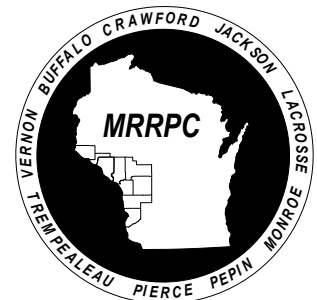


VERNON COUNTY WISCONSIN

MULTI- HAZARDS MITIGATION PLAN 2018-2022



This plan was prepared by the Mississippi River Regional Planning Commission through a cooperative cost sharing agreement with the Vernon County Board of Supervisors, the Mississippi River Regional Planning Commission, Wisconsin Emergency Management, and the Federal Emergency Management Agency.



ABSTRACT

Title: VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN

Plan Purpose: This plan's purpose is to identify goals, projects and actions the county, other local governments and other organizations can undertake to reduce hazard risks to life, health and property.

This plan through properly addressing the federal requirements in the Disaster Mitigation Act of 2000 makes the county and other local governments that participated in the planning process eligible for Federal Hazard Mitigation Grant Programs. These programs can assist in planning, relocation and infrastructure projects that reduce and sometimes eliminate losses and damage from hazards.

Plan Participants: This plan was prepared under the direction of the County Emergency Management Committee who coordinated their plan development efforts through the County Emergency Management Director. The Mississippi River Regional Planning Commission who wrote a planning grant to fund this plan was contracted with to write the plan and facilitate public meetings.

Plan Contact Information: Brandon Larson, Vernon County Emergency Management Director
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Viroqua, WI 54665
Telephone: 608-637-5266

Mississippi River Regional Planning Commission
1707 Main Street, Suite 435
La Crosse, WI 54601
Telephone: 608-785-9396

RESOLUTION # 2018-53

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, Vernon County recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted all hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, Vernon County participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan; and

NOW, THEREFORE, BE IT RESOLVED, that Vernon County, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Vernon County Emergency Management Department will submit on behalf of the participating municipalities the adopted Vernon County Multi-Hazards Mitigation Plan 2018-2022 to Wisconsin Emergency Management and Federal Emergency Management Agency officials.

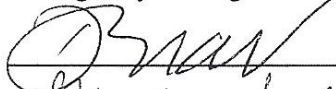


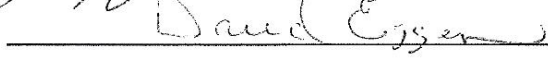
PASSED: 11-27-18



Certifying Official

Passed
4-0 1 absent

Respectfully Submitted
Emergency Management Committee

Attest

 -12-18-18

VERNON COUNTY, WISCONSIN MULTI-HAZARDS MITIGATION PLAN 2018-2022

TABLE OF CONTENTS

ABSTRACT

1.0 – VERNON COUNTY MULTI-HAZARDS MITIGATION PLANNING PROCESS	1-1
Disaster Mitigation Act of 2000-DMA2K	1-1
Plan Committees and Organizations	1-1
Public Involvement	1-1
Funding for the Vernon County Multi-Hazards Mitigation Plan	1-2
Incorporated Plans, Studies, Reports and Technical Data	1-3
Plan Contents	1-3
Updated Information	1-3
Plan Contact Information	1-3
Table 1-1 – Risk Assessment Survey Mailing List	1-4
Table 1-2 – Project Needs Survey Mailing List	1-5
Table 1-3 – Municipal Survey Results	1-6
2.0 – VERNON COUNTY PLANNING AREA	2-1
General Geography	2-1
Demographic and Economic Profile	2-2
Table 2-1 - Vernon County Population and Land Area Data	2-2
Table 2-2 - Vernon County Housing and Housing Units per Square Mile	2-3
Table 2-3 - Vernon County Employment by Industry	2-4
General Development Pattern	2-5
Table 2-4 - Vernon County Land Use	2-5
3.0 - VERNON COUNTY RISK ASSESSMENT	3-1
Historical Occurrence Rating Criteria	3-1
Vulnerability Rating Criteria	3-1
Probability Rating Criteria	3-1
Local Official Hazard Survey Rating Criteria	3-1
Risk Assessment Designation	3-2
3.1 - Vernon County, Hailstorm Risk Assessment	3-2
3.2 - Vernon County, Lightning Storm Risk Assessment	3-4
3.3 - Vernon County, Thunderstorm Risk Assessment	3-6
3.4 - Vernon County, Tornado/High Winds Risk Assessment	3-9
3.5 - Vernon County, Flooding Risk Assessment	3-12
3.6 - Vernon County, Dam Failure Flooding Risk Assessment	3-18
3.7 - Vernon County, Forest/Wildland Fire Risk Assessment	3-20
3.8 - Vernon County, Heavy Snowstorm Risk Assessment	3-22
3.9 - Vernon County, Ice Storm Risk Assessment	3-24
3.10 - Vernon County, Blizzard Risk Assessment	3-26
3.11 - Vernon County, Extreme Cold Risk Assessment	3-27
3.12 - Vernon County, Earthquake	3-29
3.13 - Vernon County, Extreme Heat Risk Assessment	3-30
3.14 - Vernon County, Agricultural Risk Assessment	3-32
3.15 - Vernon County, Drought Risk Assessment	3-33
3.16 - Vernon County, Fog Risk Assessment	3-34
3.17 - Vernon County, Landslide Risk Assessment	3-36
3.18 - Vernon County, Subsidence Risk Assessment	3-37
3.19 - Vernon County, Pandemic Flu Risk Assessment	3-38
3.20 - Vernon County, Railroad Risk Assessment	3-41
3.21 - Vernon County, River Traffic Risk Assessment	3-42

TABLES

Table 3-1 - Vernon County Local Official, Hazard Risk Assessment Survey	3-45
Table 3-2 - Vernon County Hazard Risk Assessment	3-46
Table 3-3 - Vernon County Structures in the 100-Year Floodplain	3-47

VERNON COUNTY, WISCONSIN MULTI-HAZARDS MITIGATION PLAN 2018-2022

TABLE OF CONTENTS

TABLES (continued)

Table 3-4 - Vernon County (100 Year) Flood Damage Potential for Residences and Businesses	3-48
Table 3-5 - Vernon County Transportation Assessment.....	3-50
Table 3-6 - Vernon County Business Vulnerability Assessment.....	3-51
Table 3-7 - Vernon County Critical Facilities - Government and Military Facilities	3-52
Table 3-8 - Vernon County Critical Facilities – Hospitals, Clinics, and Residential Care Facilities.....	3-52
Table 3-9 - Vernon County Critical Facilities – Police and Fire Facilities.....	3-53
Table 3-10 - Vernon County Critical Facilities – Schools.....	3-54
Table 3-11 - Vernon County Critical Facilities – Wells.....	3-55
Table 3-12 - Vernon County Critical Facilities – Wastewater Treatment Plants	3-55
Table 3-13 - Vernon County Critical Facilities – Hazardous Material Sites	3-56
Table 3-14 - Vernon County Critical Facilities – Dams	3-57
Table 3-15 - Dam Failure Impact Summary.....	3-61

MAPS

Map 3-1 – Vernon County Critical Facilities- Government, Military, Wastewater Treatment Plans and Wells	3-62
Map 3-2 – Vernon County Critical Facilities – Hospitals, Clinics and Residential Care.....	3-63
Map 3-3 – Vernon County Critical Facilities – Police, Fire Departments and Hazardous Material Sites	3-64
Map 3-4 – Vernon County Critical Facilities – Schools.....	3-65
Map 3-5 – Vernon County Critical Facilities – Dams	3-66
Map 3-6 – Vernon County Structures within the FEMA 100-Year Boundary	3-67
Map 3-7 – Vernon County State and County Trunk Highways Impacted By Flooding	3-68

4.0 – VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN STRATEGIES4-1

Table 4-1 – Vernon County Multi-Hazards Mitigation Goals.....	4-1
Table 4-2 – Vernon County Multi-Hazards Mitigation Actions and Projects	4-2
Table 4-3 – Municipal Multi-Hazards Mitigation Actions and Projects	4-7
Table 4-4 – Individual Municipal Multi-Hazards Mitigation Projects.....	4-10
Table 4-5 – Vernon County Multi-Hazards Mitigation Action Plan	4-14

5.0 – PLAN MAINTENANCE AND ADOPTION5-1

Plan Maintenance	5-1
Plan Coordination	5-1
Municipal Authority to implement the Plan.....	5-1
Plan Approval Process	5-1
Adoption Resolutions	5-2

APPENDICES

Appendix A – Risk Assessment Survey and Mitigation Projects Survey.....	A-1
Appendix B – Public Hearing Notices, Emergency Management Committee, Towns Assoc., & MRRPC Agendas	B-1

1.0 VERNON COUNTY MULTI-HAZARDS MITIGATION PLANNING PROCESS

Disaster Mitigation Act of 2000-DMA2K

The development of the Vernon County All-Natural Hazards Mitigation Plan 2004 –2009 and this update to that plan was the result of the passage of the Disaster Mitigation Act of 2000 (DMA2K). This Act (Public Law 106-390) signed into law on October 30, 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The Act attempts to stem the losses from disasters, reduce future public and private expenditures, and to speed up response and recovery from disasters. The following is a summary of the Act that pertains to local governments and tribal organizations.

- The Act establishes a new requirement for local governments and tribal organizations to prepare an All-Hazard Mitigation Plan in order to be eligible for funding from FEMA through the Pre-Disaster Mitigation Assistance Program and Hazard Mitigation Grant Program.
- The Act establishes a requirement that natural hazards such as tornadoes, floods, wildfires need to be addressed in the risk assessment and vulnerability analysis parts of the All Hazard Mitigation Plan. Manmade hazards such as hazardous waste spills are encouraged but not required to be addressed.
- The Act authorizes up to seven percent of Hazard Mitigation Grant Program funds available to a state after a federal disaster to be used for development of state, local, and tribal organization All Hazard Mitigation Plans.
- The Act establishes November 1, 2004 as the date by which local governments and tribal organizations are to prepare and adopt their respective plans in order to be eligible for FEMA Hazard Mitigation Grant Program and November 1, 2003 Pre-Disaster Mitigation Program.
- If a plan is not prepared by November 1, 2004, and a major disaster is declared, in order for a local government or tribal organization to be eligible to receive funding through the Hazard Mitigation Grant Program, they must agree to prepare an All Hazards Mitigation Plan within one year.
- In addition, by not having an All Hazard Mitigation Plan, local governments and tribal organizations cannot utilize funding through the Pre-Disaster Mitigation Grant Program.

Plan Committees and Organizations

The Vernon County Multi-Hazards Mitigation Plan 2012-2016 included all local units of government and organizations that desired to participate in it. This update of that plan will also include all local units of government and organizations that desire to participate. This includes the county along with the Towns of Bergen, Christiana, Clinton, Coon, Forest, Franklin, Genoa, Greenwood, Hamburg, Harmony, Hillsboro, Jefferson, Kickapoo, Liberty, Stark, Sterling, Union, Viroqua, Webster, Wheatland, Whitestown, the Villages of Chaseburg, Coon Valley, De Soto, Genoa, La Farge, Ontario, Readstown, Stoddard, Viola and the Cities of Hillsboro, Viroqua and Westby. The update of the plan was prepared under the guidance of the County Emergency Management Committee due to their familiarity with flooding issues and floodplain management. Members of this committee and who they represent are: Dennis Brault, Towns of Webster and Viroqua; Glenda Sullivan, Town of Whitestown and Village of Ontario; Cary Joholski, Towns of Coon & Hamburg and the Village of Coon Valley; David Eggen, Town of Town of Christiana and part of the City of Westby and Kay Stanek, Parts of the Town and City of Hillsboro. The County Emergency Management Director also participated in committee meetings and served as a liaison between the County Emergency Management Committee and other local units of government in the County. The County, being a member of the Mississippi River Regional Planning Commission, contracted with them to facilitate the updating of the plan under the direction of the County Emergency Management Director.

County Departments

Meetings were held with the Land Conservation, Zoning, Highway and Health Departments to explain the plan updating process and to get those departments to review the mitigation projects listed and to update/add to that list.

Public Involvement

The County used three surveys, committee meetings, a special public risk assessment and project identification public meeting, a public hearing and news releases as methods to garner public input into the plan. See Table 1-1 for a listing of the representatives who received surveys. In addition, a draft of the updated plan was sent to adjacent counties for their review and comments.

Surveys. To ensure the opportunity for inclusion of all municipalities and organizations into the planning process a risk assessment survey was mailed to all village presidents, town chairmen, mayors, county supervisors, chiefs of police, the county sheriff and fire chiefs. A listing of who received this survey can be found in Table 1-1 on page 1-3. This risk assessment survey asked the respondents to rank 24 natural hazards and 2 manmade hazards on a high, medium or low basis based on their opinion of a given hazards probable threat to their community's health and public safety. The survey also asked the respondents for suggestions on projects or programs

that they perceive as being needed to reduce future losses from the various hazards. The results of this survey can be found on Tables 3-1 and 3-3. A copy of this survey can be found in Appendix A.

In addition to the risk assessment survey every municipality within Vernon County was mailed in April 2017 a copy of their hazard mitigation projects list from the first plan. Each municipality was asked to update this listing by striking out those projects which have been completed and adding new projects to be included in the updated plan. Also, a hazard mitigation project identification survey was mailed to all county supervisors, chiefs of police, the county sheriff, fire chiefs, the county zoning administrator and the county land conservation coordinator. A listing of who received this survey can be found in Table 1-2 on page 1-4 and a copy of the survey can be found in Appendix B. Due to flooding during the development of this update a second hazard mitigation survey was mailed in October 2018. The projects identified through this process as well as others are listed in Chapter 4.

Emergency Management Committee Meetings

During the course of the period in which the plan was being developed the County Emergency Management Committee included the Multi-Hazards Mitigation Plan Update on their agenda at various times. These meetings are open to the public and input from the public was accepted at these meetings. A copy of an Emergency Management Committee meeting agenda can be found in Appendix C.

Public Meetings and Hearings

The County held a public hearing on November 7, 2018 to present a draft of the updated plan and to receive public comments on the draft. The public was notified of the public hearings through a Class Two notice in the County's official newspaper, the Vernon County Broadcaster. Due to significant flooding in August of 2018, each municipality was sent a notification of the public hearing. A copy of the public notice can be found in Appendix C. Comments regarding the plan were taken at the public hearing and for 2 weeks after the hearing. Comments were then incorporated into the plan.

Municipal and Business Participation. All local municipalities were mailed the risk assessment surveys. The municipalities receiving the survey were the Towns of Bergen, Christiana, Clinton, Coon, Forest, Franklin, Genoa, Greenwood, Hamburg, Harmony, Hillsboro, Jefferson, Kickapoo, Liberty, Stark, Sterling, Union, Viroqua, Webster, Wheatland, Whitestown, the Villages of Chaseburg, Coon Valley, De Soto, Genoa, La Farge, Ontario, Readstown, Stoddard, Viola and the Cities of Hillsboro, Viroqua and Westby. In addition of these municipalities were mailed their project listing from the first plan and were asked to update this list. A second survey was mailed out to these same municipalities regarding mitigation projects in October 2018 due to severe flooding. See Table 1-3 on page 1-5 for a listing of who responded to these surveys. And lastly all these municipalities were asked to approve the updated plan by resolution. In order to accomplish this each municipality is required by law to have the adoption of the resolution as an agenda item for their board meeting. In an effort to get local business input a draft of the plan was sent to the Vernon Economic Development Association and the Viroqua Chamber of Commerce for their review and comments.

Neighboring Communities, Academia and Nonprofits Participation. Emergency Management Directors of neighboring Counties were sent copies of the draft plan for their review and comments. The De Soto, Hillsboro, Kickapoo Area, La Farge, Viroqua and Westby school districts were sent copies of the draft for their review and comment. Nonprofit organizations were given the opportunity to participate in the public hearings as these were notified through Class Two notices.

MRRPC Bimonthly Meetings

During this plan update and continuing until the final approval from FEMA, the Vernon County Multi-Hazards Mitigation Plan update was an agenda item at every MRRPC Bimonthly meeting. These bimonthly meetings, which are announced through the press and direct mailings, are open to the public. Commissioners, the public, and other interested parties were updated as to the progress of the plan and their comments and suggestions were accepted. A copy of a MRRPC Bimonthly meeting agenda can be found in Appendix C.

Funding for the Vernon County Multi-Hazards Mitigation Plan

In February 2017, the County was awarded a Federal Emergency Management Agency grant in the amount of \$259,793.98 to update to their Multi-Hazards Mitigation Plan and complete countywide parcel mapping. Of this grant amount, \$39,754.98 is directed to the updating of the Multi-Hazard Mitigation Plan. A requirement of the grant is a 25% local match. In April 2017, the Mississippi River Regional Planning Commission signed a contract with Vernon County that called for the MRRPC to prepare

the plan and provide most of the local matching share for the portion of the grant directed toward updating the mitigation plan. The Vernon County Land Information Office will be providing the required local match for the parcel mapping portion of the grant through an in-kind match.

Incorporated Plans, Studies, Reports and Technical Data

The following is a list of plans, studies and reports that were used to assist in preparing this plan.

Plan Name	How used
Hazard Analysis for the State of Wisconsin, November 2008	Provided data for historical natural hazard events.
State of Wisconsin Hazard Mitigation Plan 2016	Provided dates and amounts of damage for the various natural hazards
National Climatic Data Center	Provided data for history and damage amounts for the various natural hazards
Hazard Analysis and Mitigation, Vernon County	Provided data for on the history and damage amounts for the various natural hazards and provided a source of mitigation projects
Wisconsin Department of Natural Resources Dam Database	Provided list of dams within Vernon County
Wisconsin Department of Administration, Hazard Material Site Database	Provided a list of hazardous material sites located within the County

Plan Contents

In order to meet FEMA's local mitigation plan requirements Vernon County's Multi-Hazard Mitigation Plan is organized into the following five parts which also follow the Resource Guide to All Hazard Mitigation Planning in Wisconsin.

