge: Repetitive damage from high water events. Temporary bridge remains for two years. Cost: 500K with 175K in grants.
 6. River Road Bridge: Requires abutment, road continues to drop, decreasing stabilization.
 7. Webster Road: Culvert receives repetitive damage. Current double 24'' culverts need to be replaced by 5ft.
- 6) Increase Awareness of Funding Opportunities - Increase understanding of FEMA's HMGP program so that this potential funding source can be utilized.
 - 7) ICS Training and Emergency Operations (SOP) Plan Development – Enhance knowledge of the principles of ICS and develop a Standard Operating Procedures that details the relationship, roles and responsibilities of the Highway Department and Road Commission during major events.
 - 8) Perform maintenance and upgrades of the Shadow lake Dam as recommended by the Dam Safety Engineers of the Vermont department of Environmental Conservation.
 - 9) Review and update the Emergency Action Plan for Shadow Lake Dam annually
 - 10) Documenting – Develop a methodology that serves to efficiently capture work and expenditures on sites and keep this information at the town office.

Rationale / Cost-Benefit Review: Conducting vulnerability assessments facilitates a targeted and effective approach to road and storm water management infrastructure. This will prove useful in the development and implementation of municipal capital and operating plans as well as the development and implementation of grant-funded mitigation projects. Some areas suffer low-level but consistent damage during heavy rains and snowmelt. Mitigating against these problems would reduce short and long-term maintenance costs and improve the flow of traffic for personal and commercial purposes during flooding events. Tracking road work and understanding the HMGP program can open funding streams into the town and can make the application process much easier when required information is already available. A basic understanding of ICS will serve the town and at little or no cost. As a requirement for an approved LEOP, municipal ICS-awareness is seen as necessary state-wide. During an emergency event when the Highway Department personnel are required to work beyond normal capacity, increased communication and collaboration between the Highway Department and local entities can be enhanced with a basic SOP. An SOP can also serve to increase institutional memory when there are staff changes at every level as well as provide a template from which tabletops and drills can be based off of.

Action #2: Maintain and improve resilience to severe winter storms

Group: SP, PP, PEA

Primary Responsible Entities: Town of Coventry, Selectboard, Planning Commission and Emergency Management director;

Potential Partner Entities: LEPC, Coventry Fire Chief, ARC's Sheltering Initiative Program

Timeframe: 2019 – 2024

Funding Requirements and Sources: VEM or FEMA hazard mitigation funding; existing programs, contingent on available resources and funding.

Progress: Roads are monitored and altered, when necessary so that plowing can occur without damage to trucks and/or road. All designated shelters have a back-up power. Snow clearing equipment is regularly serviced, and the town maintains an adequate supply of salt.

Specific Identified Tasks:

- 1) Maintain Existing Shelter Capability: Maintain and improve capabilities of existing shelters. Notification procedures and shelter staffing is a priority for the town and intends to move forward on planning and public involvement. More formalized training is required and the ARC's "Shelter Initiative Program" can be used at no cost to the town to enhance both shelter management knowledge and sheltering supply cache.
- 2) Reduce risk of power failure due to ice storms: Enhance collaboration between town and private electric company as means of increasing efficiency of mitigation efforts and restoration when systems are down. Maintain function of generators.
- 3) Notification: Develop a notification/communication plan that conveys essential sheltering information using school phone system and back-up methodology (email, text, etc.)
- 4) Residential Programs: Provide guidance and communication to residents on the structural and mechanical actions that can occur to reduce risk to severe winter storms (e.g. weather-proofing, anchoring, alternative heating sources, tree trimming, financial programs, etc.)
- 5) Monitor roads for safe and effective plowing: Efficient snow removal is the foundation to winter storm (snow) events, assuring roads are plowable before winter remains an important facet of highway department functions. Increase communication with rail as deemed necessary to assure safe train travel during heavy snow/ice events.
- 6) Increase awareness of ICS structure and recommended practices: The town can mitigate the effects of a severe winter by understanding how a large-scale storm is managed when the State EOC is operational. Additional awareness of local-level roles and responsibilities during statewide event is a mitigation action.

Rationale / Cost-Benefit Review:

This mitigation action serves to reduce the economic impact and risk to both human and animal (livestock and pet) health and safety during severe winter storm events by reducing risk and enhancing the mechanisms of winter storm mitigation in the long term. More formalized policy formation in both staffing and notification procedures, especially pertaining to vulnerable populations where transportation and special needs are a concern could potentially significantly reduce the physical, psychological and social impacts of a disaster.

Action #3: Reduce impact of extreme cold durations

Group: PEA, PP, SP

Risk or Hazard Addressed: Risk to infrastructure, livestock and residents

Primary Responsible Entities: Town of Coventry Selectboard and planning commission, NVDA, Coventry School, local/regional assistance organizations.

Potential Partner Entities: Vermont DMEHS, LEPC

Timeframe: 2019 – 2024

Funding Requirements and Sources: Financial factors may produce barriers to change. Strategic planning and understanding of the total scope of needs and potential for change is logical first-step.

Specific Identified Tasks:

- 1) Economic Resilience: Establish program for assistance in paying heating bills during crisis situations, if not already required by state law. Develop and sustain a program that serves to connect resource organizations with residents in need of support services.

- 2) Maintain Existing Shelter Capability: Maintain and improve capabilities of existing shelters. Notification procedures and shelter staffing is a priority for the city and intends to move forward on planning and public involvement. More formalized training is required and the ARC's "Shelter Initiative Program" can be used at no cost to the town to enhance both shelter management knowledge and sheltering supply cache.
- 3) Assess Vulnerable Population— Develop an awareness of the most at-risk community members during an evacuation and/or sheltering event. Focusing on those that lack resources or capability to reach facilities when in need and create plans, including outreach protocol on how to address this potential hurdle.
- 4) Notification and Education – Investigate and develop a notification/communication plan that conveys essential sheltering information. Educating citizens regarding the dangers of extreme cold and the steps they can take to protect themselves when extreme temperatures occur by sustaining a process that serves to disseminate educational resources for homeowners and builders on how to protect pipes, including locating water pipes on the inside of building insulation or keeping them out of attics, crawl spaces, and vulnerable outside walls. Inform homeowners that letting a faucet drip during extreme cold weather can prevent the buildup of excessive pressure in the pipeline and avoid bursting through a yearly public service campaign.

Rationale / Cost-Benefit Review:

With an increase in extreme weather, including cold, there is a need to protect property and the population. Given the magnitude of population dependence on social services, indicating economic and other social vulnerabilities, effective outreach, education and collaboration with resources supports this mitigation action category.

Action #4: Raise public awareness of hazards and hazard mitigation actions

Group: PEA

Risk or Hazard Addressed: Risk to property, residents

Lead Responsible Entities: Town of Coventry, Fire Chief, LEPC, NVDA

Potential Partner Entities: Vermont state agencies and regional organizations

Timeframe: 2019 – 2024

Funding Requirements and Sources: Majority of information is available and both state agencies and organizations can provide materials for outreach

Progress: As mitigation planning continues to integrate into normal, day-to-day operations, the town has an opportunity to engage its residents with information that will serve to mitigate several risks. The LEPC meets regularly and covers a host of topics related to emergency preparedness and raises awareness in the community about what organizations are doing around emergency response planning and chemical safety. Town meeting day can serve as an annual update and outreach opportunity as well.

Specific Identified Tasks:

- 1) Hazard Resilience for Property Owners- Develop and maintain education materials to inform property owners on how to protect their homes and businesses through accepted hazard resilience actions (e.g. securing their structures from high winds, elevating their electrical equipment/furnaces in basements, protecting from lightning strikes by grounding electrical outlets, etc.).
- 2) HMGP Awareness: Attend informational sessions on the HMGP funding opportunities for acquisition, elevation and flood-proofing projects. Work with NVDA to develop an information brochure for residents.
- 3) School Programs: Assure the school is structurally ready to handle natural hazard risks to the greatest extent possible. Continue school programs to raise student awareness of hazards, safety, preparedness and prevention. Explore establishing the school emergency notification system as the primary methodology for all emergency notification procedures and build in the contact information accordingly.
- 4) Family Programs – Continue family programs, such as car safety seat and bike safety programs, to raise family awareness of hazards, safety, preparedness and prevention.
- 5) Fire Prevention Programs – Continue National Fire Prevention Week and other programs to raise public awareness of fire hazards, safety, preparedness and prevention.
- 6) Other hazard awareness programs – Develop public awareness programs, based on all-hazards needs. Programs to address pandemic hazards, preparedness and mitigation may be appropriate as directed by the state department of health and its jurisdictional offices of local health

Rationale / Cost-Benefit Review: Improved public awareness could potentially significantly reduce the loss of life and property damage through ongoing, formal, ongoing, public information campaigns that address property protection actions (flood proofing, elevation, anchoring mobile homes/propane tanks, electric and water system elevation, electric grounding, etc.) Improved awareness would also build understanding and public support for municipal mitigation actions to reduce potential infrastructure and liability costs.