- | | |
|-----------------------------------|-------------------------|
| (1) Planning Process | (2) Planning Area |
| (3) Risk Assessment | (4) Mitigation Strategy |
| (5) Plan Maintenance and Adoption | |

Updated Items

During this update each of the chapters of the old plan were reviewed and updated. The following items were updated during this process:

- Chapter 1: Vernon County Emergency Management Committee members were listed; survey information was updated and the table identifying who received surveys was updated;
- Chapter 2: Population, housing and land use tables were updated;
- Chapter 3: Updated risk assessments, historical data, vulnerability data (to include data from 2009-2017), 100-year floodplain data, flood potential, updated critical facilities tables and maps and added river cargo and trail derailment information;
- Chapter 4: Updated mitigation projects lists by identifying completed projects and adding new projects;
- Chapter 5: Reviewed maintenance schedule and updated list of municipalities which have approved the plan.

Plan Contact Information

For further information pertaining to this plan contact:
 Brandon Larson, Emergency Management Director
 Erlandson Office Building
 318 Fairlane Drive, Suite 5
 Viroqua, WI 54665

Table 1-1
Risk Assessment Survey Mailing List

Name	Title
Jeff Cermak	Bergen Town Chairman
David Eggen	Christiana Town Chairman
John LaDue	Clinton Town Chairman
Orlan Bakkum	Coon Town Chairman
Mark Davison	Forest Town Chairman
Berent Froiland	Franklin Town Chairman
Steve Nickelotti	Genoa Town Chairman
Joe Nusse	Greenwood Town Chairman
Rod Erlandson	Hamburg Town Chairman
Lorn Goede	Harmony Town Chairman
James Stekel	Hillsboro Town Chairman
Don Langaard	Jefferson Town Chairman
Jeff Clements	Kickapoo Town Chairman
Terry Theis	Liberty Town Chairman
Keith Ashley-Wright	Stark Town Chairman
Kevin Walleser	Sterling Town Chairman
Elgin Fanta	Union Town Chairman
Phil Hewitt	Viroqua Town Chairman
John Young	Webster Town Chairman
Phillip Tegen	Wheatland Town Chairman
Jim Lee	Whitestown Township Chairman
Kenneth Bluske	Chaseburg Village President
Karl Henrichsen	Coon Valley Village President
Joel Greiner	DeSoto Village President
Richard Phillips	Genoa Village President
Greg Lawton	La Farge Village President
Mark Smith	Ontario Village President
Chad Larson	Readstown Village President
Robert Wurtzel	Stoddard Village President
Eugene Gabrysiak	Viola Village President
Adam Sonntag	Administrator, City of Hillsboro
Karen Mischel	Mayor, City of Viroqua
Danny Hegerson	Mayor, City of Westby
Dennis Dickman	Cashton First Responders
Russ Cornford	Coon Valley First Responders
James Reed	Police Chief, Village of Viola

Name	Title
Chris Mussatti	DeSoto First Responders
Kevin Dean	EMS Liaison-Vernon County
Barry Witmer	Hillsboro Ambulance
Steve McCauley	Kickapoo Rescue Squad
Skip Oliphant	LaFarge Ambulance
Ashley Thieman	Ontario Ambulance
Scott Wilson	Readstown Ambulance
Joe Pfaff	Stoddard First Responders & Fire Chief
Tom Tornstrom	Tri-State Ambulance
Gilbert Turben	Westby First Responders
Scott Yaun	Wheatland First Responders
Jeannie Urbanek	Yuba First Responders
Dennis Dickman	Fire Chief, Cashton Fire Department
Russ Cornford	Fire Chief, Coon Valley Fire Department
Chris Mussatti	Fire Chief, De Soto Fire Department
Mike Hanson	Fire Chief, Genoa Fire Department
Mike Clark	Fire Chief, Hillsboro Fire Department
Philip Sittleburg	Fire Chief, La Farge Fire Department
Kevin Knoll	Fire Chief, Ontario Fire Department
Mitch Mabb	Fire Chief, Readstown Fire Department
Jeff Liska	Fire Chief, Viola Fire Department
Chad Buros	Fire Chief, Viroqua Fire Department
Gilbert Turben	Fire Chief, Westby Fire Department
Jim Huffman	Fire Chief, Yuba Fire Department
David Hobbs	Fire Chief, Wheatland Fire Department
Philip Welch	Police Chief, Village of Coon Valley
Timothy Gratz	Police Chief, Village of Readstown
Daron Jefson	Police Chief, City of Viroqua
Todd Simonson	Assistant Police Chief, City of Viroqua
Pat Clark	Police Chief, City of Hillsboro
Jonathon Brown	Police Chief, Village of La Farge
Philip Welch	Police Chief, Village of Ontario
John Spears	Vernon County Sheriff
Nate Campbell	Chief Deputy, Vernon County
David Jefson	Police Chief, City of Westby

Table 1-2
Projects Needs Survey Mailing List

Name	Title
Jeff Cermak	Bergen Town Chairman
David Eggen	Christiana Town Chairman
John LaDue	Clinton Town Chairman
Orlan Bakkum	Coon Town Chairman
Mark Davison	Forest Town Chairman
Berent Froiland	Franklin Town Chairman
Steve Nickelotti	Genoa Town Chairman
Joe Nusse	Greenwood Town Chairman
Rod Erlandson	Hamburg Town Chairman
Lorn Goede	Harmony Town Chairman
James Stekel	Hillsboro Town Chairman
Don Langaard	Jefferson Town Chairman
Jeff Clements	Kickapoo Town Chairman
Terry Theis	Liberty Town Chairman
Keith Ashley-Wright	Stark Town Chairman
Kevin Walleser	Sterling Town Chairman
Elgin Fanta	Union Town Chairman

Name	Title
Phil Hewitt	Viroqua Town Chairman
John Young	Webster Town Chairman
Phillip Tegen	Wheatland Town Chairman
Jim Lee	Whitestown Town Chairman
Kenneth Bluske	Chaseburg Village President
Karl Henrichsen	Coon Valley Village President
Joel Greiner	De Soto Village President
Richard Phillips	Genoa Village President
Greg Lawton	La Farge Village President
Mark Smith	Ontario Village President
Chad Larson	Readstown Village President
Robert Wurtzel	Stoddard Village President
Eugene Gabrysiak	Viola Village President
Adam Sonntag	Administrator, City Hillsboro
Karen Mischel	Mayor, City Viroqua
Danny Hegerson	Mayor, City Westby

**Table 1-3
Municipal Surveys Results**

Municipality	Risk Assessment Survey			Mitigation Projects Survey		
	Received Survey	Returned Survey		Received Survey	Mailed Survey Back	Replied by individual meeting or phone conference
T. Bergen	X	X		X	X	
T. Christiana	X	X		X	X	
T. Clinton	X	X		X	X	
T. Coon	X	X		X	X	
T. Forest	X	X		X	X	
T. Franklin	X			X		
T. Genoa	X	X		X	X	
T. Greenwood	X	X		X	X	
T. Hamburg	X			X		
T. Harmony	X			X		
T. Hillsboro	X	X		X	X	
T. Jefferson	X	X		X	X	
T. Kickapoo	X			X		
T. Liberty	X			X		
T. Stark	X	X		X	X	
T. Sterling	X			X		
T. Union	X	X		X	X	
T. Viroqua	X	X		X	X	
T. Webster	X	X		X		
T. Wheatland	X	X		X	X	
T. Whitestown	X			X		
V. Chaseburg	X			X		X
V. Coon Valley	X			X		X
V. De Soto	X	X		X	X	
V. Genoa	X	X		X	X	
V. La Farge	X			X		X
V. Ontario	X			X		X
V. Readstown	X	X		X	X	
V. Stoddard	X	X		X	X	
V. Viola	X	X		X	X	
C. Hillsboro	X	X		X	X	
C. Viroqua	X	X		X	X	
C. Westby	X	X		X	X	

2.0 VERNON COUNTY PLANNING AREA

General Geography

The planning area for this Multi-Hazards Mitigation plan is all of Vernon County. Vernon County is located in southwest Wisconsin and is bordered by the Mississippi River on the west, La Crosse County and Monroe County to the north, Crawford County to the south, Juneau County and Sauk County to the east, and Richland County to the southeast, Map 1. The total land and water area in the county totals approximately 820 square miles. The largest city in land area in the county is Viroqua, with an area of 3.3 square miles. The smallest city in land area is Hillsboro, with 1.2 square miles. Readstown is the largest village in land area, with 1.8 square miles. The town with the largest land area is Bergen, which covers 52.8 square miles. There are 3 cities, 9 villages, and 21 town governments in the County. Land is also owned by the Bureau of Indian Affairs held in trust for the Ho Chunk Nation in the Kickapoo Valley. Table 2-1 provides land area, population and housing data on all the units of government in the County.

Driftless Area

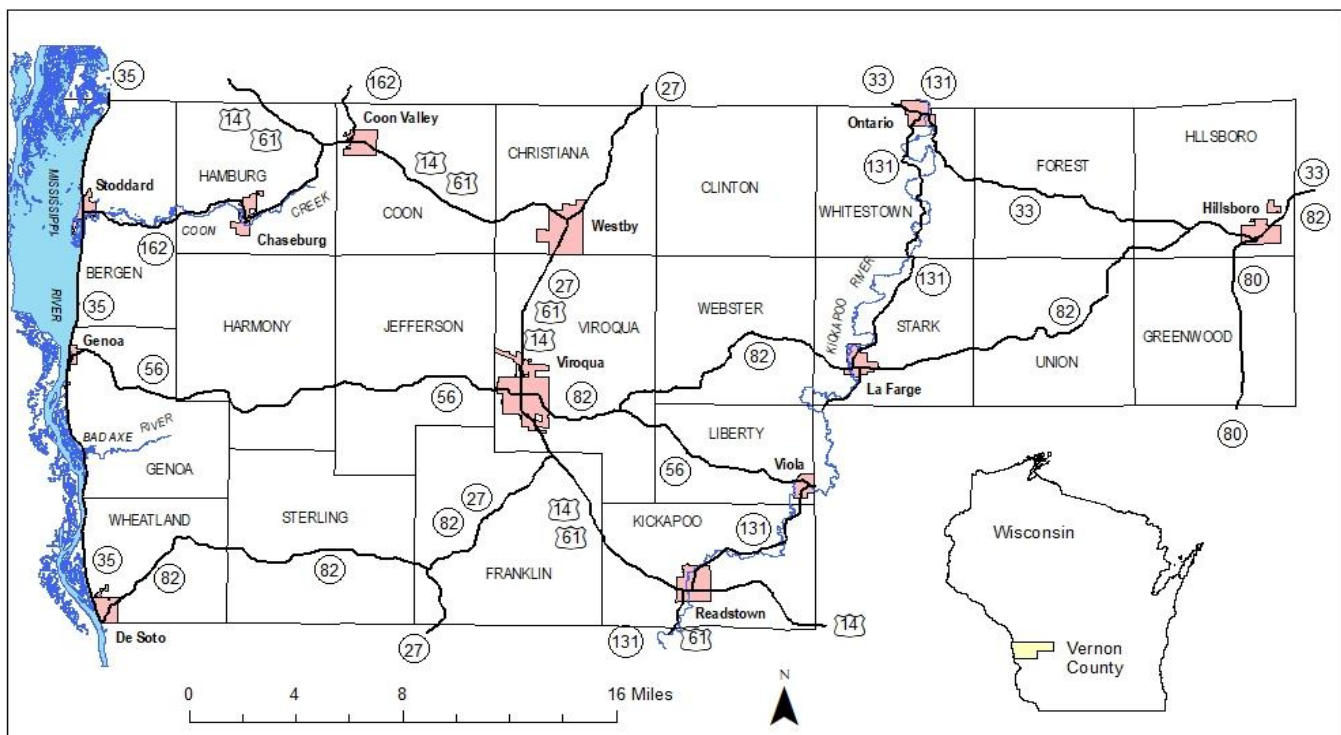
The driftless area, an area covering 15,425,920 acres or 24,103 square miles covers all or part of 57 counties in southeast

Minnesota, southwest Wisconsin, northeast Iowa and a small portion of northwest Illinois in the Upper Mississippi River Basin. Vernon County is part of this unique area, an area that was bypassed by the last continental glacier some 10,000 years ago resulting in a steep, rugged landscape. The area is characterized by karst topography with shallow limestone bedrock, caves and sinkholes.

County Landscape

Vernon County's landscape is inundated with steep sided valleys heavily forested with hardwoods. Elevation changes from valley floor to ridge top average 300-400 feet. Agricultural activities, primarily dairy and beef farming, are confined to the valley floors and ridge tops. Large and small meandering rivers and streams are also a characteristic.

The most striking topographic features in the County are along the Mississippi and Kickapoo Rivers. The Mississippi River makes up the County's western border coast with its steep limestone cliffs interspersed with forested bluffs and goat prairies. The Kickapoo River traversing the County north to south is considered one of the best canoe rivers in Wisconsin.



Demographic and Economic Profile

Population. Vernon County experienced a growth in population from 29,773 in 2010, to an estimated 30,112 in 2017, a 1.1 percent increase. This rate of growth was lower than both the State (1.7%) and the Nation (5.5), Table 2-1. City populations range from 1,399 in Hillsboro to 4,385 in Viroqua. Village populations range from 242 in Genoa to 803 in Stoddard. Town populations range from 264 in Liberty to 1,749 in Viroqua. The fastest growing city from 2010-2017 was Westby, which grew 0.8 percent. The fastest growing village from 2010-2017 was Stoddard, which grew 3.7 percent. The fastest growing towns from 2010-2017 were Stark, Harmony and Kickapoo, which grew 5.5%, 5.4% and 5.1% respectively, Table 2-1.

Table 2-1
Vernon County Population and Land Area Data

Jurisdiction	Population				Land Area (Sq.Miles)		
	2010	2017	# Change 10-17	% Change 10-17	Land	Water	Total
T. Bergen	1,364	1,366	2	0.1	34.22	18.57	52.79
T. Christiana	931	946	15	1.6	33.57	0.08	33.66
T. Clinton	1,358	1,397	39	2.9	35.88	0.01	35.89
T. Coon	728	746	18	2.5	34.85	0.00	34.85
T. Forest	634	648	14	2.2	35.96	0.00	35.96
T. Franklin	1,140	1,169	29	2.5	51.54	0.04	51.59
T. Genoa	789	804	15	1.9	34.99	1.33	36.33
T. Greenwood	847	841	-6	-0.7	35.80	0.00	35.80
T. Hamburg	973	982	9	0.9	35.81	0.01	35.82
T. Harmony	755	796	41	5.4	42.90	0.00	42.90
T. Hillsboro	807	812	5	0.6	35.61	0.03	35.64
T. Jefferson	1,143	1,166	23	2.0	46.93	0.09	47.01
T. Kickapoo	626	658	32	5.1	37.86	0.03	37.89
T. Liberty	252	264	12	4.8	23.05	0.01	23.06
T. Stark	363	383	20	5.5	34.42	0.01	34.43
T. Sterling	633	613	-20	-3.2	45.45	0.00	45.45
T. Union	700	720	20	2.9	35.76	0.00	35.77
T. Viroqua	1,718	1,749	31	1.8	48.34	0.03	48.37
T. Webster	778	808	30	3.9	35.41	0.01	35.42
T. Wheatland	561	581	20	3.6	26.52	1.10	27.62
T. Whitestown	502	510	8	1.6	35.01	0.00	35.01
Town Totals	17,602	17,959	357	2.0	779.90	21.37	801.27
V. Chaseburg	284	288	4	1.4	0.62	0.00	0.62
V. Coon Valley	765	749	-16	-2.1	1.08	0.00	1.08
V. De Soto (Pt.)*	179	182	3	1.7	0.99	0.05	1.04
V. Genoa	253	242	-11	-4.3	0.30	0.00	0.30
V. La Farge	746	699	-47	-6.3	1.04	0.00	1.04
V. Ontario	554	549	-5	-0.9	1.01	0.00	1.01
V. Readstown	415	415	0	0.0	1.79	0.00	1.79
V. Stoddard	774	803	29	3.7	0.60	0.09	0.69
V. Viola (Pt.) *	222	224	2	0.9	0.65	0.00	0.65
C. Hillsboro	1,417	1,399	-18	-1.3	1.20	0.03	1.23
C. Viroqua	4,362	4,385	23	0.5	3.27	0.00	3.27
C. Westby	2,200	2,218	18	0.8	2.43	0.00	12.71
City Totals	12,171	12,153	-18	-0.1	14.97	0.17	15.14
Vernon County	29,773	30,112	339	1.1	794.87	21.54	816.41
Wisconsin	5,686,986	5,783,278	96,292	1.7	54,310	11,888	65,498
United States	308,748,538	325,719,178	16,970,640	5.5	3,537,422	181,272	3,718,694

*Part of the Village of DeSoto is located in Crawford County and part of the Village of Viola is located in Richland County

Source: 1) 2010 Populations: U.S. Department of Commerce-Bureau of the Census

2) 2017 Population Estimates: State of Wisconsin-Department of Administration, Demographic Services Center

3) Vernon County and Jurisdictions Land/Water Area: State of Wisconsin-Department of Administration, Demographic Services Center

4) Wis. and U.S. Land/Water Area: U.S. Census Bureau, 2000 Census of Population and Housing, Summary Population and Housing Characteristics

Housing. Between the years 2010 to 2016 the percent of housing growth in Vernon County was lower than both the State and Nation. The number of housing units in the County increased from 13,720 in 2010, to 13,807 in 2016, an increase of 0.6 percent. The percentage increases for the State of Wisconsin and the Nation was 1.0% and 1.8% respectively. The City of Viroqua with 2,252 housing units in 2016 had the most housing units of any community. The municipality with the largest percentage increase from 2010-2016 was the Town of Webster, with a 22.1 percent increase in housing units, See Table 2-2.