Action #5: Continue fluvial geomorphology assessments in collaboration with DEC and develop strategies and regulatory actions in response to identified risks

Group: P, NRP, PEA, PP

Risk or Hazard Addressed: Risk to infrastructure, residents

Primary Responsible Entities: Department of Environmental Conservation, NVDA, Agency of Natural Resources (VT ANR), Town of Coventry.

Potential Partner Entities: Nonprofits, other Town of Coventry officials, and other appropriate entities.

Funding Requirements and Sources DEC has completed assessments for Basin ID 15 (Passumpsic). NVDA can assist in enhanced mapping of the floodplain (if and when these are developed) within the town and has provided the town with updated River Corridor Maps.

Specific Identified Tasks

- 1) Fluvial Geomorphic Assessments – The town will work with DEC through coordinated meetings, workshops and communication to increase understanding of current findings and develop an applicable framework to help guide decisions related to priority infrastructure work and vulnerability.
- 2) Fluvial Erosion Hazard Mapping – Develop a fluvial erosion hazard map for the waterways, using the GIS extension known as SGAT (or Stream Geomorphic Assessment Tool) for assessed stream reaches. As assessments are completed, a map of all assessed waterways in the town will be created.
- 3) River Corridor Management Plans – Using the River Corridor Maps, the town will develop an outreach strategy to residents/structures in or near the defined corridor. This communication should focus on flood resilience measures and opportunities. With the lack of repetitive loss properties in the town, the likelihood of viable HMGP acquisition projects is low but increasing awareness of this program can serve the town well.
- 4) Fluvial Erosion Hazard Mitigation Implementation - The town will draft strategies to avoid or mitigate losses from the identified fluvial erosion hazards. These strategies may include the adoption and implementation of programs, mechanisms or regulations to prevent endangerment of persons and property in riparian corridor areas from fluvial adjustment processes. Efforts could range from a relatively simple, public information campaign about the map to the adoption of a municipal ordinance or by-law that restricts development in such hazard areas.

Rationale / Cost-Benefit Review:

Continuing this project will require a sustained succession of grants, state appropriations and other funding to complete assessments in Coventry. Successful completion will provide municipal and regional benefits. The municipality's fluvial erosion areas would be adequately and electronically mapped. This will enable the municipality to make residents and businesses aware of fluvial erosion hazards and potentially lead to municipally-directed programs, mechanisms and regulations that further mitigate against this hazard, protecting existing structures and infrastructure. Identifying fluvial erosion hazard areas could also help the municipality restrict future development in hazardous areas, if that should be an advantage to the town in the future. More accurate knowledge of fluvial geomorphology will enable the community to have a better understanding of hazard areas and what mitigation measures might most effectively address those concerns. Flooding is the most common and most significant hazard that can trigger a Federal disaster declaration in Coventry. Along with the creation of flood hazard area maps, identifying the fluvial erosion hazard areas provides improved opportunities for the community to mitigate potential losses and gauge future development initiatives.

Action 6: Reduce risk and impact of hazardous materials incident

Group: PEA, PP, SP

Risk or Hazard Addressed: Risk to infrastructure, environment, livestock and residents

Primary Responsible Entities: Town of Coventry Selectboard and planning commission, NVDA, Ethan Allen, Blanchard Oil, D&C Transport, local/regional assistance organizations.

Potential Partner Entities: Vermont DMEHS, LEPC

Funding Requirements and Sources: Financial factors may produce barriers to change. Strategic planning and understanding of the total scope of needs and potential for change is logical first-step. Using HMEP funding to better understand scope will be explored through LEPC.