Table 2-2
Vernon County Housing and Housing Units Per Square Mile

Jurisdiction	Housing Units				Housing Units Per Sq. Mile of Land Area			
	2010	2016	Number Change 10-16	Percent Change 10-16	2010	2016	Number Change 10-16	Percent Change 10-16
T. Bergen	603	587	-16	-2.7	17.6	17.2	-0.5	-2.7
T. Christiana	383	386	3	0.8	11.4	11.5	0.1	0.8
T. Clinton	371	372	1	0.3	10.3	10.4	0.0	0.3
T. Coon	322	325	3	0.9	9.2	9.3	0.1	0.9
T. Forest	301	322	21	7.0	8.4	9.0	0.6	7.0
T. Franklin	470	469	-1	-0.2	9.1	9.1	0.0	-0.2
T. Genoa	401	418	17	4.2	11.5	11.9	0.5	4.2
T. Greenwood	285	298	13	4.6	8.0	8.3	0.4	4.6
T. Hamburg	371	418	47	12.7	10.4	11.7	1.3	12.7
T. Harmony	308	315	7	2.3	7.2	7.3	0.2	2.7
T. Hillsboro	363	374	11	3.0	10.2	10.5	0.3	3.0
T. Jefferson	484	473	-11	-2.3	10.3	10.1	-0.2	-2.3
T. Kickapoo	319	337	18	5.6	8.4	8.9	0.5	5.6
T. Liberty	180	181	1	0.6	7.8	7.9	0.0	0.6
T. Stark	224	201	-23	-10.3	6.5	5.8	-0.7	-10.3
T. Sterling	294	277	-17	-5.8	6.5	6.1	-0.4	-5.8
T. Union	284	260	-24	-8.5	7.9	7.3	-0.7	-8.5
T. Viroqua	703	693	-10	-1.4	14.5	14.3	-0.2	-1.4
T. Webster	380	464	84	22.1	10.7	13.1	2.4	22.1
T. Wheatland	472	417	-55	-11.7	17.8	15.7	-2.1	-11.7
T. Whitestown	267	273	6	2.2	7.6	7.8	0.2	2.2
Town Totals	7,785	7,860	75	1.0	10.0	10.1	0.1	1.0
V. Chaseburg	126	146	20	15.9	202.7	234.9	32.2	15.9
V. Coon Valley	348	310	-38	-10.9	322.2	287.0	-35.2	-10.9
V. De Soto (Pt.) *	115	138	23	20.0	116.5	139.8	23.3	20.0
V. Genoa	120	113	-7	-5.8	398.1	374.8	-23.2	-5.8
V. La Farge	375	349	-26	-6.9	360.7	335.7	-25.0	-6.9
V. Ontario	253	225	-28	-11.1	249.9	222.2	-27.7	-11.1
V. Readstown	213	212	-1	-0.5	119.2	118.6	-0.6	-0.5
V. Stoddard	388	404	16	4.1	647.7	674.4	26.7	4.1
V. Viola (Pt.) *	131	131	0	0.0	202.7	202.7	0.0	0.0
C. Hillsboro	662	666	4	0.6	552.5	555.8	3.3	0.6
C. Viroqua	2,208	2,252	44	2.0	676.0	689.5	13.5	2.0
C. Westby	996	1,001	5	0.5	410.0	412.1	2.1	0.5
City Totals	5,935	5,947	12	0.2	396.5	397.3	0.8	0.2
Vernon County	13,720	13,807	87	0.6	17.3	17.4	0.1	0.6
Wisconsin	2,624,358	2,649,597	25,239	1.0	48.3	48.8	0.5	1.0
United States	131,704,730	134,054,899	2,350,169	1.8	37.2	37.9	0.7	1.8

*Part of the Village of DeSoto is located in Crawford County and part of the Village of Viola is located in Richland County

Source: U.S. Department of Commerce-Bureau of the Census

Employment and Industry.

Employment for those aged 16 and older in the County decreased from 13,816 employees in 2010 to 13,375 employees in 2016 a decrease of 3.2 percent. This decrease in employment is in contrast to both the State (1.4%) and the Nation (4.3%) which experienced increases of 1.4% and 4.3% respectively. The top three employment sectors in the County in 2016 were Educational, Health and Social Services (24.7%), Manufacturing (16.1%), and Retail trade (11.2%). The only employment sectors which experienced growth during this time period were: Professional, scientific, management, administrative, and waste management services; Information; Other services (except Public Administration); Finance, insurance, real estate, and rental and leasing; and Manufacturing. See Table 2-3.

Table 2-3
Employment by Industry

	Vernon County					Wisconsin					United States				
	2010 ⁽¹⁾		2016 ⁽²⁾		% Change 00-10	2000 ⁽¹⁾		2010 ⁽²⁾		% Change 00-10	2000 ⁽¹⁾		2010 ⁽²⁾		% Change 00-10
	No. Emp.	%	No. Emp.	%		No. Emp.	%	No. Emp.	%		No. Emp.	%	No. Emp.	%	
Agriculture, forestry, fishing and hunting, and mining	764	10.8	1,115	7.4	-27.5	71,684	2.5	71,071	2.4	-0.9	2,634,188	1.9	2,843,703	1.9	8.0
Construction	629	8.9	1,018	7.0	-16.5	171,616	6.0	155,081	5.3	-9.6	10,115,885	7.1	9,256,637	6.3	-8.5
Manufacturing	1,463	20.6	2,158	17.7	-9.0	536,934	18.7	536,806	18.4	0.0	15,581,149	11.0	15,316,355	10.3	-1.7
Wholesale trade	196	2.8	473	1.5	-43.4	86,908	3.0	77,724	2.7	-10.6	4,344,743	3.1	3,993,420	2.7	-8.1
Retail trade	633	8.9	1,493	17.4	106.8	329,863	11.5	330,945	11.4	0.3	16,293,522	11.5	17,027,853	11.5	4.5
Transportation and warehousing, and utilities	607	8.5	636	5.0	-38.1	130,387	4.5	124,870	4.3	-4.2	7,183,901	5.1	7,411,283	5.0	3.2
Information	134	1.9	226	1.1	-36.6	56,076	2.0	47,931	1.6	-14.5	3,368,676	2.4	3,131,838	2.1	-7.0
Finance, insurance, real estate, and rental and leasing	454	6.4	528	3.7	-39.0	182,526	6.4	177,499	6.1	-2.8	9,934,900	7.0	9,731,609	6.6	-2.0
Professional, scientific, management, administrative, and waste management services	286	4.0	725	3.9	1.7	218,788	7.6	236,958	8.1	8.3	14,772,322	10.4	16,516,075	11.2	11.8
Educational, health and social services	1,224	17.2	3,304	19.3	18.5	631,818	22.0	677,098	23.3	7.2	31,277,542	22.1	34,202,980	23.1	9.4
Arts, entertainment, recreation, accommodation and food services	308	4.3	763	7.5	82.1	238,223	8.3	252,787	8.7	6.1	12,566,228	8.9	14,316,298	9.7	13.9
Other services (except public administration)	219	3.1	563	3.4	16.0	115,426	4.0	120,714	4.1	4.6	6,899,223	4.9	7,275,839	4.9	5.5
Public Administration	187	2.6	373	5.4	127.6	99,061	3.5	100,855	3.5	1.8	6,864,046	4.8	6,977,436	4.7	1.7
Total Employees	7,104	100	13,375		6.0	2,869,310	100	2,910,339		1.4	141,836,325	100	148,001,326		4.3

⁽¹⁾ Census 2010, Profile of Selected Economic Characteristics

⁽²⁾ 2012-2016 American Community Survey 5-Year Estimates, Industry by Occupation for the Civilian Employed Population 16 Years and over

Top Industries by Employment

According to Wisconsin Department of Workforce Development the top industries by employment for the 2nd quarter of 2017 were the following:

- Education & Health
- Transportation and Warehousing and Utilities
- Manufacturing
- Leisure & Hospitality
- Professional & Business Services

General Development Pattern

Land Use Trends. Real estate assessment records from 2012 to 2017 provide the most current land use information for the County. In 2017 Agricultural land totaled 275,070 acres or 66.3 percent of land use in the County. This was followed by Agricultural Forest 59,265 acres – 14.3%, Undeveloped, 33,547 acres – 8.1%; Forest, 24,833 acres – 6.0%; Residential, 14,446 acres – 3.5%; Other 5,462 acres – 1.3%; Commercial, 1,479 acres – 0.4%; and Manufacturing, 626 acres – 0.1%. The rural nature of the County is clearly indicated with 86.6 percent of the land being used for agriculture and forests, Table 2-4.

Agricultural assessed land (Agriculture and Agriculture Forest categories) declined slightly between the years 2012 and 2017 from 277,734 acres to 275,070 acres in 2017 or 1 percent. While the more urban forms of land use, Residential and Commercial increased from 2012 – 2017. Residential land use increased by 803 acres or 5.9 percent and Commercial land use increased by 107 acres or 7.8 percent.

Table 2-4
Vernon County Land Use

	2012		2017	
	Acres	Percent of County	Acres	Percent of County
Residential ⁽¹⁾	13,643	3.2	14,446	3.5
Commercial ⁽¹⁾	1,372	0.3	1,479	0.4
Manufacturing ⁽¹⁾	655	0.2	626	0.1
Agricultural ⁽¹⁾	277,734	66.2	275,070	66.3
Undeveloped ⁽¹⁾	33,675	8.0	33,547	8.1
Agricultural Forest ⁽¹⁾	60,330	14.4	59,265	14.3
Forest ⁽¹⁾	26,796	6.4	24,833	6.0
Other ⁽²⁾	5,295	1.3	5,462	1.3
County Total ⁽³⁾	419,500	100	414,728	100

(1) Wisconsin Department of Revenue - 2012 and 2017 Final Statement of Assessments

(2) Includes water areas but excludes the Mississippi River. Also includes tax exempt lands as identified by the Wisconsin Department of Revenue. These tax-exempt lands include city, village, town, county, state, and federally owned lands as well as: School districts, lake districts, sewer districts, vocational and technical districts, colleges, universities, forest management lands, some non-profit organization lands, cemeteries, and shelters. State Statute 70.11 lists all tax-exempt properties which would be included in this category.

(3) Includes total area of county - both land area and water area but excludes the water area of the Mississippi River. Source: Wisconsin DNR

Housing Development Trends. Between 2010 -2016 there was a slight increase in residential housing. In 2010 there were 13,720 housing units in Vernon County, while there were 13,807 housing units in 2016, an increase of 87 housing units or 0.6 percent (US Census Bureau). Most of the of the increase in housing units came from the Towns, as housing units in the Towns increased by 75. Of the 21 towns 13 experienced an increase while 8 saw a decrease. The Town of Webster saw the largest

increase with 84 new housing units, while the Town of Wheatland saw the biggest decrease with a loss of 55 housing units. The Cities and Villages only increased by 12 housing units. The City of Viroqua had the largest increase with 44 new housing units, while the Village of Coon Valley saw a decrease of 55 units. The number of acres classified as residential increased from 13,643 in 2012 to 14,446 in 2017 an increase of 5.9 percent. Favorable housing market conditions which included low interest rates during the 2000's help to explain the housing units increase.

3.0 VERNON COUNTY RISK ASSESSMENT

The following is Vernon County's assessment of each of the natural hazards identified as occurring in the State of Wisconsin. Each natural hazard is assessed on the historical occurrence of the hazard, the vulnerability to a given hazard, the probability of the hazard occurring again and a local official's opinion survey. A final risk assessment designation of high, moderate or low is then assigned to each hazard based on a total score from ratings within each of these four assessment factors. Each jurisdiction in the county has the same risk to each hazard with the exception of flooding. The cities of Westby and Viroqua do not have a high risk of Riverine or Flash flooding but are susceptible to Stormwater Flooding. See Maps 3-6 and 3-7 for flood prone areas. Vernon County has not experienced a lot of development therefore the vulnerability to the various hazards has not increased or decreased with the exception of flooding. Voluntary buyouts has decreased the flooding hazard in some situations. See "Riverine Flooding" page 3-15.

An overall risk assessment rating of 22 points or greater equates to a "high" risk assessment designation for a given hazard. A risk assessment rating of 15 to 21 points equates to a moderate risk assessment designation and a rating of 14 points or less results in a low risk assessment rating for a given hazard. Table 3-2 provides a summary of the ratings for all the natural hazards.

The following is a description of how the ratings are determined for each assessment and how these ratings result in the final risk assessment designation.

Historical Occurrence Rating Criteria:

Historical occurrence refers to the number of times a particular hazard occurred in the past. Because historical records for the hazards vary greatly each hazard is assessed on occurrences within a 25-year period.

• Less than 4 occurrences in the past 25 years =	Low rating, 1-3 points
• 4 to 7 occurrences in the past 25 years =	Moderately Low rating, 3-5 points
• 8 to 12 occurrences in the past 25 years =	Moderately High rating, 5-7 points
• More than 12 occurrences in the past 25 years =	High rating, 7-9 points

Vulnerability Rating Criteria:

Vulnerability is a measure of how people, buildings, structures, personal property, and other things considered important are adversely affected by a given hazard. Some aspects to help measure the magnitude of vulnerability in the county have been quantified in Tables 3-1 and 3-2. These tables show the maximum extent of vulnerability within the county. The vulnerability of a population, buildings, structures, transportation routes and businesses will vary from one community to another and from one hazard to another.

• Less than 10% of population or property adversely affected =	Negligible rating, 1-3 points
• Ten to less than 25% of population or property adversely affected =	Limited rating, 3-5 points
• Twenty-Five to less than 50% of the population or property adversely affected =	Critical rating, 5-7 points
• More than 50% of the population or property adversely affected =	Catastrophic rating, 7-9 points

Probability Rating Criteria:

Probability rating is a measure of the likelihood and frequency of hazard occurring in the future.

• Less than 1% probability in the next 100 years =	Unlikely rating, 1-3 points
• From 1% and 10% probability in the next year or at least one chance in next 100 years	Possible rating, 3-5 points
• Over 10% to nearly 100% probability in the next year or at least one chance in the next 10 years =	Likely rating, 5-7 points
• Nearly 100% chance in the next year =	Highly Likely rating, 7-9 points

Local Official Hazard Survey Rating Criteria:

In April of 2017 a local official's survey was mailed to county board supervisors, village presidents, town chairman, mayors, chiefs of police, the sheriff, and fire department chiefs in the county. Each county official was asked to rank the county's natural hazards as high, medium, or low regarding their opinion on each hazard's threat to health and public safety.

<ul style="list-style-type: none"> A majority of local officials were of the opinion that this hazard posed a “low” threat to health and public safety in comparison to the 17 other hazards = 	Low rating, 1-3 points
<ul style="list-style-type: none"> A majority of local officials were of the opinion that this hazard posed a “medium” threat to health and public safety in comparison to the other 17 hazards = 	Medium rating, 3-6 points
<ul style="list-style-type: none"> A majority of local officials were of the opinion that this hazard posed a “high” threat to health and public safety in comparison to the other 17 hazards = 	High rating, 6-9 points

Risk Assessment Designation:

The risk assessment designation is determined by adding the rating points assigned from historical occurrences, vulnerability, probability and the local official survey factors. These summations for each hazard are then assigned a low, moderate, or high threat based on numerical rank.

<ul style="list-style-type: none"> A combined risk factor rating of 11 points or less = 	Low Threat
<ul style="list-style-type: none"> A combined risk factor rating of 12 to 22 points = 	Moderate Threat
<ul style="list-style-type: none"> A combined risk factor rating of 23 points or more = 	High Threat

3.1 Vernon County, Hailstorm Risk Assessment

Hailstorm Definition: A hailstorm is a weather condition where atmospheric water particles form into rounded or irregular masses of ice that fall to earth. Hail is a product of strong thunderstorms that frequently move across the state. Hail normally falls near the center of the moving storm along with the heaviest rain; however, the strong winds at high altitudes can blow the hailstones away from the storm center, causing unexpected hazards at places that otherwise might not appear threatened.

Hailstorms normally range from the size of a pea to that of a golf ball, but sizes larger than baseballs have occurred with the most severe storms. They form when subfreezing temperatures cause water in thunderstorm clouds to accumulate around an icy core. When strong underlying winds no longer can support their weight, the hailstones fall earthward. Hail tends to fall in swaths that may be 20-115 miles long and 5-30 miles wide. The swath is not normally a large, continuous bombardment of hail, but generally consists of a series of hail strikes that are produced by individual thunderstorm clouds traversing the same general area. Hail strikes are typically one-half mile wide and five miles long. They may partially overlap, but often leave completely undamaged gaps between them.

Hailstorms are considered formidable among the weather and climatic hazards to property and crops of the interior plains of the U.S. because they dent vehicles and structures, break windows, damage roofs and batter crops to the point that significant agricultural losses result. Serious injury and loss of human life, however, are rarely associated with hailstorms.

Hailstorm History and Frequency:

- 1960's: 2 reported events by National Climatic Data Center (NCDC), 7/15/61, 7/17/63, 1.0-1.75" size hailstorms.
- 1970's: 6 reported events by NCDC, 10/3/73, 8/6/74, 4/17/75, 7/3/75, 8/24/75, 6/5/77, .75 to 1.75" size hailstorms.
- 1980's: 9 reported events by NCDC – 6/5/80, 7/15/80, 9/24/84, 8/12/95, 4/25/86, 5/8/88, 4/24/89, 7/8/89, 8/4/89, .75" to 2.75" size hailstorms
- 1990's: 16 reported events by NCDC – (7/11/94 Esofea), (5/16/95 Coon Valley), (5/18/96 Stoddard-\$2,500 PD/\$600 CD), (7/5/97 Viroqua-\$8,000 CD), (8/3/97 Coon Valley-\$18,000 PD/\$35,000 CD & Viroqua-\$40,000 PD), (5/28/98 Ontario & West Prairie-\$18,000 CD & La Farge-\$25,000 PD & Hillsboro-\$13,500 PD), (6/20/98 Genoa-\$25,000 PD & Viroqua-\$40,000 PD/\$30,000 CD), (6/24/98 Genoa-\$18,000 PD & Westby-\$45,000 PD/\$50,000 CD), (7/20/98 Readstown-\$15,000 CD), (8/14/98 Viroqua-\$25,000 CD), .75" to 2.00" size hailstorms. Damage totals of \$227,000 PD and \$181,600 CD.
- 2000's: 42 reported events by NCDC – (5/12/00 DeSoto-\$10,000 PD), (5/18/00 Genoa & Chaseburg), (5/31/00 Victory-\$5,000 PD/\$10,000 CD), (9/11/00 Hillsboro), (4/6/01 Viroqua), (5/10/01 Stoddard-\$1,000 PD & Coon Valley-\$1,000 PD), (6/11/01 Ontario), (4/18/02 Hillsboro), (5/30/02 Readstown-\$4,000 CD), (7/31/03 De Soto), (5/21/04 Hillsboro, De Soto-\$1,000 PD, Retreat-\$1,000 PD, Liberty Pole & Viroqua-\$1,000 PD), (6/23/04 Victory), (7/19/04 Stoddard), (5/24/06 Hillsboro), (6/6/06 La Farge-\$1,000 PD), (6/25/06 Potts Corner), (7/1/06 Viroqua \$3,000 PD, \$7,000 CD), (8/23/06 Hillsboro-\$115,000 PD, \$200,000 CD), (8/24/06 Genoa & Victory),

(8/25/06 Coon Valley, Viroqua-\$2,000 PD, \$3,000 CD), (5/24/07 Dilly), (9/21/07 Westby), (5/26/08 Folsom), (5/30/08 Stoddard & Westby), (6/07/08 Benders Corners), (6/28/08 Victory, De Soto, Red Mound, Retreat, Coon Valley & Readstown), (7/25/08 Viroqua), (4/24/09 Coon Valley) and (7/23/09 Readstown), 0.75" to 1.75" hail storms. Damage totals of \$140,000 PD & \$222,500 CD.

2010's: 12 reported events by NCDC – (6/6/10 Stoddard), (9/4/12 Genoa, Victory & Red Mound), (4/3/13 Liberty), (7/22/13 Stoddard & Viroqua), (4/12/14 Valley, Hillsboro, La Farge, Westby, Stoddard, & Viroqua), (6/25/14 Hillsboro & Readstown areas), (7/7/14 Dilly), (4/9/15 Newry, Westby & Viroqua), (7/13/15 La Farge, Ross, Liberty), (5/25/16 Sugar Grove-\$5,000 PD & Hillsboro), (3/6/17 La Farge), (7/12/17 La Farge), 0.75" to 1.75" hail storms. Damage totals of \$5,000 PD.

PD = Property Damage and CD = Crop Damage

Wisconsin averages between two to three hail days per year as recorded by National Weather Service stations, although this may not be indicative of the number of hailstorms which occur within a county or larger area during any given hail season. The months of maximum hailstorm frequency are May through September with approximately 85% of hailstorms occurring during this period. Unfortunately, hailstorms are most frequent during the four months of the growing and harvesting seasons for most crops in the state. According to the National Weather Service, about 20% of all severe weather events in Wisconsin are hail events in which hailstones are at least ¾ inch in diameter. Serious hailstorms with hailstones 1.5 inch or larger in diameter are not common.

Between 1990 and the end of 2017 the NCDC reported 70 Hailstorm events. Of these 70 events 14 events resulted in property damage and 13 had crop damage reported. The total property damage reported for the 14 events was \$372,000 and crop damage reported totaled \$407,000 during 13 events. Based upon this historical data when Vernon County experiences a hailstorm large enough to cause property damage or crop damage the average amount of property damage to occur is \$26,500 and the average amount of crop damage is \$31,300. Between 1990 and 2017 Vernon County averaged 2.5 hailstorm events per year. Based upon these averages the county can expect to experience 13 hailstorms within the next 5-year period. If historical trends continue the county can expect that 20% of these storms will be strong enough to cause property damage. This would result in 3 storms strong enough to cause property damage resulting in \$79,500 in property damage. In addition, 20% of the hailstorms would cause crop damage. This would result in 3 storms causing \$93,900 of crop damage during that same 5-year period.

Hailstorm Vulnerability Assessment

- Critical Facilities. In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns hailstorms a risk factor of 24 indicating this natural hazard is a high risk to the county. Critical facilities vulnerability to hailstorms would be limited primarily to damage to the building's roof and windows and would not interrupt services provided by these facilities except in extreme cases. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- Business and Industry. In Vernon County there are 630 businesses and industries that employ 7,123 people, with an annual payroll of approximately \$242 million, see Table 3-6. For most businesses and industries hailstorms pose a moderate hazard risk with damage confined to building roofs and windows. Examples of businesses that are particularly vulnerable to hail damage include car and truck dealerships that display vehicles outdoors, greenhouses, and nurseries that store plants and trees outdoors. Auto dealerships can suffer significant losses to their vehicles.
- Agriculture. In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. Agriculture is a significant part of the county's economy. The overall threat of hailstorm is ranked as high and agricultural crops can sustain significant damage and economic loss from hailstorms. Hailstorms occur most frequently in the county in the months from May through September which coincides with the planting and harvesting of most crops in the county making those crops vulnerable to hailstorms.
- Roads and Highways. Hail damage can occur to any vehicle exposed to elements, whether moving or parked. Hail, although when it is lying on the ground, can cause icing conditions, usually is melted before mitigation action such as sanding, salting, or plowing is done. It can occur in seasons when highway trucks are not setup for snow and ice control.
- Railroads. Hail can cause cessation of rail work crews. Hail can cause damage to windshields and headlight covers of locomotives and Maintenance of Way (M of W) equipment. Hail can cause damage to signal lamp covers. Hail can also cause damage to building roofs.
- Airway. Hail can cause damage to aircraft skin and control surfaces. Such damage may be critical to the safety and integrity of the aircraft and its control. Hail can cause icing and clogging of engines of small planes in flight. Hail can damage runway lighting fixtures.
- Waterways. Hail can damage watercraft windows, lights, instruments and communication devices.

- Municipal Water. In the county there are 20 municipal wells and water systems in operation, see Table 3-11. These facilities vulnerability to hailstorms would be limited to damage to the roofs, windows and electrical service, and would not interrupt services provided by these facilities except in extreme cases.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities vulnerability to hailstorms would be limited to the building roofs, windows and electrical service and would not interrupt services provided by these facilities except in extreme cases.
- Hazardous Material Sites. Hazardous material containers in transport can be broached by any accident to the transport mode caused by hail. Hazardous material in storage has no severe impacts caused directly by hail.

Hail Storm Risk Assessment Designation

Hail Storm Historical Occurrence Rating: High - 9

Hailstorm Vulnerability Rating: Negligible - 2

Hailstorm Probability Rating: Highly Likely - 8

Hailstorm Local Official Survey Rating: Medium - 5

Hail Storm Risk Assessment Designation: **High Threat - 24 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Hailstorm Hazard Mitigation Ideas: • Remove or protect vulnerable attachments such as awnings, antennas and signs on buildings • Replace vulnerable shingles and siding with hail resistant building materials • Protect or relocate essential utility and communication equipment • Provide county residents with public information on hailstorms during severe weather awareness • Promote the purchase of hail insurance • Have at least one highway truck at each shop, with a plow and sander that can easily be quickly mounted to respond to emergency situations • Provide a shed or covered area to store government vehicles if a hail storm is predicted

3.2 Vernon County, Lightning Storm Risk Assessment

Lightning Storm Definition: Lightning is a sudden and violent discharge of electricity from within a thunderstorm due to a difference in electrical charges and represents a flow of electrical current from cloud-to-cloud or cloud-to-ground. Nationally, lightning causes extensive damage to buildings and structures, kills or injures people and livestock, starts untold numbers of forest fires and wildfires and disrupts electromagnetic transmissions.

To the general public lightning is often perceived as a minor hazard. However, lightning-caused damages, injuries and deaths establish lightning as a significant hazard associated with any thunderstorm in any part of the state. Damage from lightning occurs four ways:

- 1) Electrocution/severe shock of humans and animals;
- 2) Vaporization of materials along the path of the lightning strike;
- 3) Fire caused by the high temperatures associated with lightning (10,000-60,000°F); and
- 4) The sudden power surge that can damage electrical/electronic equipment.

Large outdoor gatherings (sporting events, concerts, campgrounds, etc.) are particularly vulnerable to lightning strikes that could result in injuries and deaths. Early warning of lightning hazards, combined with prudent protective actions, can greatly reduce the likelihood of lightning-related injuries and deaths.

Lightning Storm History and Frequency:

2010's: 3 reported events by NCDC – (8/13/10 Springville-\$490,000 PD), (6/19/11 Viroqua Airport-\$5,000 PD) and (8/23/11 Westby-\$2,000 PD).

Wisconsin has a high frequency of property losses due to lightning. Insurance statistics show that two out of every 100 farms are struck by lightning or have a fire that may have been lightning-caused each year. According to National Weather Service reports, Vernon County experienced 3 lightning events between 1982 and 2001 with no injuries and deaths recorded. From 2006 through 2017, 376 people were struck and killed by lightning in the United States. Almost two thirds of the deaths occurred to people

who had been enjoying outdoor leisure activities. June, July, and August are the peak months for lightning activity across the United States and the peak months for outdoor summer activities. As a result, more than 70% of the lightning deaths occurred in the months of June, July, and August.

Lightning Vulnerability Assessment

- **Critical Facilities.** In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns lightning a risk factor of 24 indicating this natural hazard is a high risk to the county. Critical facilities vulnerability to lightning is generally perceived as a minor hazard. The damages caused by lightning to buildings and the potential injuries and deaths resulting from a lightning strike established lightning as a significant hazard associated with any thunderstorm. Lightning can cause electrocution and severe shock in humans, fires in buildings and the sudden power surges resulting from lightning can cause significant damages to a facility's electrical services, and electronic equipment such as computers and motors and communications systems. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- **Business and Industry.** For most business and industries, lightning poses a moderate hazard risk. The damages caused by lightning to buildings and the potential injuries and deaths resulting from a lightning strike established lightning as a significant hazard associated with any thunderstorm. Lightning can cause electrocution and severe shock in humans, fires in buildings and the sudden power surges resulting from lightning can cause significant damages to a business/industries electrical services, and electronic equipment such as computers and motors and communications systems. The manufacturing industry could experience disruptions caused by lightning strikes to their product processes that could result in the company sustaining economic losses.
- **Agriculture.** The overall hazard risk ranking for lightning for agriculture is high. The damages caused by lightning strikes can be a significant hazard because lightning strikes can cause electrocution or severe shock to humans and farm animals, fire risk to buildings and sudden power surges associated with lightning strikes can cause significant damage to electrical services, motors and milking machinery. Workers in fields and animals in open spaces are particularly vulnerable to lightning strikes. Tree plantations are also susceptible to fires caused by lightning strikes.
- **Roads and Highways.** Severe lightning in Wisconsin is invariably accompanied by heavy rains, which can limit visibility for drivers. Lightning can cause trees, or parts of trees, to suddenly fall across the road. Lightning can be a hazard to people who attempt to leave their vehicle at service plazas, etc.
- **Railroads.** Severe lightning can be hazardous to railway track and other workers. Lightning can cause trees, or parts of trees, to suddenly fall across railroad tracks. Lightning can cause electric signals and remote-controlled switches to malfunction. Lightning can cause radio communications outages.
- **Airway.** Lightning can cause malfunction of aircraft communications and navigation devices. Lightning can be hazardous to airport workers and passengers who must access the aircraft by walking across an open field/taxi area.
- **Waterways.** Lightning can be hazardous to workers exposed on decks, or at locks during the storm. Lightning can disrupt electronic devices and communications.
- **Municipal Water.** In the county there are 20 municipal wells and waters systems in operation, see Table 3-11. These facilities vulnerable to lightning would include fire damage to facilities from lightning strikes, damage to a facility's electrical service, electronic equipment and motors. Municipal water service would not be interrupted except in extreme cases.
- **Wastewater Treatment Facilities.** There are 11 wastewater treatment facilities operating in the county, see Table 3-12. These facility's vulnerability to lightning would include fire damage to facilities from lightning strikes, damage to the facilities electrical service, electronic equipment and motors and as a result of power surges, wastewater treatment service would not be interrupted except in extreme cases.
- **Hazardous Material Sites.** The impact of lightning storms on hazardous material is specific to the type of material and its storage or transportation conditions. A lightning strike to a fixed storage building, while having little impact on transportation modes, could start a fire or explosion with the stored hazardous material.

Lightning Storm Risk Assessment Designation

Lightning Storm Historical Occurrence Rating: High - 9

Lightning Storm Vulnerability Rating: Negligible - 2

Lightning Storm Probability Rating: Highly Likely - 7

Lightning Storm Local Official Survey Rating: Medium/High - 6

Lightning Storm Risk Assessment Designation: **High Threat - 24 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Lightning Storm Hazard Mitigation Ideas:

- Communities may use outreach programs to promote awareness of thunderstorm/lightning dangers – for example: consider placing lightning safety tips and/or action plan in game programs, flyers, scorecards etc. and during Severe Weather Awareness Week emphasize issues on weather related disaster preparedness through public education
- Local and state governments can invest in public early warning systems/networks, as well as train people to serve as weather spotters
- Promote establishment of indoor warning systems at all critical facilities and public gathering locations
- When thunder is heard, seek shelter inside the nearest building or enclosed vehicle (e.g., a car, bus or truck). If shelter is not available, avoid trees or tall objects because electricity may be conducted from that object to other nearby objects or persons
- Avoid high ground, water, open spaces and metal objects (golf clubs, umbrellas, fences, tools)
- When indoors, turn off appliances and electronic devices and remain inside until the storm passes
- Surge protection can be installed on critical electronic equipment (*protection devices such as lightning rods and grounding can be installed on critical facilities*)
- Remove taller trees in the vicinity of vulnerable structures
- Specimen trees growing along roadways, or in rest areas or landscaped areas, can be protected by properly installed lightning rods
- Local airports can suspend operations during severe lightning storms
- Major hazardous material storage sites should be protected with properly installed lightning rods

3.3 Vernon County, Thunderstorm Risk Assessment

Thunderstorm Definition: Thunderstorms are severe and violent forms of convection produced when warm moist air is overrun by dry cool air. As the warm air rises *thunderheads* (cumulo-nimbus clouds) form and cause the strong winds, lightning, thunder, hail, and rain associated with these storms. The National Weather Service definition of a *severe thunderstorm* is a thunderstorm event that produces any of the following: downbursts with winds of 58 miles per hour or greater (often with gusts of 74 miles per hour or greater), hail $\frac{3}{4}$ of an inch in diameter or greater, or a tornado.

The thunderheads formed may be a towering mass six miles or more across and 40,000 to 50,000 feet high. It may contain as much as 1.5 million tons of water and enormous amounts of energy that often are released in the form of high winds, excessive rains and three violently destructive natural elements: lightning, tornadoes, and hail.

On the ground directly beneath the storm system, the mature thunderstorm is initially felt as rain, which is soon joined by a strong downdraft. The downdraft spreads out from the cloud in gusting divergent winds and brings a marked drop in temperature. Even where the rain has not reached the ground, this cold air stream flowing over the earth's surface is a warning that the storm's most violent phase is about to mature.

A thunderstorm often lasts no more than 30 minutes in a given location because an individual thunderstorm cell frequently moves between 30 and 50 miles per hour. However, strong frontal systems may spawn more than one squall line composed of many individual thunderstorm cells. Thunderstorms may occur individually, in clusters or as a portion of a large line of storms that may stretch across the entire state. Thus, it is possible that several thunderstorms may affect an area in the course of a few hours.

Severe thunderstorms can cause injury or death and can also result in substantial property damage. They may cause power outages, disrupt telephone service and severely affect radio communications and surface/air transportation, which may seriously impair the emergency management capabilities of the affected jurisdictions.

Thunderstorm History and Frequency:

1960's 3 reported events by NCDC – 5/22/62, 6/8/63, 8/25/65

1970's: 6 reported events by NCDC – 6/20/74, 6/4/75, 8/24/75, 6/13/76, 7/6/77, 5/10/79 (61 knots)

1980's: 10 reported events by NCDC – 7/19/80, 5/17/82, 7/3/83, 7/19/83, 8/7/84, 4/21/85, 7/9/85, 7/29/87, 7/24/88, and 8/4/89. Magnitude of winds for these events ranged from 52 knots to 78 knots.

1990's: 43 reported events by NCDC – 4/27/90, 8/26/90, 4/8/91, 7/7/91, (7/11/94 Esofea & Viola-\$50,000 PD/\$50,000 CD & Ontario-\$5,000 CD & Hillsboro-\$5,000 CD), (7/19/94 Westby), (5/16/95 Westby-\$30,000 PD), (6/7/95 Viroqua-\$40,000 PD & Hillsboro-\$20,000 PD), (6/24/95 Bloomingdale), (7/27/95 Viroqua), (6/16/96 La Farge-\$10,000 PD/\$15,000 CD), (6/29/96 Genoa & Westby-\$30,000 PD), (8/7/96 La Farge-\$4,000 PD), (4/5/97 De Soto-\$7,00 PD & Romance-\$13,000 PD & Westby \$1,000 PD), (6/15/97 De Soto-\$20,000 PD & Victory-\$4,000 PD & Newry-\$35,000 PD), (7/26/97 Viroqua-\$10,000 PD & Ontario-\$22,000 PD), (5/19/98 Viroqua-\$5,000 PD), (5/30/98 Genoa-\$8,000 PD), (5/31/98 Viroqua-\$30,000 PD/\$15,000 CD & De Soto-\$25,000 PD), (6/18/98

Westby-\$60,000 PD), (6/20/98 Retreat-\$15,000 PD & Viroqua), (6/27/98 Stoddard-\$400,000 PD/\$53,000 CD & Viroqua-\$35,000 PD/\$10,000 CD & Newry-\$120,000 PD/\$30,000 CD & Hillsboro-\$90,000 PD/\$33,000 CD & Viroqua), (6/8/99 Stoddard-\$27,000 PD & Coon Valley-\$10,000 PD), (6/10/99 Genoa-\$20,000 PD), (7/8/99 Viroqua-\$10,000 PD/\$10,000 CD & Ontario-\$1,000 PD), Magnitude of winds for these 43 events ranged from 52 knots to 73 knots. Total damages: \$1,153,000 PD and \$226,000 CD.