Specific Identified Tasks:

- 1) Work with facility leads on understanding risk factors and what can be done to mitigate and enhance training and skills for response to major highway accidents
- 2) Develop understanding of likely chemical characteristics and what area would be impacted under likely scenarios involving discharge/spill
- 3) Explore using HMEP funding to increase awareness, knowledge and collaboration a means to developing future mitigation actions
- 4) Explore using Homeland Security exercise planners to develop tabletop exercise based on likely scenarios

5.4.3. Prioritization of Mitigation Strategies

Because of the difficulties in quantifying benefits and costs, it was necessary to utilize a simple “*Action Evaluation and Prioritization Matrix*” in order to affect a simple prioritization of the mitigation actions identified by the town. This method is in line with FEMA’s STAPLEE method. The following list identifies the questions (criteria) considered in the matrix so as to establish an order of priority. Each of the following criteria was rated according to a numeric score of “1” (indicating poor), “2” (indicating below average or unknown), “3” (indicating good), “4” (indicating above average), or “5” (excellent).

- Does the action respond to a significant (i.e. likely or high risk) hazard?
- What is the likelihood of securing funding for the action?
- Does the action protect threatened infrastructure?
- Can the action be implemented quickly?
- Is the action socially and politically acceptable?
- Is the action technically feasible?
- Is the action administratively realistic given capabilities of responsible parties?
- Does the action offer reasonable benefit compared to its cost of implementation?
- Is the action environmentally sound and/or improve ecological functions?

Table 5-2: Coventry Action Evaluation and Prioritization Matrix

The ranking of these criteria is largely based on best available information and best judgment of project leads. For example, all road improvement projects were initially identified by Road Foreman and approved for inclusion in this plan by the road commission. It is anticipated that, as the town begins to implement the goals and actions of their Mitigation Strategies, they will undertake their own analysis in order to determine whether or not the benefits justify the cost of the project. Also, most proposed FEMA HMGP mitigation projects will undergo a benefit-cost analysis using a FEMA BCA template and approved methodology.

Rank	Mitigation Action	Responds to high hazard	Funding potential	Protection value	Time to implement	Social and Political acceptance ¹	Technical feasibility	Admin feasibility	Benefit to Cost	Environmental advantage	TOTAL
2	Improve road infrastructure and municipal systems protection programs	5	4	5	2	5	4	4	5	4	38
3	Improve resilience to severe winter storms	2	5	5	4	5	5	4	5	2	37
4	Reduce impact of extreme cold durations	3	2	4	2	3	2	2	3	3	24
5	Reduce vulnerability to hazardous materials incident	3	4	5	2	5	3	3	5	1	27
1	Raise public awareness of hazards, hazard mitigation and disaster preparedness	4	5	5	5	5	5	5	5	3	43
6	Continue fluvial geomorphology (in coordination with state recommendations and protocol) assessments and develop strategies in response to any identified risk	3	2	4	2	2	2	2	3	3	23

5.5 Implementation and Monitoring of Mitigation Strategies

5.5.1. Public Involvement Following Plan Approval

After adoption, the town will continue to maintain web-presence of the mitigation plan with an opportunity for community input available on its website. Additionally, the town will hold an annual public meeting after performing the annual progress report for the mitigation plan to discuss achievements and the following year's implementation plan. At town meeting, the town will present mitigation information and provide the public an opportunity to increase understanding and involvement with planning efforts. The LEPC will also host an annual mitigation plan presentation where response/state agencies, neighboring communities and other stakeholders can provide input. The town will also notify its neighboring municipalities of the availability of information for review and any significant risks and/or mitigation actions that have an impact on surrounding towns.

¹ All mitigation actions outlined in this plan are, and will continue to be, consistently assessed for feasibility related to the social, political and financial factors that are inherent to town operations.

5.5.2. Project Lead and Monitoring Process

The town's selectboard are the project leads and will work in conjunction with the selectboard, town clerk and NVDA to complete the yearly progress report included in the plan. The town will create a mitigation action collection system that will be used as the source of future updates following the annual evaluation that will occur in conjunction with the progress report using the Plan Implementation Matrix provided below. While mitigation actions are, by default, often addressed at monthly Selectboard meetings, the town will schedule one meeting annually to formally assess the plan and adopt updates following the annual progress report and community meeting regarding the LHMP. Once the plan is approved by FEMA, the calendar will begin for annual review. The town will take the following implementation matrix and add actions to it each year, modifying tasks and/or needs as required so that the next LHMP update will be populated with the specific actions related to each mitigation strategy by year.