2000's: 47 reported events by NCDC – (6/1/00 Hillsboro-\$4,500 PD), (6/13/00 Westby-\$5,000 PD), (5/10/01 Coon Valley-\$500 PD), (6/11/01 Westby-\$350 PD), (6/18/01 Viroqua-\$1,000 PD), (4/18/02 Readstown), (7/30/02 Genoa-\$750 PD), (8/17/02 Retreat-\$750 PD), (7/4/03 Stoddard-\$1,750 PD/\$500 CD & Viroqua-\$2,000 PD/\$1,500 CD & Westby \$750 PD/\$2,000 CD), (7/31/03 De Soto), (3/30/05 Genoa-\$750 PD), (6/11/05 Ontario-\$300 PD), (6/29/05 De Soto-\$1,500 PD, Liberty Pole-\$2,000 PD, Readstown-\$750 PD, Viroqua-\$500 PD, Ontario-\$2,500 PD & Hillsboro-\$2,000 PD), (7/25/05 Red Mound-\$1,000 PD/\$3,000 CD, Genoa, Viroqua-\$2,000 PD/ \$2,500 CD & Liberty Pole-\$1,500 PD/ \$4,500 CD), (9/13/05 Genoa-\$2,500 PD & Chaseburg-\$3,000 PD/\$5,000 CD), (7/1/06 Viroqua-\$10,000 PD/\$2,000 CD), (7/20/06 Hillsboro-\$400 PD), (5/23/07 West Prairie-\$1,000 PD), (7/3/07 Valley-\$250 PD), (8/13/07 Hillsboro-\$1,000 PD), (8/14/07 Chaseburg-\$500 PD, & Purdy-\$800 PD), (8/21/07 Victory-\$10,000 PD, De Soto-\$2,500 PD, Viroqua-\$2,500 PD, West Prairie-\$13,000 PD & Rockton-\$3,000 PD), (9/21/07 Coon Valley-\$500 PD, Westby-\$10,000 PD & Coon Valley-\$500 PD), (5/30/08 Stoddard-\$500 PD & Ross-\$750 PD), (7/10/08 Stoddard-\$500 PD, Bloomingdale-\$4,500 PD & Viroqua-\$1,500 PD) and (7/27/09 La Farge-\$3,000 PD/ \$10,000 CD). Magnitude of winds for these 47 events ranged from 50 knots to 64 knots. Total damages: \$104,350 PD and \$31,000 CD.

2010's: 24 reported events by NCDC – (6/23/10 Readstown-\$2,000 PD), (7/14/10 Esofea-\$500 PD, Springville-\$7,000 PD, Westby, and Viroqua-\$2,500 PD), (8/31/10 Liberty Pole-\$27,000 PD/\$1,000 CD), (4/10/11 Genoa-\$1,500 PD), (9/2/11 Stoddard-\$20,000 PD, Chaseburg-\$15,000 PD, Coon Valley-\$30,000 PD, Bloomingdale-\$5,000 PD), (Bud-\$1,000 PD, Westby-\$1,000 PD), (9/4/12 Genoa-\$10,000 PD, Red Mound-\$35,000 PD), (9/5/12 Victory-\$3,000 PD), (5/19/13 Westby-\$2,000 PD), (5/29/13 Viroqua-\$4,000 PD), (5/30/13 Bud), (6/21/13 Westby-\$3,000 PD), (7/22/13 Stoddard-\$1,000 PD), (6/16/14 Coon Valley, Hillsboro), (5/1/16 Mt. Tabor-\$1,000 PD/\$1,000 CD), (5/25/16 Readstown-\$2,000 PD, Sugar Grove-\$2,000 PD, Hillsboro-\$2,000), (6/30/16 Stoddard-\$1,000 PD, Viroqua-\$3,000 PD), (7/5/16 Victory-\$1,000 PD/\$16,000 CD), (3/6/17 Stoddard-\$2,000 PD, Chaseburg-\$2,000 PD, Bud-\$5,000 PD, Viroqua-\$5,000 PD, La Farge, Hillsboro-\$2,000 PD), (5/17/17 Hillsboro-\$3,000 PD, West Prairie-\$60,000 PD, Readstown-\$4,000 PD, Greenwood), (6/14/17 Kickapoo Center-\$1,000 PD, Ross-\$1,000 PD), (6/16/17 Coon Valley-\$12,000 PD, Liberty Pole-\$4,000 PD, La Farge-\$10,000 PD), (7/12/17 Viroqua-\$5,000 PD, Dell-\$3,000 PD), and (7/19/17 Stoddard-\$4,000 PD, Chaseburg-\$15,000 PD, Readstown-\$5,000 PD, La Farge-\$5,000 PD). Magnitude of winds for these 24 events ranged from 40 knots to 70 knots.

PD = Property Damage and CD = Crop Damage

Thunderstorm frequency is measured in terms of incidence of *thunderstorm days* or days on which thunderstorms are observed. Wisconsin averages between 30 and 50 thunderstorm days per year depending on location, with the southwestern area of the state normally having more thunderstorms than the rest of the state. A given county may experience ten or more thunderstorm days per year.

According to the National Weather Service Publication, *Storm Data*, in the past 30 years, Wisconsin has experienced hurricane force winds of 75 mph or higher on 120 days or about 4 days per year on average. Within the same period there have been 17 days when winds at or above 100 mph have been documented. This means that winds similar to a Category 2 Hurricane are experienced about one day every two years on average in Wisconsin. Thunderstorm winds can be fatal. During the period from 1982 to 2001, 20 fatalities have been attributed to wind from severe thunderstorms.

In Wisconsin, thunderstorms and their associated high winds can occur throughout the state during any month of the year with little or no notice, but their highest frequency is during the period of May through September. They also occur most often between the hours of noon and 10:00 p.m.

Between 1990 and 2017 the NCDC reported 115 Thunderstorm events in Vernon County. Of these 115 Thunderstorms 65 of them resulted in property damage and 13 had crop damage reported. The total property damage reported for these 65 thunderstorms was \$1,589,850 with the largest amount of damage from the 6/27/98 storm which had \$648,000 in damages. The total crop damage reported totaled \$275,000 during those 13 storms with the largest amount reported from the 6/27/98 storm which had \$126,000 in damages. Based upon this historical data when Vernon County experiences a thunderstorm large enough to cause property damage or crop damage the average amount of property damage to occur is \$24,500 and the average amount of crop damage is \$21,000. Between 1990 and 2017 Vernon County averaged 4.1 thunderstorms per year. Based upon these averages the County can expect to experience 21 thunderstorms within the next 5-year period. If historical trends continue the county can expect that 57% of these storms will be strong enough to cause property damage. This would result in 12 storms strong enough to cause property damage resulting is \$294,000 in property damage. In addition, 11% of these storms will cause crop damage. This would result in 2 storms causing \$42,000 of crop damage during that same 5-year period.

Thunderstorm Vulnerability Assessment

- Critical Facilities. In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns thunderstorms a risk factor of 24 indicating this natural hazard is a high risk to the county. Thunderstorms can produce heavy rains and downbursts that induce straight-line winds with high wind speeds. Buildings could be damaged by the high winds and temporary flooding could occur in low-lying areas where these facilities are located. Thunderstorms can also produce three violently destructive natural elements which include lightning, tornadoes, and hailstorms which are discussed separately in this chapter. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- Business and Industry. Thunderstorms can cause damage to buildings by the high winds created by the storms and temporary flooding could occur in low-lying areas where these facilities are located. Thunderstorms can also produce violent destructive natural elements including lightning, tornadoes and hailstorms that can cause severe damage to buildings and can cause injuries and deaths to human.
- Agriculture. Thunderstorms can cause significant damage to agricultural crops, buildings and livestock. Heavy rains can cause erosion, wash out seedlings and create standing water in fields. Downspouts and straight-line winds can cause damage to buildings and flatten crops. The other natural elements that are produced by thunderstorms, including lightning, hailstorms and tornadoes can cause severe damage to crops, buildings and livestock.
- Roads and Highways. Heavy rains can limit visibility for drivers. Electric traffic signals can malfunction. Washouts and spot flooding can occur. Debris cleanup from roadway is needed soon after the storm.
- Railroads. Signals and electric switches can malfunction. Washouts and spot flooding can occur. Debris cleanup from tracks and right-of-way is needed soon after the storm. Damage to freight in poorly fitted cars or covered loads can cause problems, often discovered days or weeks later.
- Airway. Flight operations of aircraft, especially small planes, can be disrupted during the storm. Planes from other areas passing over the County may put down at local private airports as "port of refuge". Small aircraft parked on ground at private airports may be damaged.
- Waterways. Poor visibility during the storm can cause safety problems to pilots. Dangerous conditions may exist for deck crews and lock crews working outside during the storm. Locking may be aborted. Improperly moored barges could break loose from fleets or terminals.
- Municipal Water. In the county there are 20 municipal wells and water systems in operation, see Table 3-11. These facilities vulnerability to thunderstorms would include damage from high winds and heavy rainfall and could pollute underground wells. Other natural elements that are produced by thunderstorms include lightning, hailstorms, and tornadoes and can cause severe damage to municipal water facilities and equipment. Services provided by these facilities would not be interrupted except in extreme cases.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. The facilities vulnerability to thunderstorms would include damage to buildings and equipment from high winds. Heavy rainfall could cause holding ponds to overflow and treatment facilities could be inundated with water that could cause system failure. Thunderstorms can also produce lightning, hailstorms and tornadoes that could severely damage the wastewater treatment facilities and equipment. Services provided by these facilities would not be interrupted except in extreme cases.
- Hazardous Material Sites. The impact of thunderstorms on hazardous material is specific to the type of material and its storage or transportation conditions. Material in a state of transportation is more vulnerable than material in storage.

Thunderstorm Risk Assessment Designation

Thunderstorm Historical Occurrence Rating: High - 9

Thunderstorm Vulnerability Rating: Negligible - 2

Thunderstorm Probability Rating: Highly Likely - 8

Thunderstorm Local Official Survey Rating: Medium/High - 5

Thunderstorm Risk Assessment Designation: **High Threat – 24 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Thunderstorm Hazard Mitigation Ideas: • Communities may use outreach programs to promote awareness of thunderstorm dangers - for example: during Severe Weather Awareness Week emphasize issues on weather related disaster preparedness through public education • Local and state governments can invest in public early warning systems/networks,

as well as train people to serve as weather spotters • Provide weather radios to critical areas • Public and private buildings can be designed with structural bracing, shutters, laminated glass in window panes, and hail resistant roof shingles or flashing to minimize damage • Bury power lines with consideration for maintenance and repair • Promote indoor warnings at all critical facilities • Communities may adopt building codes requiring weatherproofing such as wall and roof anchoring, reinforcement of walls, ceilings and floors, etc. • Cleaning and clearing culverts, drains, and waterways must be kept uppermost as a maintenance practice • An emergency plan for retrieving and securing run away barges should be developed in cooperation with the barge towing industry and water-based terminals

3.4 Vernon County, Tornado/High Winds Risk Assessment

Tornado/High Winds Definition: A tornado is a relatively short-lived storm composed of an intense rotating column of air, extending from a thunderstorm cloud system. It is nearly always visible as a funnel, although its lower end does not necessarily touch the ground. Average winds in a tornado, although never accurately measured, are between 100 and 200 miles per hour, but some may have winds exceeding 300 miles per hour. For standardization, the following are National Weather Service definitions of a tornado and associated terms:

- *Tomado* – a violently rotating column of air that is touching the ground
- *Funnel Cloud* – a rapidly rotating column of air that does not touch the ground
- *Downburst* – A strong downdraft, initiated by a thunderstorm, which induces an outburst of straight-line winds on or near the ground. They may last anywhere from a few minutes in small-scale micro-bursts to periods of up to 20 minutes in large, longer macro-bursts. Wind speeds in downbursts can reach 150 mph, in the range of a tornado.

A tornado path averages four miles but may reach up to 300 miles in length. Widths average 300-400 yards, but severe tornadoes have cut swaths a mile or more in width or have formed groups to two or three funnels traveling together. On the average, tornadoes move between 25 and 45 miles per hour, but speeds over land of up to 70 mph have been reported. Tornadoes rarely last more than a couple of minutes over a spot or more than 15-20 minutes in a ten-mile area, but their short periods of existence do not limit their devastation of an area.

The destructive power of a tornado results primarily from its high wind velocities and sudden changes in pressure. Wind and pressure differentials probably account for 90 percent of tornado-caused damage. Since tornadoes are generally associated with severe storm systems, they are usually accompanied by hail, torrential rain and intense lightning. Depending on their intensity, tornadoes can uproot trees, down power lines and destroy buildings. Flying debris can cause serious injury and death.

Pre January 31, 2007-TORNADO DAMAGE SCALE			
Scale	Wind Speeds	Damage	Frequency
F0	40 to 72 MPH	Some damage to chimneys, TV antennas, roof shingles, trees and windows	29%
F1	73 to 112 MPH	Automobiles overturned, carports destroyed, trees uprooted	40%
F2	113 to 157 MPH	Roofs blown off houses, sheds and outbuildings demolished, mobile homes overturned	24%
F3	158 to 206 MPH	Exterior walls & roofs blown off homes. Metal buildings collapsed or are severely damaged. Forests & farmland flattened.	6%
F4	207 to 260 MPH	Few walls, if any, standing in well-built homes. Large steel and concrete missiles thrown far distances.	2%
F5	261 to 318 MPH	Homes leveled with all debris removed. Schools, motels and other larger structures have considerable damage with exterior walls and roofs gone. Top stories demolished.	Less than 1%
Post January 31, 2007 TORNADO DAMAGE SCALE			
Scale	Wind Speeds	Damage	Frequency
EF0	60 to 85 MPH	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees	53.50%
EF1	86 to 110 MPH	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; broken windows	31.60%
EF2	111 to 135 MPH	Considerable damage. Roofs torn off well-constructed houses; foundations shifted; mobile homes destroyed; trees uprooted; cars lifted	10.70%
EEF3	136 to 165 MPH	Severe damage. Entire stories of houses destroyed; damage to large buildings; trains overturned	3.40%
EF4	166 to 200 MPH	Devastating damage. Houses leveled; and cars thrown	0.70%
EF5	> 200 MPH	Total destruction. Houses swept off foundation; automobile sized missiles thrown through the air; high rise buildings deformed	Less than 0.1%

The new scale takes into account quality of construction and standardizes different kinds of construction. Meteorologists and engineers deemed the wind speeds on the original scale as being too high, and engineering studies indicated that slower winds than initially estimated cause the respective degrees of damage.

Downbursts are characterized by straight-line winds. Downburst damage is often highly localized and resembles that of tornadoes. There are significant interactions between tornadoes and downbursts and a tornado's path can also be affected by downbursts. Because of this, the path of a tornado can be very unpredictable, including veering right and left or even a U-turn.

Tornado/High Winds History and Frequency:

1950's: 1 reported event by NCDC – (9/19/57 \$25,000 PD) F1 Magnitude

1960's: 5 reported events by NCDC – (5/8/64 \$250,000 PD), (4/19/66 \$250,000 PD), (3/31/67 \$25,000 PD), (6/8/67 \$25,000 PD), 8/6/68. Magnitude ranged from F0 to F2.

1970's: 2 reported events by NCDC – 7/1/78, (8/9/79 \$250,000 PD). Magnitude ranged from F1-F2.

1980's: 1 reported event by NCDC – (6/5/80 \$2.75 million-1 injury) Magnitude ranged from F2-F3.

1990's: 5 reported events (2 *tornadoes* & 3 *high wind*) by NCDC – (4/20/92 Tornado F1-\$25,000 PD), (6/18/98 Tornado Retreat F1-\$100,000 PD/\$50,000 CD). (4/6/97 Winds of over 70 mph in Vernon & 4 other counties causing \$45,000 in PD); (6/27/98 Winds gusts of between 90 and 120 mph); and (11/10/98 Winds of up to 93 mph recorded, affected Vernon and 12 other counties, \$1.7 million PD/1injury/2deaths). Magnitude F1 and Winds ranged from 61 knots to 81 knots.

1 reported event reported by Wisconsin Emergency Management – 1998 High Winds and Severe Storms, \$11.1million in Public-Government Property and Facilities Damage and \$36.8 million in Private-Individual Property, Crop and Facilities Damage to Vernon and 13 other counties, *Presidential Disaster Declaration*.

2000's: 7 reported events (4 *tornadoes* & 2 *high winds*) by NCDC – (7/26/00 Tornado Chaseburg F0-\$8,000 PD/\$12,000 CD) F0 Magnitude. (4/7/01 Winds of 60-70 mph in Vernon and 9 other counties, \$12,000 PD), (10/25/01 Winds of 40-50 mph in Vernon and 12 other counties, no damages recorded), (8/18/05 Tornado: Esosfa F1, 1 injury, \$150,000 PD/\$50,000 CD; Liberty F2, \$800,000 PD/\$194,000 CD; Viola F1, 3 injuries, \$2.5 million PD, \$750,000 CD), (6/7/08 Tornado – Liberty Pole F0 - \$15,000 PD/\$10,000 CD) Winds ranged from 56 to 64 knots.

2010's: 2 reported events (1 tornado and 1 high wind) by NCDC – (10/26/10 50 knot winds recorded in Vernon County-\$18,000 PD) and (7/5/16 Tornado: Retreat EF0, \$5,000 PD).

PD = Property Damage and CD = Crop Damage

All counties in Wisconsin have recorded at least two tornadoes in the period for 1844-2017. The National Weather Service reported that Vernon County experienced 20 tornadoes during this period. In 1998, High winds in Vernon and 13 other counties caused so much damage that the region received a Presidential Disaster Declaration. The history above details tornadoes and high winds in the County from 1957 through 2017.

According to the NCDC between 1990 and 2017 Vernon County experienced 7 tornadoes. These 7 tornadoes caused \$1,103,000 in property damage, ranging from \$5,000 on 7/5/16 to \$800,000 on 8/18/05. Using this historical data Vernon County can expect to experience a tornado once every 4 years, which would cause \$220,600 in property damage.

Tornado/High Winds Vulnerability Assessment

- **Critical Facilities.** In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Tornado/High Winds a risk factor of 26 indicating this natural hazard is a high risk to the county. Critical facility's vulnerability to tornadoes and high winds could adversely affect 25 percent of the county's population or property in a single event, see Table 3-2. While tornadoes occur infrequently in the County, 27 occurred in the years 1844-2001. Tornadoes and High winds can cause critical facilities to sustain substantial damage or could be completely destroyed, causing injury and even death. High winds and storms occur more frequently than tornadoes in the county. In 1998, three events were reported in the county. In the events, Vernon County and thirteen other county critical facilities sustained \$11.1 million in damages to public and government property and the area received a Presidential Disaster Declaration. The services provided by these facilities would not be interrupted except in extreme cases. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.

- **Business and Industry.** In Vernon County there are 630 businesses and industries, see Table 3-6. For businesses and industries tornadoes and high winds pose a high hazard risk in the county. Buildings could sustain substantial damage or be completely destroyed causing injuries and even death. High winds occur more frequently and the extent of the damage to buildings is determined by wind speed. The damages could range from damage to chimney, roof shingles and broken windows to exterior wall and roofs blown off buildings or the buildings could collapse. Businesses that are particularly vulnerable to tornadoes and high winds are car and truck dealerships.
- **Agriculture.** Tornadoes and high winds pose a high hazard threat to agricultural buildings, crops and livestock. Tornadoes and high winds can cause significant damage to buildings and can cause injuries and deaths. These events can flatten crops and forests.
- **Roads and Highways.** Trailers, especially high profile, empty, or lightly loaded trailers, are susceptible to being blown over, or otherwise adversely impacted, by high winds. As wind speed increases, even sub-tornado speeds can adversely impact vehicle handling, especially on bridges or open areas with long wind sweeps. Gusty winds are particularly dangerous as they occur sporadically and unexpectedly and can cause unpredicted handling problems. High winds can blow fine soil/sand and other debris across the road and cause visibility problems, or direct damage to vehicles being struck by large blowing debris. Debris blown by high winds, sometimes rather large pieces of wood, tree limbs, or trash barrels, are blown onto highways and can cause safety problems even after the winds have subsided. Vehicles traveling on highways on ridge tops and oriented in a north-south direction are more subject to high wind damage than are highways in valleys or running parallel to the predominant wind direction.
- **Railroads.** High profile and/or lightly loaded cars, especially the "high cube" boxcars typically used to carry auto parts, can be blown over in high winds. Parked individual rail cars that are not properly chocked, or brake set can be set in motion by high winds striking the car at a critical angle. Heavy debris striking trains during a high wind episode can cause direct damage to the locomotive or cars. Wind deposited debris on the tracks can cause safety problems after the winds have subsided.
- **Airway.** Light weight general aviation aircraft, typical of the type most likely to be based at, or using the Viroqua or Hillsboro airports, are the most prone to wind damage while parked on the ground
- **Waterways.** High winds can have the same impact to craft on the Mississippi River as on lakes and oceans, with the wave action across long reaches of water creating potential for separating the barges and towboats. Waterway operations are controlled by the U.S. Coast Guard. Dangerous conditions may exist for deck crews and lock crews working outside during the storm. Locking may be aborted. Improperly moored barges could break loose from fleets or terminals.
- **Municipal Water.** In the county there are 20 municipal wells and water systems, see Table 3-11. These facilities and equipment could be significantly damaged or destroyed as a result of tornadoes and high winds. The services provided by these facilities would not be interrupted except in extreme cases.
- **Wastewater Treatment Facilities.** There are 11 wastewater treatment facilities operating in the county, see Table 3-12. These facilities and equipment could be significantly damaged or destroyed as a result of tornadoes and high winds. The services provided by these facilities would not be interrupted except in extreme cases.
- **Hazardous Material Sites.** Hazardous material in transit is exposed to the same dangers as the mode of transport. Hazardous material in storage is more vulnerable than other material, and storage buildings should be storm reinforced.

Tornado/High Winds Risk Assessment Designation

Tornado/High Winds Historical Occurrence Rating: High - 7

Tornado/High Winds Vulnerability Rating: Critical - 5

Tornado/High Winds Probability Rating: Highly Likely - 6

Tornado/High Winds Local Official Survey Rating: High - 8

Tornado/High Winds Risk Assessment Designation: **High Threat – 26 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Tornado/High Winds Hazard Mitigation Ideas: • Local and state governments can invest in public early warning systems/networks, as well as train people to serve as weather spotters • Provide weather radios to critical areas • Encourage development of storm shelters in each community readily accessible to the public • Strengthen public and private structures by using engineering measures and construction techniques that may include structural bracing, straps and clips, anchor bolts, laminated or impact-resistant glass, reinforced pedestrian and garage doors, window shutters, waterproof adhesive sealing strips, or interlocking roof shingles • Construct and use concrete safe rooms in homes and shelter areas of mobile home parks, fairgrounds, shopping malls, or other vulnerable public areas • Anchor manufactured homes and exterior

attachments such as carports and porches • Communities may adopt building codes requiring weatherproofing such as wall and roof anchoring, reinforcement of walls, ceilings and floors, etc. • Secure loose yard items like yard and patio furniture • Protect temporary debris disposal sites by fencing and/or locating away from populated areas • Require use of special roofing shingles designed to interlock and resist uplift forces • Bury power lines • Designed failure mode to power line design • Provide backup power resources that can enable critical facilities to continue basic services and can be used by businesses to ensure security and protect refrigerated goods • Prune trees near power lines • Promote public education during Severe Weather Awareness Week • Promote preparation of a home tornado plan and assembling a disaster supply kit • Highway agencies need to begin immediate patrols after high winds have swept through an area to clean dangerous debris off the road and shoulder, and insure road signs and traffic signal are visible and functioning • Railroad company maintenance-of-way forces should conduct patrols as soon as possible after a heavy wind event to remove debris on the tracks • An emergency plan for retrieving and securing run away barges should be developed in cooperation with the barge towing industry and water-based terminals

3.5 Vernon County, Riverine/Flash Flooding/Storm Water Flooding Risk Assessment

Riverine/Flash Flooding Definition: Flooding occurs when a river, stream, lake or other body of water overflows its banks onto normally dry land or there is an excessive pooling of surface water. These events can be slow to develop or happen very quickly. Flash floods are usually the result of excessive precipitation or rapid snowmelt and can occur suddenly with awesome power. Increased demand for housing along Wisconsin's waterfronts increases flooding vulnerability.

Flood related hazards in Wisconsin arise from a complex set of hydrologic and hydraulic interactions, including excessive precipitation, rapid snowmelt, ice or debris jams in waterway channels and dam or levee failures. These result in river flooding, stream flooding, coastal flooding and erosion, bank slumping, inland lake flooding, flash flooding, flooding from levee and dam failure and storm water runoff and ponding.

The effects of flooding can be devastating and cause extensive property damage. Although the probability of serious injury and loss of life is usually low, flooding increases the likelihood of long-term health hazards from water-borne diseases, mold, mildew, insect infestation and contaminated drinking water. Long-term damage to the environment may also result from flooding of sites containing hazardous materials or waste.

Major floods in Wisconsin tend to occur either in the spring when melting snow adds to runoff from rain or in summer and early fall after intense rainfalls. Flooding which occurs in the spring due to snowmelt and/or prolonged periods of heavy rain is characterized by a slow build-up of flow and velocity in rivers and streams over a period of days. This build-up continues until the river or stream overflows its banks, for as long as a week or two. The water then slowly recedes inch by inch to its original level. The expected occurrence and location of this type of flooding is fairly predictable and normally there is sufficient time for the orderly evacuation of people and property.

Flash flooding, which usually results from surface runoff after intense rains or the failure of water control structures, also poses a threat to all areas of Wisconsin. This is an extremely dangerous form of flooding because it is not very predictable. It can occur very quickly, precluding evacuation to higher ground to prevent loss of life. Small and normally calm rivers and streams will rise very rapidly when surrounding soil and terrain are unable to accommodate intense precipitation. Raging torrents of water can rip through waterways, surging well beyond normal banks and sweeping away everything in their path. Houses, structures, bridges, and boulders can be tossed and rolled by a flash flood. The strength of the water current, carrying debris and surging through an area, can cause serious injuries and death. It can also interrupt power, disable fuel sources, make roads impassable, hamper response efforts and strand people in their homes awaiting rescue.

Riverine/Flash Flooding History and Frequency:

1950's: 1 event reported by St. Paul Water Control Center Flood Information: 1951-Kickapoo River-Readstown, Gage Reading, 44.08'.

1960's: 2 events: (1965 - Mississippi River Flood of Record, 638.37 MSL, Lock & Dam 8 Tailwater Gage, Genoa, WI- *Presidential Disaster Declaration*), (1969 - Mississippi River Flood, 635.24 MSL, Lock & Dam 8 Tailwater Gage, Genoa, WI)

- 1970's: 3 reported events by Wisconsin Emergency Management: (1971 - Mississippi River Flood, River Level 17.7', and 623 MSL), (1975 - Mississippi River Flood, \$633,500-Public Gov't Property and Facilities Damage and \$1.8 million Private-Individual Property, Crop and Facilities Damage to Vernon and 7 other counties), (1978 - Flooding and Tornadoes, \$11.7 million- Public Gov't Property and Facilities Damage and \$40 million Private-Individual Property, Crop and Facilities Damage - to Vernon and fifteen other counties, *Presidential Disaster Declaration*).
- 1980's: 1 reported event by Wisconsin Emergency Management: 1980 - High Winds/Heavy Rains/Tornadoes, \$3.5 million-Public Gov't Property and Facilities Damage and \$6.9 million Private-Individual Property, Crop and Facilities Damage to Vernon and 10 other counties.
- 1990's: 5 reported events by NCDC: (2/20/94-Flood Rockton); (6/16/96-Flash Flood Victory, \$250,000 PD & \$250,000 CD); (4/3/97 - Mississippi River Flood, 3rd highest on record, \$1 million PD - to Vernon and five other counties); (6/27/98-Flash Flood Viroqua, \$12,000 PD); (7/20/99-Flash Flooding central portion of county, \$8,000 PD & \$3,000 CD).
- 4 reported events by Wisconsin Emergency Management: (1990-Flooding/Tornadoes, \$4.6 million- Public Gov't Property and Facilities Damage and \$16.5 million Private-Individual Property, Crop and Facilities Damage - to Vernon and 16 other counties, *Presidential Disaster Declaration*), (1992 - Flooding/Kickapoo River Flood, \$1.9 million- Public Gov't Property and Facilities Damage and \$15.8 million Private-Individual Property, Crop and Facilities Damage - to Vernon and nine other counties, *Presidential Disaster Declaration*), (1993 -Flooding, Storms, Tornadoes, Heavy Rain/Mississippi River Flood, \$47 million- Public Gov't Property and Facilities Damage and \$700 million Private-Individual Property, Crop and Facilities Damage - to Vernon and 46 other counties, *Presidential Disaster Declaration*), (1996-Flooding/Severe Storms, \$4.7 million- Public Gov't Property and Facilities Damage and \$194 million Private-Individual Property, Crop and Facilities Damage - to Vernon and 14 other counties).
- 2000's: 17 reported events by NCDC - (5/17/00 -Countywide Urban/small stream flood); (5/31/00 - Countywide Flash Floods, \$60,000 PD & \$20,000 CD); (6/1/00-Countywide Flooding due to heavy rains, \$3.5 million PD & \$500,000 CD); (7/26/00 - Countywide flash flooding, \$35,000 PD & \$15,000 CD); (4/10/01 - Mississippi River Flood, \$6.5 million PD - to Vernon and five other counties); (5/1/01-Mississippi River Flooding, \$7.5 million PD to Vernon and five other counties); (5/8/04 Southwest portion flashing flooding - 1 death, \$15,000 PD); (5/21/04 - Flooding along the Kickapoo River, \$27,000 C), Countywide flash flooding, \$250,000 PD, \$250,000 CD); (5/23/04 - Countywide flash flooding, \$125,000 PD, \$90,000 CD); (8/18/07 Stoddard, flash flood \$28.2 million PD, \$500,000 CD); (8/19/07 Coon Valley, flash flood, 2.0 million PD), Springville flash flood, \$150,000 PD, \$30,000 CD, Readstown flooding, \$150,000 PD, \$50,000 CD, Viroqua flooding, \$3.5 million PD, \$250,000 CD); (8/21/07 Stoddard flash flooding, \$2,000 PD); (8/27/07 La Farge flash flooding, \$1,000 PD); (8/27/07 Red Mound flash flooding, \$3,000 PD); (6/7/08 Ontario flooding, \$750,000 PD, \$250,000 CD, Stoddard flash flooding, 2.3 million PD, \$950,000 CD, Liberty flooding, \$800,000 PD, \$350,000 CD; La Farge flash flooding, \$500,000 PD, \$400,000 CD; (6/8/08 La Farge flooding, \$2.6 million PD, \$1.3 million CD, Readstown flooding, 1.0 million PD, \$500,000 CD, Coon Valley flooding, \$750,000 PD, \$250,000 CD, Hillsboro flooding, \$800,000 PD, \$300,000 CD, Valley flooding \$850,000 PD, \$300,000 CD, Hillsboro-Kickapoo area flooding, \$900,000 PD, \$300,000 CD); and (7/16/08 Green Wood flooding \$5,000 PD).
- 5 reported events by Wisconsin Emergency Management: (1) 2000-Heavy rains/storms/flooding, \$37.6 million- Public Gov't Property and Facilities Damage and \$25.2 million Private-Individual Property, Crop and Facilities Damage - to Vernon and 29 other counties, *Presidential Disaster Declaration*. (2) 2001 -Flooding/Storms/Tornado, \$47.7 million- Public Gov't Property and Facilities Damage and \$56.1 million Private-Individual Property, Crop and Facilities Damage - to Vernon and 31 other counties, *Presidential Disaster Declaration*. (3) 5/19/04 through 7/3/04 severe storms and flooding impacted 37 Wisconsin Counties. A *Presidential Disaster Declaration* was declared, and Vernon County's local governments, individuals and businesses became eligible for grants and low interest loans. The damage assessment for publicly owned properties exceeded \$1.37 million. (4) 2007 - Flooding/Storms, \$13 million in assistance to Vernon and 13 other counties, *Presidential Disaster Declaration*. (5) June 2008 - an unprecedented amount of rain fell. A series of storms dating from June 5 - 12 caused widespread flooding that resulted in damage to thousands of homes, businesses and roads. Vernon County and 30 other counties received Presidential Disaster Declarations. Over \$96 million in disaster assistance was approved. Vernon County received over \$1.7 million in assistance from the Wisconsin Individual and Household programs.
- 2010's: 30 reported events by NCDC - (5/25/10 Hillsboro); (6/23/10 Stoddard & Chaseburg-\$10,000 PD); (7/7/10 Kickapoo Center); (7/14/10 Hillsboro Kickapoo Area); (7/15/10 Hillsboro-\$2,000 PD, La Farge); (7/16/10 Kickapoo Center); (8/9/10 Chaseburg, La Farge); (8/13/10 Trippville-\$934,300 PD, Hillsboro, Rockton, La Farge, Readstown); (8/14/10 Liberty); (9/23/10 Ontario, Chaseburg); (9/24/10 Kickapoo Center); (3/22/11 Readstown); (3/23/11 Kickapoo Center); (6/18/11 West Prairie); (6/19/11 Retreat, Viroqua-\$1,000 PD, Bud-\$2,000 PD, West Prairie-\$5,000 PD, Readstown); (7/18/12 Viroqua); (4/10/13 Readstown, Potts Corner, Kickapoo Center); (6/21/13 Chaseburg, Genoa-\$2,000 PD); (6/22/13 De Soto-\$500,000 PD, Readstown); (3/27/14 Ontario); (3/28/14 Readstown, Viola); (4/14/14 Kickapoo Center); (6/1/14 Westby, Bloomingdale, Esofea, Bud, Ross); (12/14/15 Kickapoo Center, Ontario); (12/15/15 Readstown); (9/7/16 Bud, Viroqua, Readstown, Kickapoo Center); (9/9/16 Avalanche); (9/22/16 Viroqua-\$9,866,000 PD, Readstown, La Farge, Kickapoo Center, Ontario); (7/12/17 Coon Valley); and (7/20/17 Ontario, Readstown, Stoddard-\$778,000 PD & \$5,300,000 CD, Kickapoo Center, La Farge).

PD = Property Damage and CD = Crop Damage

The Mississippi River, the largest river in the state, borders Vernon County making low-lying areas in the county prone to flooding. In addition, other small rivers in the Vernon County flood periodically. The Kickapoo River has a long history of flood events dating back to 1907. The history above details flooding events in the county from 1951 to 2017. Heavy Rains on August 27th & 28th and September 3rd & 4th of 2018 caused extensive flooding in Vernon County. A presidential disaster was declared in October. At the time of this update total damage amounts are still being collected. Vernon County has received twelve Presidential Disaster Declarations since 1990 due to flooding, these were in: 1990; 1992; 1993; 1998; 2000; 2001; 2004; 2007; 2008; 2013; 2016; 2017 and 2018.

Flood Warning and Evacuation Plans – Mississippi River: Flood events on the Mississippi River are generally predictable and with rare exception even the crest height can be accurately forecast several days to a week or more before the event. There is no history of flash flooding on this part of the Mississippi River. There is usually ample time to prepare for a flood event, and to minimize flood damage by moving property out of lower elevations. This predictability makes the development of a flood warning and evacuation plan a practical concept.

Flood Warning and Evacuation Plans – Other Rivers: Vernon County has developed Emergency Action Plans for all 22 of the PL 566 dams in the County. The Emergency Action Plans outline the physical conditions (heavy rainfall, rising flood pools, damage to dam components) that can trigger a 3-tier response of County Emergency Management systems to protect the lives and property of downstream residents. Included in the response is an evacuation plan for downstream residents. The County also has installed river gauges on the Kickapoo River and Brush Creek.