5.5.3 Plan Evaluation and Update Process

The town's Selectboard chair will lead the plan evaluation process as part of the annual progress report. Prior to town meeting and in preparation for the annual town report, a mitigation section will be included that provides an executive summary for the public that addresses the following topics:

- Status of recommended mitigation actions for the five-year planning period
- Identification of barriers or obstacles to successful implementation or completion of mitigation actions, along with possible solutions for overcoming risk
- Identification of a lead person to take ownership of, and champion the plan if different from Selectboard
- An approach to evaluating future conditions (i.e. socio-economic, environmental, demographic, change in built environment etc.)
- Discussion of how changing conditions and opportunities could impact community resilience in the long term
- Discussion of how the mitigation goals and actions support the long-term community vision for increased resilience

By engaging in the annual evaluation, the town will have a viable method for capturing the facets of efficacy and areas needing revision and improvement in its mitigation plan. The town is committed to “institutionalizing” mitigation into its normal operating procedures and with approval of this plan, embarks on the formal incorporation of mitigation actions and discussion, maintaining an awareness that involves not only the Selectboard, Town Clerk and Road Foreman but also the community at large, including the organizations represented by the current planning team. Along these lines, the town will maintain a contact list of the current planning team and make revisions as required, including the team on the evaluation process each year. Through this consistent attention resulting from the evaluation process, progress reports and communication in the annual town report, the town will achieve the consistency required to enhance resilience through planning, assessment and actions devoted to mitigation.

5.5.4. Plan Update Process

The Plan update will be led by the Selectboard Chairs. Depending on funding availability, the town may elect to acquire the assistance of NVDA and/or a consultant to update the plan

following a declared disaster and/or the next five-year planning cycle. To assure that the Plan does not expire, the town will begin the update process within no less than six months of the current Plan's expiration date. Following a disaster and during the recovery phase, the town will use the experience to assess the current Plan's ability to address the impact of the most recent disaster and edit the plan accordingly. Using the annual progress reports and evaluation narratives as a guide, along with perceived changes in risk or vulnerabilities supported by data and/or observation, strategies will be captured in accordance with FEMA guidelines, which includes reconvening the planning team during the update process. The town will establish a "Mitigation File" that documents all evaluations and progress reports, along with actions, especially related to infrastructure improvement projects. While the progress reports are designed to capture the specific actions, the town has accomplished related to implementation, keeping a narrative list with dates on all actions relatable to mitigation (e.g. school drills, LEOP updates, Fire Safety Awareness, meetings, etc.), will provide the town the bulk of information required in the update process.

5.5.5. Implementation Matrix for Annual Review of Progress

The following table is intended to aid municipal officials in implementing the mitigation actions for Coventry Town and to facilitate the annual monitoring and progress reporting. Progress has been included as a guide to future updates. Each year, the town will reserve a Joint Planning Commission meeting to review and update the Implementation Matrix as means to establishing an accurate evaluation of the plan's efficacy and the information required for the succeeding update to the plan. Each Jurisdiction will fill in the implementation matrix specific to work accomplished relevant to the actions outlined, especially as it pertains to outreach, municipal system actions and road improvement projects.

Table 5-3 Implementation Matrix for Annual Review

Action	Primary Responsible Entity	Timeline	Task	Brief Description	Annual Progress: 2017 Progress
Continue fluvial geomorphology assessments and develop strategies in response to identified risk.	VT DEC, NVDA, VT ANR, Town Selectboard	Spring 2020- Fall 2022	Fluvial Geomorphic Assessments and assessment-based mapping/action	Continue Phase I and Phase II fluvial geomorphic assessments on streams and waterways in Barton .	DEC has a comprehensive and interactive database for the Basin and Dam preparedness has done some of this work in the past that the town can build from.
	NVDA, VT ANR, Town Selectboard	Fall 2019- Fall 2022	Fluvial Erosion Hazard Mapping	Rate the fluvial erosion hazard for each assessed reach and develop a fluvial erosion hazard map for the waterway using SGAT. Create map of all assessed reaches. Submit to VT ANR for QA/QC.	
	NVDA, Town Selectboard	Fall 2019- Fall 2022	River Corridor Management Plans	Where Phase I and II assessments are complete, develop a River Corridor Management Plan.	NFIP Participant
	Town Selectboard	Fall 2019- Fall 2022	Fluvial Erosion Hazard Mitigation Implementation	Develop strategies to mitigate losses from identified fluvial erosion hazards.	Major infrastructure enhancement has occurred as result of flooding with FEH-specific projects planning in current planning cycle
	Town Selectboard	Spring 2020- Spring 2021	Flood Insurance Rating Map Updates	Review draft FIRM data. Update floodplain regulations/zoning.	There have been 3 LOMCS according to FEMA database

Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress
Improve road infrastructure and municipal systems protection programs	Town Road Foreman and Vtrans	Fall 2019-Fall 2020	Infrastructure Assessment for Storm Water Vulnerability	Assess the vulnerability and operational capability of municipal roads, culverts and storm water infrastructure.	Town has identified projects with problem, priority and estimated budget. With great institutional memory of town infrastructure, the highway department is well-equipped to assess, monitor and prioritize needs.
	Town Road Foreman, ANR	Fall 2019-Fall 2022	Infrastructure Assessment for Fluvial Erosion Vulnerability	Assess the vulnerability and operational capability of municipal roads, culverts, bridges and systems infrastructure to fluvial erosion.	Road and Bridge Standards adopted and meet or exceed 2013 standards.
	Town Road Foreman and Vtrans	Spring 2019-Fall 2024	Culvert Upsizing	Upsize culverts and ditching along roads to mitigate against repeated damages from storm water or spring snowmelt.	VT CULVERTS .ORG Culvert and Bridge Inventory has been populated.
	Town Road Foreman and Vtrans	Spring 2019	Continued Monitoring of Vulnerable Infrastructure	Inventory bridges to document future damage from flooding. A constantly updated inventory will allow Coventry to keep track of frequently damaged infrastructure and will guide planning to avoid future infrastructure damage.	Bridge replacement scheduled for 2019
	Town Road Foreman and Vtrans	Fall 2019-Fall 2024	Road Improvements	Within political and financial restraints, consider re-engineering certain sections of roads to lower overall maintenance costs, improving snow plowing speeds and improve overall capability of roads to handle current and projected traffic volumes.	Projects named and scoped. Each annual update will list accomplished projects here: PROJECTS ACCOMPLISHED:

Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress
continued	Selecboard	Fall 2020- Sprng 2021	Develop SOP for emergency events based on any identified need and political/financial restraints. ICS training for municipal staff	Building on current Emergency Operations Plans for the Highway Department and Road Commission, and SOP can help clearly define expectations, roles and responsibilities. Develop understanding of eligibility criteria for HMGP projects.	Communication between Highway Department and Road Commission is ongoing. ICS required for LEOP approval.
	Selecboard	Fall 2019- Winter 2022	Increase Awareness of Funding Opportunities	Increase understanding of FEMA's HMGP program so that this potential funding source can be utilized.	New
	Town Road Foreman and Clerks	Summer 2020- Fall 2020	Documenting	Develop a methodology that serves to efficiently capture work and expenditures on sites and keep this information at the town office as time and financial constraints allow	Improve current system could enhance efficiency of proving prior damage
Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress

Maintain and improve resilience to severe winter storms	Emergency Management Director (EMD), NVDA and Selectboard	Fall 2019- Winter 2020	Improve Existing Shelter Capability/ Investigate Alternate Shelters	Maintain and improve on capabilities of existing emergency shelter capability, including emergency generator functionality. Investigate capabilities of other buildings sufficient to serve as smaller shelters.	All shelters have a generator. Explore additional shelter and secure funding for emergency power if required.
	Emergency Management Director (EMD), electric service management in conjunction with selectboard	Fall 2020- Winter 2023	Reduce risk of power failure due to ice storms:	Enhance collaboration between town and private electric company as means of increasing efficiency of mitigation efforts and restoration when systems are down. Maintain function of generators.	Current communication and operations are working well but room for improvement possible within financial and political restraints.
	SELECTBOARD, shelter facility leads	Fall 2020- Winter 2020	Notification	Develop a notification/communication plan that conveys essential sheltering information using school phone system and back-up methodology (email, text, etc.)	New
	NVDA EMC in conjunction with SELECTBOARD	Fall 2020- Winter 2020	Residential Programs	Provide guidance and communication to residents on the structural and mechanical actions that can occur to reduce risk to severe winter storms (e.g. weather-proofing, anchoring alternative heating sources, tree trimming, financial programs, etc.)	FEMA, VEM and other state agencies publish annual materials that can be obtained and distributed
	Town Road Foreman, SELECTBOARD and Vtrans	Winter 2019- Winter 2024	Monitor roads for safe and effective plowing	Efficient snow removal is the foundation to winter storm (snow) events, assuring roads are plowable before winter remains an important facet of highway department functions. Increase communication with rail as	Ongoing