Floodplain Development and Regulation

- County (unincorporated area) Floodplain Management Program: Enforcement and day-to-day administration of the County Floodplain Zoning Ordinance is conducted by the County Zoning Administrator. The Zoning Administrator reviews and issues floodway or flood fringe land use permits based on the permitted uses and prohibited uses outlined in the County Floodplain Zoning Ordinance. Standards for structures and buildings being built are also outlined in the Floodplain Ordinance. Reviewing plans of structures and buildings and then inspecting them is another floodplain management responsibility. Reporting to the DNR on decisions on variances, appeals, amendments, and violations pertaining to floodplain zoning and reporting violations to the County Zoning Agency and County Attorney for prosecution are also an integral part of the County Zoning Administrator's responsibilities. The County Zoning Administrator also frequently advises applicants of the provisions of the Floodplain Zoning Ordinance and assists them in properly preparing permit applications or proceeding with an appeals or amendment request. The existing floodplain ordinance being currently used is contemporary and understandable therefore no changes are proposed to it at this point in time. This ordinance was updated and adopted in 2012.

Regulating Development. The development that occurs within the unincorporated areas of the County is subject to two ordinances. These are the County Shoreland-Wetland Ordinance and the County Floodplain Zoning Ordinance. The purpose and how the County addresses development with these ordinances is discussed below.

County Floodplain Zoning Ordinance. The State of Wisconsin has delegated responsibility to counties to administer and enforce floodplain zoning in unincorporated areas. This regulatory activity is to be conducted in accordance with Chapter NR 116 of Wisconsin Administrative Code and the standards of the National Flood Insurance Program.

Floodplains are land areas which have been or may be covered by floodwater during the "regional flood". The regional flood is a flood determined to be representative of large floods known to have occurred in Wisconsin or which may be expected to occur on a particular lake, river or stream. The regional flood is based upon a statistical analysis of lake level or stream flow records available for the watershed or an analysis of rainfall and runoff characteristics in the watershed or both. In any given year, there is a 1% chance that the regional flood may occur or be exceeded. This regional flood is often referred to as the 100-year flood.

The floodplain is made up of the floodway and flood fringe areas. A floodway is the channel of a river or stream and those portions of the floodplain adjoining the channel required to carry the regional flood discharge. A flood fringe is that portion of the floodplain outside of the floodway, which is covered by floodwater during the regional flood. The term flood fringe is generally associated with standing water rather than flowing water.

Prohibiting new residential construction in the floodway, regulating improvements to existing residential structures in the floodway, requiring dry land access to new development in the flood fringe and requiring a floodplain zoning or shoreland-wetland permit application for all floodplain or shoreland-wetland development are common examples on how the County addresses development and redevelopment in its floodplains and shoreland-wetland areas.

County Shoreland-Wetland Ordinance. The State of Wisconsin has delegated responsibility to counties to protect shoreland-wetlands in unincorporated areas. Shoreland wetlands are defined as wetlands of five acres or larger in size, identified on Wisconsin Wetland Inventory Map, and in the Shoreland Zone. The Shoreland Zone is defined as the area located 1,000 feet of the ordinary high-water mark of a navigable lake, pond or flowage or within 300 feet of the ordinary high water mark of a navigable stream or to the landward side of the floodplain whichever distance is greater. These regulations are unique in that they regulate additional uses detrimental to shoreland-wetland areas and preserve the shore cover and natural beauty by restricting the removal of natural shoreland cover and controlling shoreland-wetland excavation, filling and other earth moving activity.

City and Village Floodplain Management Programs: The State of Wisconsin has delegated responsibility to cities and villages to administer and enforce floodplain zoning in incorporated areas. This regulatory activity is to be conducted in accordance with Chapter NR 116 of Wisconsin Administrative Code and the standards of the National Flood Insurance Program.

National Flood Program Community Status

Community	In Good Standing	Initial FHBM Identified	Initial FIRM Identified	Current Effective Date
V. Chaseburg	Yes	12/28/73	02/04/81	11/02/12
V. Coon Valley	Yes	04/12/74	02/04/81	11/02/12
V. De Soto	Yes	01/09/74	01/16/81	10/15/16
V. Genoa	Yes	05/08/71	02/26/72	11/02/12
V. La Farge	Yes	12/17/73	11/16/90	11/02/12
V. Ontario	Yes	01/09/74	11/02/12	11/02/12
V. Readstown	Yes	12/07/73	11/16/90	11/02/12
V. Stoddard	Yes		10/26/72	11/02/12
V. Viola	Yes	12/17/73	06/04/90	12/8/16
C. Hillsboro	Yes	05/31/74	06/01/87	11/02/12
C. Viroqua	Not Participating			
C. Westby	Not Participating			
Vernon County	Yes	01/03/75	09/29/78	11/02/12
Note: The cities of Viroqua and Westby have chosen not to participate due to the topography of the cities which creates a very low risk of riverine flooding.				

Flood Mitigation Projects in Vernon County

Vernon County has a history of successful mitigation projects. Using a combination of FEMA, State and Local dollars the County has completed two voluntary buyouts and is in the process of completing a third. The first project was in the Village of La Farge which completed a voluntary buyout after severe flooding in 2007 and again in 2008. The Village acquired and removed 19 residential structures for a total cost of \$969,800. A second project was a voluntary buyout in the Village of Chaseburg in 2009 – 2010. The Village spent \$1,461,000 acquiring and removing 12 residential and 4 commercial structures. A third voluntary buyout of structures located in the hydraulic shadow of the P.L 566 dams or in FEMA floodplains is currently being undertaken. Within the last 5 years the county has spent \$1,772,600 purchasing and removing the following: 6 homes in the Town of Webster; 1 home in the Town of Christiana; 1 home in the Village of Genoa; 2 homes in the Town of Viroqua and 7 homes in the Town of Harmony.

Flooding Vulnerability Assessment

- **Floodplain Structures and Assessed Values.** Vernon County has a total of 262 parcels on which structures are located within the FEMA 100-year flood boundary. These 262 parcels have a total assessed land value of \$2,878,600; an assessed improvements value of \$11,673,150; and a total assessed value of \$14,551,750. The Town of Wheatland

(Battle Island) has the most parcels with 56 followed by the Village of La Farge with 40 parcels and the Town of Bergen with 24 parcels. These three municipalities account for 120 parcels or 45.8% of the total number of parcels and a total assessed value of \$6,884,100 or 47% of the County's total. Table 3-3 has a complete listing by municipality of the parcels located within FEMA's 100-year flood boundary. Map 3-6 shows the location of these properties throughout the floodplain.

- Repetitive Loss Structures. Repetitive Loss Structures are defined as those properties that have had two or more flood insurance claims of at least \$1,000 each. As of January 2018, there have been 15 structures that have had repetitive losses within the county. 10 are residential structures and 5 are commercial structures. These structures located in the Towns of Bergen, Clinton, Christiana, Harmony, Stark, Union, Wheatland, the Villages of Chaseburg, La Farge and the City of Hillsboro.
- Flood Risk Assessment. Determining potential damage to residential and commercial structures is a difficult undertaking without intense survey work. Some of the factors which make it difficult are: not all of the first floor elevations of the structures are the same; even structures adjacent to each other often have different first floor elevations; some areas will receive damage due to wave action or flowing water; some may appear to be flooded and heavily damaged from the outside but in fact have received little damage due to flood proofing techniques; some cannot be observed due to floodwaters inhibiting access; damages are often not reported; and damages that are reported are based on each property owners individual opinion of damage.

Despite these factors an attempt has been made to ascertain the approximate damages a 100-year flood would inflict on residences and businesses in the County. To assist in this damage assessment process the Federal Insurance Administration has prepared a table, which lists the percentage of damage to a structure based upon the amount of water in the first floor. This table can be found in the book titled "Design Manual for Retrofitting Flood-prone Residential Structures" published by FEMA. We used this table when determining the amount of damage to structures. To determine the amount of water in the first floor of structures and the number of structures, which would have water in the first floor, we used Flood Insurance Rate Maps, photos of the 2001 flood, and local knowledge of the areas. To make flood damage estimates more accurate we divided the County into 15 different areas; these are: 1) Mississippi River, from the north County line south to the Village of Genoa; 2) Village of Genoa; 3) Mississippi River – Battle Island; 4) Village of Chaseburg; 5) Coon Creek; 6) Bad Axe River; 7) Village of Readstown; 8) West Branch Kickapoo River; 9) Village of Viola; 10) Village of La Farge; 11) Kickapoo River – South County line north to V. La Farge; 12) Warner Creek/Cheyenne Valley Creek and Bear Creek; 13) Village of Ontario; 14) City of Hillsboro and 15) Cooley Creek.

Dividing the County into 15 different geographic areas enables the assignment of different real property values to different areas which is needed because each area is unique in regard to topography, hydrology and development characteristics. This process compensates for the change flood prone property can have across the County in property values from one area to another. By using an average value for each area more realistic flood damage estimates can be generated than if a county wide average value for each structure were used.

During a 100-year flood event the County would have a projected damage total to residential and commercial structures of approximately \$1.47 million. The area totals are as follows: 1) Mississippi River, from the north County line south to the Village of Genoa - \$180,956; 2) Village of Genoa - \$41,106; 3) Mississippi River – Battle Island - \$181,631; 4) Village of Chaseburg - \$48,960; 5) Coon Creek - \$46,701; 6) Bad Axe River - \$6,000; 7) Village of Readstown - \$59,999; 8) West Branch Kickapoo River - \$192,442; 9) Village of Viola - \$108,224; 10) Village of La Farge - \$222,085; 11) Kickapoo River – South County Line north to V. La Farge - \$31,990; 12) Warner Creek/Cheyenne Valley Creek and Bear Creek - \$96,625; 13) Village of Ontario - \$41,624; 14) City of Hillsboro - \$143,438 and 15) Cooley Creek - \$75,316. A detailed breakdown of the areas showing total number of structures affected and depth of water in the structures can be seen in Table 3-4.

- Critical Facilities. In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Flooding a risk factor of 25 indicating this natural hazard is a high risk to the county. While the overall risk of flooding to critical facilities in the county is negligible there are two critical facilities located within

the 100-year floodplain and vulnerable to flooding. The La Farge Fire Department and the Gunderson Lutheran Clinic in Hillsboro. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.

- Business and Industry. In Vernon County there are 630 businesses and industries that employ 7,123 people with an annual payroll of approximately \$242 million, see Table 3-6. In the county there are 43 businesses and industrial structures located in the floodplain. These businesses have an assessed value of \$3,247,550. Many of these businesses sustain flooding damage and economic losses in lesser flood events. Businesses and industries in the county that do not suffer physical damage often sustain significant income losses as a result of a flood event due to reduction in sales or production problems caused by flood induced customer loss, employee problems and input / output interruptions. Tourism related businesses in particular, such as restaurants, motels, marinas and campgrounds, suffer a loss of revenue because of reduced customers desiring to visit the area. The media publicity generated during a flood event focus on flood related disasters and creates a negative mind-set in the public that can persist long after the floodwaters recede.
- Agriculture. In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. The Natural Hazard Risk Assessment assigns flooding a high-risk factor in the county. The land adjacent to these rivers is mostly agricultural and pastures land that is subject to flooding.
- Roads and Highways. Of all the hazards discussed so far, flooding is the hazard most likely to seriously impact the transportation infrastructure, rather than the vehicles used in transportation, or transportation operations and safety. Periodic flooding of fixed waterways, such as streams and the Mississippi and Kickapoo Rivers is a known factor, and the extent of flooding, or potential flooding, has been delineated on maps. Several roadways in Vernon County are subject to flooding, either by the predictable, advance notice rising of the Mississippi or Kickapoo Rivers, or by the shorter advance warning flash flooding often besetting smaller streams. Other streams and low areas can result in water across the roadway, or at an intersection, even without the event being noted as a major flood event by FEMA.
- Railroads. Periodic flooding of fixed waterways, such as the Mississippi is a known factor, and the extent of the flooding, or potential flooding, has been delineated on maps. There are two railroad lines in Vernon County. The Burlington Northern & Santa Fe Railway's (BNSF) mainline between Chicago and the Twin Cities and the Iowa, Chicago & Eastern Railway lies along the Mississippi River. Stretches of the railroads are reinforced with large boulder and rock rip-rap as necessary during Mississippi River high water.
- Airway. There are two airports in Vernon County. The Viroqua Municipal Airport is not located in a floodplain and therefore is not subject to flooding. The airport in Hillsboro (Joshua Sanford Field) is located in a floodplain and therefore would be subject to flooding. Light plane operation would not be possible during times of flooding due to the runway being inundated with water.
- Waterways. The Mississippi River is the only commercially navigable waterway in Vernon County. Each Corps of Engineers Navigation Lock has a water elevation at which point the lock operations are stopped at that lock, and no further operations are conducted. All commercial tows whether up bound or down bound, seek secure mooring in existing fleeting areas if possible. Some tows may be permitted to pass through the lock to a different pool after closure, if it can be safely done, to allow a tow access to a more secure mooring location. Improperly moored barges could break loose from fleets or terminals. Three dams impact the Vernon County reach of the Mississippi River. The lock closure river elevation at Dresbach Lock 7 is 646.5 feet above mean sea level. Lock & Dam 8, located at the Village of Genoa closure elevation is 635.9, and Lock 9 located about 2 miles below Lynxville is 631.0.
- Municipal Water. In the county there are 20 municipal wells and water systems, see Table 3-11. These facilities are usually located outside the floodplain which lessens their vulnerability to flooding. With the volume of water associated with floods and the runoff from the lands and sites that are not usually covered by water, filterization could be accelerated and pollutants could migrate into the water source. Pumping stations in low areas may need to be protected.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities can be located in low-lying areas especially gravity type systems making them vulnerable to flooding. Homes and businesses with basement floor drains that empty directly into the wastewater treatment systems can overload wastewater treatment facilities if the buildings are flooded causing the discharge of untreated wastewater. Floodwaters can infiltrate into the piping of the system that could result in the system operating over its capacity. Lift stations may need to be protected.
- Hazardous Material Sites. Hazardous material in transit is subject to the same risk as other material on a given transportation mode. Hazardous material in a storage mode must be protected from floodwaters. Material stored in floodplains should be moved or flood proofed when a prediction of high water is received.

Riverine/Flooding Risk Assessment Designation

Riverine/Flooding Historical Occurrence Rating: High - 8

Riverine/Flooding Vulnerability Rating: Limited - 3

Riverine/Flooding Probability Rating: Likely - 6

Riverine/Flooding Local Official Survey Rating: Medium - 8

Riverine/Flooding Risk Assessment Designation: **High Threat– 25 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Flooding Hazard Mitigation Ideas:

- Acquire land in flood prone areas and remove structures and enforce permanent restrictions on development
- Relocate structures to less hazardous locations
- Elevate structures – mechanically lift so that the lowest floor, including the basement, is raised above the base flood elevation – utilities and other mechanical devices should also be raised above expected flood levels
- Dry-floodproofing – keep water out by strengthening walls, sealing openings, or by using waterproof compounds or plastic sheeting on walls
- Wet-floodproofing – Use water resistant paints or other materials that can allow for easy cleanup after floodwater exposure in accessory structures or in a garage area below an elevated residential structure. In basement, wet-floodproofing may be preferable to attempting to keep water out completely.
- Adopt zoning ordinances that limit development in the floodplain
- Limit density of developments in the floodplain
- Require that floodplains be kept as open space
- Subdivision design standards can require elevation data collection during the platting phase and lots may be required to have a buildable space above the base flood elevation
- Requirements for building design standards and enforcement include the following possibilities: 1) that a residential structure be elevated; and 2) that a non-residential structure be elevated or floodproofed
- Conservation easements may be used to protect environmentally significant portions of parcels from development – they do not restrict all use of the land, rather they direct development to areas of land that are not environmentally significant
- Purchasing flood insurance does not prevent a flood from occurring, but it does mitigate a property owner's financial exposure to loss from flood damage
- By taking initiative locally, to more accurately map problem areas with information not already on FEMA maps a community can warn residents about potential risks that may not have been anticipated
- To maintain dry access, roads should be elevated above the base flood elevation. However, if a road creates a barrier it can cause water to pond. Where ponding is problematic, drainage and flow may be addressed by making changes to culvert size and placement.
- Flood warning can alleviate health and safety risk by providing citizens time to escape and possibly remove belongings that could be damaged. NOAA weather radio and EAS broadcasts can be incorporated into a community's flood warning system
- Local and state governments should have a plan/procedure in place for flood damage control by establishing volunteer teams available for sandbagging etc. and providing for temporary relocation and storage of equipment, furniture etc.
- Communities should develop a post-flood clean up- decontamination, and recovery plan/procedures
- Alternate routes can be determined and marked in advance of the actual flooding
- Movable message portable signs should be posted at locations where motorists can make detour decisions before entering into the flooded road segment
- Cleaning and clearing culverts, drains, and waterways must be kept uppermost as a maintenance practice
- After a flood it is especially important to check and maintain all drainage ways
- Highway agencies need to begin immediate patrols after floods have swept through an area to clean dangerous debris off the road and shoulder, and insure road signs and traffic signal are visible and functioning
- An emergency plan for retrieving and securing run away barges should be developed in cooperation with the barge towing industry and water-based terminals
- Have public relations strategy in place to counteract negative media reports after a flood to maintain community's tourism base
- Develop an electronic flood warning system for residences in flood prone areas
- Have a plan in place to warn/evacuate tourists

3.6 Vernon County, Dam Failure Flooding Risk Assessment

Dam Failure Flooding Definition: A dam failure involves the uncontrolled release of stored water due to the breaching of a water control structure, resulting in rapid downstream flooding. A dam can fail because of excessive rainfall or melted snow, poor construction or maintenance, flood damage, earthquake activity, weakening caused by burrowing animals or vegetation, surface erosion, vandalism or a combination of these factors. Dam failures can result in the loss of life and significant property damage in an extensive area downstream of the dam.