				deemed necessary to assure safe train travel during heavy snow/ice events.	
	Town Road Foreman, SELECTBOARD and Vtrans	Winter 2019-Winter 2024	Increase awareness of ICS structure and recommended practice	The town can mitigate the effects of a severe winter by understanding how a large-scale storm is managed when the State EOC is operational. Additional awareness of local-level roles and responsibilities during statewide event is a mitigation action	ICS required but enhanced understand may benefit
Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress
Reduce impact of	SELECTBOARD,	Winter 2019-2	Economic Resilience	Within political and financial	New

<p>extreme cold durations</p>	<p>NVDA, relevant state agencies and non-profits</p>			<p>restraints, establish program for assistance in paying heating bills during crisis situations, if not already required by state law. Develop and sustain a program that serves to connect resource organizations with residents in need of support services</p>	
	<p>SELECTBOARD, EMD</p>	<p>Fall 2019- Winter 2024</p>	<p>Maintain Existing Shelter Capability:</p>	<p>Maintain and improve capabilities of existing shelters. Notification procedures and shelter staffing is a priority for the city and intends to move forward on planning and public involvement. More formalized training is required and the ARC's "Shelter Initiative Program" can be used at no cost to the town to enhance both shelter management knowledge and sheltering supply cache.</p>	<p>Ongoing with improvements planned</p>
	<p>SELECTBOARD, Rescue services, Fire Departments, EMD</p>	<p>Winter 2020- Winter 2022</p>	<p>Assess Vulnerable Population</p>	<p>Develop an awareness of the most at-risk community members during an evacuation and/or sheltering event. Focusing on those that lack resources or capability to reach facilities when in need and create plans, including outreach protocol on how to address this potential hurdle.</p>	<p>New</p>
	<p>SELECTBOARD, Fire Departments, EMD, Health Officer (suggested)</p>	<p>Winter 2019- Winter 2022</p>	<p>Notification and Education</p>	<p>Investigate and develop a notification/communication plan that conveys essential sheltering information. Educating citizens regarding the dangers of extreme cold and the steps they can take to</p>	<p>New</p>

				<p>protect themselves when extreme temperatures occur by sustaining a process that serves to disseminate educational resources for homeowners and builders on how to protect pipes, including locating water pipes on the inside of building insulation or keeping them out of attics, crawl spaces, and vulnerable outside walls. Inform homeowners that letting a faucet drip during extreme cold weather can prevent the buildup of excessive pressure in the pipeline and – avoid bursting through a yearly public service campaign.</p>	
Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress

Reduce risk and impact of hazardous materials incident	SELECTBOARD, Fire Department, facility leads	Spring 2020-Winter 2021	Work with facility leads on understanding risk factors and what can be done to mitigate and enhance training and skills for response to major highway accidents	HMEP funds through LEPC can facilitate this work by LEPC members or via consultant	New
	LEPC, EMD, Fire Chiefs	Spring 2020-Spring 2021	Develop understanding of likely chemical characteristics and what area would be impacted under likely scenarios involving discharge/spill	See above	New
	LEPC, NVDA, EMD, Fire Chiefs	Winter 2019-Winter 2024	Explore using HMEP funding to increase awareness, knowledge and collaboration a means to developing future mitigation actions	See above	New
	NVDA and SELECTBOARD, EMD, LEPC	Fall 2023-Fall 2024	Explore using Homeland Security exercise planners to develop tabletop exercise based on likely scenarios	Planners will develop exercise to test response and manage from start to finish is funding permits	New
Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress
Raise public awareness of hazards, hazard mitigation and	EMD, Fire Chiefs, Rescue Services	Fall 2019-Fall 2024	Residential Programs	Develop and maintain education materials to inform property owners on how to protect their homes and	New

disaster preparedness.				businesses through accepted hazard resilience actions (e.g. securing their structures from high winds, elevating their electrical equipment/furnaces in basements, protecting from lightning strikes by grounding electrical outlets, etc.).	
	EMD, Fire Chiefs	Fall 2019-Fall 2024	Family Programs	Continue family programs, such as car safety seat and bike safety programs, to raise family awareness of hazards, safety, preparedness and prevention.	Ongoing
	Fire Chiefs	Fall 201-Fall 2024	Fire Prevention Programs	Continue National Fire Prevention Week and other programs to raise public awareness of fire hazards, safety, preparedness and prevention.	Ongoing
	LEPC, Fire Chief	Fall 2019-Fall 2024	Other hazard awareness programs	Develop public awareness programs, based on all-hazards needs.	Ongoing

Additional Actions	Primary Responsible Entity	Timeline	Task	Brief Description	Progress

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APPENDICES

NOTE: Appendices A-D not included with State submission or for FEMA review)

Appendix A: Community Reports: Coventry (Flood Ready Vermont)

Appendix B: Culvert Locator: (VTrans)

Appendix C: No Adverse Impact Floodplain Management Fact Sheet (ASFPM)

Appendix D: Farm Structures in Designated Flood Hazard Area Planning Checklist (VAAFV)

Town of Coventry Multi-Jurisdictional Hazard Mitigation Plan Community Outreach Form

Introduction: Hazard Mitigation Planning works to protect a community and is a mandatory requirement before any FEMA funding can be awarded to a town to repair infrastructure or acquire critical equipment. By developing an approved plan, the town can earn a greater percentage of state funding during recovery from a disaster and be better prepared to handle a future event. Your input is crucial to the planning process and the information you provide will help produce a plan that will serve the town for years to come. Please take the time to share your thoughts on the questions below. Thank you!

Please return form to: Coventry Town Clerks Office via:

- In-person or by mail: 34 Main St.
Coventry, VT 05822
- Email: Coventrytown@comcast.net

Resident, Employee or Business Owner (please circle all that apply)

Community Concerns:

1. What are your general concerns about emergency events in the town?

1. As a resident, business owner or employee of the Town of Coventry, what are your concerns about emergency events in the town? – Flooding in the village is a major problem and danger for residents living any where near the river. Due to increased high water events, the Town of Coventry should first work toward flood remediation in order to protect village residents over the long-term. Also, we need support heavy equipment, pumps and other pivotal equipment to respond quickly to emergency flood events, both in winter and summer. Another issue could be a major toxic spill in or near the village because of the unusually large number of trucks carrying waste to and from the land fill. In addition, heavy trucking carrying logs, concrete, paving materials, gravels and stone all make for very large and heavy vehicles continually traveling the major roadways in the Town of Coventry; thus, the potential for environmental and human injury. Also, with large-scale farming and use of extremely toxic herbicides, the potential does exist for a severe environmental disaster which could impact drinking water for humans and wildlife. What do you think the community should plan to accomplish to be better prepared for the next emergency event? It is also important for the Town of Coventry to establish a FEMA ready plan in order to be able to respond quickly with financial and infrastructure repairs due to such traumatic events as flooding, fire, vehicular accidents, toxic spills

Village vulnerability to flooding. Flooding could cut road travel from the north, where many of the Town's emergency services are located. ___ Response capability to

environmental emergency (ies) at the Landfill and/or Washington Electric Coop (WEC) generation facility at the Landfill. Fire, flood, landslide, etc.

Notification and evacuation procedures. Shelter supplies and personal

- 2. What other thoughts or concerns do you have about emergencies, hazards and emergency response in the town**

Make sure to have easy and immediate access to emergency vehicles and equipment, be it for fire, flood, toxic waste, drinking water, all things directly impacting human and environmental safety.

Dredge the Black River before and after the intersection of Rt 5 and Rt 14 , so that the River has increased capacity at that critical point. Study other areas of the River that might need clearing and/or other improvements to reduce flooding threats.

Have an emergency response team that can report/help out
Where residents can report safety concerns?
Clean drinking water