Dams serve many purposes, including agricultural uses, providing recreation areas, electrical power generation, erosion control, water level control and flood control. The federal government has jurisdiction over dams that produce hydro-electricity-

approximately 5% of the dams in Wisconsin. Private individuals own approximately 50% of the dams in Wisconsin, the State owns 19%, municipalities such as townships or county governments own 16% and 15% are owned by various other groups. The Wisconsin Department of Natural Resources regulates all dams on waterways to some degree. However, the majority of dams overall in Wisconsin are small and are not stringently regulated for safety purposes.

Most of the dams that provide a flood control benefit are large hydroelectric dams on major rivers where flood control is a secondary benefit, or they are PL 566 dams built through the Watershed Protection and Flood Prevention Act of 1954. The PL 566 dams hold little or no water in their reservoirs under normal conditions. Since these dams only hold significant amounts of waters during floods, they present a special hazard as everyday water related problems such as seepage cannot be readily seen and corrected. When floodwater does arrive, the dam is used to its maximum capacity. Twenty-two dams in Vernon County were included in the study.

For emergency planning purposes, dam failures are categorized as either *rainy day* or *sunny day failures*. *Rainy day failures* involve periods of excessive precipitation leading to an unusually high runoff. This high runoff increases the reservoir of the dam and if not controlled, the overtopping of the dam or excessive water present can lead to dam failure. Normal storm events can also lead to rainy day failures if water outlets are plugged with debris or otherwise made inoperable. *Sunny day failures* occur due to poor dam maintenance, damage/obstruction of outlet systems or vandalism. This type is the worst case of failure and can be catastrophic because the breach is unexpected and there may not be sufficient time to properly warn downstream residents.

Dam Failure Flooding History and Frequency: There are no reported incidences of dam failure only spillway failures; there have been multiple instances where there have been evacuations downstream of dams as a precaution. In 1990, the village of Union Center, downstream of the Hillsboro dam, had to be evacuated due to the threat of a dam failure. In 2007 between 80-100 residents downstream from the Runge Hollow, Hidden Valley, Primmer and Seas Branch dams were evacuated as a precautionary measure. In June of 2008 and September of 2016 evacuations and road closures below the Yttri-Primmer, Seasbranch, Hidden Valley, Melby, Yttri-Primmer, Sidie Hollow, Duck Egg, Ostrem, Seasbranch, Runge Hollow, Raaum, Thompson, Eagles Park, Jacobson, Jersey Valley, and Hillsboro Dams. In August and September of 2018 there were two spillway failures, Jersey Valley and Mlsna, which resulted in evacuations downstream. There were also evacuations in Coon Valley and along County Road P due to a failure of a dam in Monroe County. Residents below the Hillsboro dam were also evacuated due to erosion around the dam creating a failure.

Dam Failure Flooding Vulnerability Assessment

In 1996 the Mississippi River Regional Planning Commission published a "Dam Hazard Assessment", for 42 Soil Conservation Service Public Law (PL) 566 dams in five western Wisconsin counties. Twenty-two dams in Vernon County were included in the study. Table 3-15 summarizes the findings of the study and the potential impact dam failures would have on Vernon County.

- Critical Facilities. In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Dam Failure Flooding a risk factor of 8 indicating this natural hazard is a low risk to the county. The "Dam Hazard Assessment" completed for twenty-two PL566 dams in Vernon County showed that no critical facilities are located in the hydraulic shadows of dams. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities. Hydraulic shadows of other dams in Vernon County are not known.
- Business and Industry. In Vernon County there are 630 businesses and industries. The Natural Hazard Risk Assessment assigns dam failure flooding a low risk factor in the county. The "Dam Hazard Assessment" completed for twenty-two PL566 dams in Vernon County showed that three businesses are located in the hydraulic shadows of dams. Hydraulic shadows of other dams in Vernon County are not known.
- Agriculture. In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. The Natural Hazard Risk Assessment assigns dam failure flooding a low risk factor in the county. The land below the dams is mostly agricultural and pastureland that would be subject to flooding in the rare occurrence a dam fails. The "Dam Hazard Assessment" completed for twenty-two PL566 dams in Vernon County showed that agricultural crops would be impacted in the rare occurrence that one of the dams fail. The most significant crop damage would occur if the Bad Axe 11 dam failed, as the report estimated that approximately \$230,000 (\$380,535 in 2018 dollars) in crop damage would be sustained (see Table 3-15). Hydraulic shadows of other dams in Vernon County are not known.
- Roads and Highways. Dam failure differs from traditional flooding in that flooding, even on a rapidly rising stream such as the Coon Creek happens both with a certain regularity in terms of not being an "if", but a "when", and also with a

certain advance warning, perhaps weeks for the Mississippi but none-the-less, there is a warning period to take action to close roads, move equipment, or other take other mitigation. A dam break on the other hand could leave little time, even in terms of minutes, to take any mitigation action. The “Dam Hazard Assessment” completed for twenty-two PL566 dams in Vernon County showed that several roads would be impacted in the rare occurrence that one of the dams fail. Six roads would be susceptible to damage if the W. Fork Kickapoo dam were to fail (see Table 3-15 for additional impacted roads). Hydraulic shadows of other dams in Vernon County are not known.

- Railroads There are two railroad lines in Vernon County. The Burlington Northern & Santa Fe Railway’s (BNSF) mainline between Chicago and the Twin Cities and the Iowa, Chicago & Eastern Railway lies along the Mississippi River. The risk factor is low for dam failure. The “Dam Hazard Assessment” completed for twenty-two dams in Vernon County showed that no railroads are located in the hydraulic shadows of the PL566 dams. Hydraulic shadows of other dams in Vernon County are not known.
- Airway. Viroqua and Hillsboro airports are the two public airports located Vernon County. The “Dam Hazard Assessment” completed for twenty-two dams in Vernon County showed that no airports are located in the hydraulic shadows of the PL566 dams. Hydraulic shadows of other dams in Vernon County are not known.
- Waterways. The hazard to commercial navigation on the Mississippi River from dam failures on tributaries is minute. In most cases the initial flush of water from a partial or complete failure of a PL566 dam on a tributary would not even reach the Mississippi in a noticeable form.
- Municipal Water. In the county there are 24 municipal wells and water systems, see Table 3-11. These facilities are usually located at higher elevation, which lessens their vulnerability to flooding or damage if a dam would fail. The “Dam Hazard Assessment” completed for twenty-two dams in Vernon County showed that no municipal water systems are located in the hydraulic shadows of the PL566 dams. Hydraulic shadows of other dams in Vernon County are not known.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities can be located in low-lying areas especially gravity type systems making them vulnerable to flooding in event that a dam fails. Floodwaters could infiltrate into the piping of the system that could result in the system operating over its capacity. The “Dam Hazard Assessment” completed for twenty-two dams in Vernon County showed that no wastewater treatment facilities are located in the hydraulic shadows of the PL566 dams. Hydraulic shadows of other dams in Vernon County are not known.
- Hazardous Material Sites. No major hazardous waste disposal or storage sites are located in the hydraulic shadows of PL566 dams. Most rural dwellings have fuel oil, bottled gas, gasoline, and other containers of various sizes mounted outdoors or in storage buildings. These containers need to be made secure from winds and flooding.

Dam Failure Flooding Risk Assessment Designation

Dam Failure Flooding Historical Occurrence Rating: Low - 1

Dam Failure Flooding Vulnerability Rating: Negligible - 2

Dam Failure Flooding Probability Rating: Unlikely - 3

Dam Failure Flooding Local Official Survey Rating: Low -9

Dam Failure Flooding Risk Assessment Designation: **Low Threat – 9 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Dam Failure Flooding Hazard Mitigation Ideas: • Have an inspection, maintenance and enforcement program in place to ensure the continued structural integrity of dams • Remove unnecessary or old and structurally unsound dams • Planning for dam breaks can include constructing emergency access roads as well as automating pump and flood gate operation • Regulate development in a dam’s hydraulic shadow, where flooding would occur if there were a severe dam failure • Develop and coordinate dam failure emergency action plans

3.7 Vernon County, Forest/Wildland Fire Risk Assessment

Forest/Wildland Fires Definition: A forest fire is an uncontrolled fire occurring in a forest or in woodlands outside the limits of incorporated villages or cities. A wildfire is any instance of uncontrolled burning in brush, marshes, grasslands or field lands. The causes of these fires include lightning, human carelessness and arson.

Forest and wildfires can occur at any time of the day and during any month of the year, but the peak fire season in Wisconsin is normally from March through November. The season length and peak months may vary appreciably from year to year. Land use, vegetation, amount of combustible materials and weather conditions such as wind, low humidity and lack of precipitation are the chief factors determining the number of fires and acreage burned. Generally, fires are more likely when vegetation is dry from a winter with little snow and/or a spring and summer with sparse rainfall.

Forest fires and wildfires are capable of causing significant injury, death and damage to property. A recent inventory showed that 46 percent of the state, 16 million acres is covered with forests. The potential for property damage from fire increases each year as more recreational properties are developed on wooded land and increased numbers of people use these areas. Fires can extensively impact the economy of an affected area, especially the logging, recreation and tourism industries. Major direct costs associated with forest fires or wildfires are the salvage and removal of downed timber and debris and the restoration of the burned area. If burned-out woodlands and grasslands are not replanted quickly to prevent widespread soil erosion, then landslides, mudflows and floods could result, compounding the damage.

Forest/Wildland Fires History and Frequency: No major forest fires have occurred in Vernon County in recent history.

The 1976 drought created the most severe fire danger condition in Wisconsin forests and grasslands since the 1930's. During 1976 a total of 4,144 fires occurred, the greatest number in any one-year since 1971, when detailed record keeping began. The fire season of 1988 is also remembered as one of the driest on record. A total of 3,242 fires occurred that year, but just 9,740 acres burned, an extraordinarily low number considering the severity of the threat. Department of Natural Resource records show that no major forest fires (*fires burning over 500 acres*) have been reported for Vernon County from 1976 through 2017. Vernon County does have mutual aid agreements between fire departments.

Because there have no major forest fires in Vernon County in recent years there are no records of damage to property or crops. Due to this it is difficult to give a dollar amount of future fires.

Forest/Wildland Fires Vulnerability Assessment

- Critical Facilities. In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Forest/Wildland Fires a risk factor of 8 indicating this natural hazard is a low risk to the county. Critical facility's vulnerability to Forest/Wildland Fires is very negligible. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- Business and Industry. In Vernon County there are 630 businesses and industries. For the majority of urban businesses and industries forest/wildland fires pose a low risk. Businesses and industries located in rural areas or those located adjacent to forests and grasslands may be at a more significant risk. Examples of businesses that would be more vulnerable to these natural disasters include campgrounds and other recreation facilities.
- Agriculture. The overall hazard risk to agriculture is low. Agricultural buildings, especially out buildings that may be adjacent to forests or grasslands have an increased vulnerability to forest/wildland fires. Crops that have sustained long periods of drought or crops at harvest time could be more susceptible to damage from fires. This natural hazard could also endanger livestock.
- Roads and Highways. Smoke from forest fires can adversely affect visibility for motorists, but this is an isolated occurrence. The movement of heavy and specialized firefighting equipment on public roadways to fire scenes can cause temporary disruption or inconvenience to the motoring public. Following a major forest or wildland fire, sufficient vegetation may have been destroyed so as to warrant consideration of temporary emergence soil erosion control methods. This would especially apply to steep slopes, such as along STH 35.
- Railroads. Smoke from forest fires can adversely affect visibility for train operation, but this is an isolated occurrence and can be mitigated by notification of the railroad dispatcher. A decision to close the railroad temporarily can be made by railroad management. Following a major forest or wildland fire, sufficient vegetation may have been destroyed so as to warrant consideration of temporary emergence soil erosion control methods.
- Airway. Although fires in the hardwood forests of Vernon County rarely reach the spectacular proportions of fires in the western state mountains, or even in the coniferous forests of northern Wisconsin, aircraft are sometimes used for observation, or water drops. During major fire events the Viroqua or Hillsboro airports could become major hubs of air and ground activity. Highway traffic control by local officers in the vicinity of the airports might be needed.

- Waterways. Although there are some historical accounts of navigation by steamboat on the Mississippi River during wildfires on adjacent bluffs, these accounts relate little in the way of direct threat to boats on the river. As with land and air transportation, there could be isolated incidents of smoke drift creating a visibility hazard to river boat pilots, but modern tow boats equipped with radar, are less apt to be impacted by this than are motorists on a highway.
- Municipal Water. In the county there are 20 municipal wells and waters systems in operation, see Table 3-11. These facilities vulnerability to forest/wildland fires would be negligible except if these facilities are located adjacent to forests. The services provided by these facilities would not be interrupted except in extreme cases.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities vulnerability to forest/wildland fires would be negligible except if these facilities were located adjacent to forests. The services provided by these facilities would not be interrupted except in extreme cases.
- Hazardous Material Sites. Hazardous material storage areas in the path of forest or wildland fire would have to either receive concentrated protection, at the expense of resources that could otherwise be devoted to the main task of fire suppression, or the material would have to be moved and transported to a pre-designated relocation site if there were sufficient advance warning and accurate prediction of the fire's path. This latter option is not very likely to present itself.

Forest/Wildland Fires Risk Assessment Designation

Forest/Wildland Fires Historical Occurrence Rating: Low - 1

Forest/Wildland Fires Vulnerability Rating: Negligible - 1

Forest/Wildland Fires Probability Rating: Possible - 3

Forest/Wildland Fires Local Official Survey Rating: Medium - 5

Forest/Wildland Fires Risk Assessment Designation: **Low Threat – 10 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Forest/Wildland Fires Hazard Mitigation Ideas:

- Outreach efforts can promote such items as non-combustible roof covering, fire safe construction, and the important of cleaning brush away from buildings
- Promote public education on smoking hazards and the risks of recreational fires
- Zoning can be used to cluster development into defensible areas and keep development away from fire hazards such as steep slopes, where fires are difficult to contain
- Damage potential can be reduced by ensuring that structures are surrounded by defensible space or buffer zones
- Local power companies can help prevent or alleviate wildfires by property maintenance and separation of power lines, as well as efficient response to fallen power lines
- Maintenance of property in or near wildfire prone areas (fuel management techniques, pruning/clearing dead vegetation, selective logging, planting fire-resistant vegetation, creating fire breaks)
- Local governments can require burn permits and restrict campfires and outdoor burning
- Establish or continue to maintain cooperative fire agreements with the Wisconsin Department of Natural Resources
- Smoke from forest fires can adversely affect visibility for motorists, but can be mitigated by temporary signage or even road closures in a temporary basis
- Following a major forest or wildland fire, sufficient vegetation may have been destroyed so as to warrant consideration of temporary emergence soil erosion control methods
- Develop a broadcast system to warn residents and tourists

3.8 Vernon County, Heavy Snowstorm Risk Assessment

Heavy Snowstorm Definition: Winter storms can vary in size and strength and include heavy snowstorms. A heavy snowfall is the accumulation of six or more inches of snow in a 12-hour period or eight or more inches in a 24-hour period.

Heavy Snowstorm History and Frequency:

1990's: 14 reported events by NCDC – 1/13/93, 1/16/94, 1/26/94, 2/22/94, 2/25/94, 3/6/95, 4/9/95, 11/26/95, 1/18/96, 12/23/96, 2/4/97, 3/13/97, 3/8/98, 1/1/99

2000's: 21 reported events by NCDC – 12/11/00, 12/18/00, 12/28/00, 3/1/02, 4/7/03, 12/9/03, 2/5/04, 1/4/05, 1/21/05, 3/17/05, 2/15/06, 2/23/07, 3/1/07, 4/10/07, 12/22/07, 2/17/08, 12/8/08, 12/19/08, 12/20/08, 12/8/09, 12/23/09.

2010's: 10 reported events by NCDC – 1/6/10, 12/3/10, 12/20/10, 3/5/13, 3/22/15, 12/10/16, 1/24/17, 3/12/17, 4/3/18 and 4/18/18.

Much of the snowfall in Wisconsin occurs in small amounts between one and three inches per occurrence. Heavy snowfalls that produce at least eight to ten inches accumulation happen on the average only five times per season. Southwestern Wisconsin

receives most of its snow during mid-winter. Snowfall in Wisconsin varies between the seasonal averages of approximately 30 inches in the south-central area of the state to over 100 inches a year in the extreme northwestern counties.

The National Climatic Data Center records show 14 heavy snowstorm events in Vernon County during the 1990's and 21 in the 2000's and 10 in the 2010's. Based on this data Vernon County can expect 1.6 winter storms, which produces at least 6" of snow per year. Estimating potential future losses for winter storms is difficult. Typically, damages are minor and widespread. Cost such as additional snow removal time and minor auto accidents are the typical costs associated with heavy snowstorms and are not usually tracked at the county level.

Heavy Snowstorm Vulnerability Assessment

- Critical Facilities. In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Heavy Snowstorm a risk factor of 29 indicating this natural hazard is a high risk to the county. In fact, this natural hazard received the highest risk assessment of hazards assessed for the county. Heavy snowstorms with large accumulations of snow could cause structural damage to the roofs of these buildings due to inadequate snow load capacity. In extreme cases, operations of these facilities could be limited because employees are unable to get to work. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- Business and Industry. In Vernon County there are 630 businesses and industries that employed 7,123 people and had an annual payroll of \$242 million, see Table 3-6. Heavy snowstorms with large accumulations of snow could cause structural damages to roofs of these buildings due to inadequate snow load capacity. Businesses and industries vulnerability to heavy snowstorms could include economic loss and disruptions of inputs and outputs in extreme cases.
- Agriculture. In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. Snow from snowstorms is beneficial to many crops because it provides insulation from freezing and extreme cold. Livestock can be vulnerable to heavy snowstorms and can cause injuries and death. Crop land with significant frost depth can be negatively impacted by heavy snow cover. Spring rains are needed to draw the frost out of the ground; otherwise the water from snow melt will not be absorbed by the soil and can cause severe runoff and flooding.
- Roads and Highways. Direct hazard caused by poor visibility and slippery surface. Safety concerns with snow plows. Following a heavy snowfall, visibility problems can persist with blowing snow and icing following partial melting and refreezing of the runoff water. Blowing snow is more apt to occur on north-south oriented roads such as STH 27 and USH 14/61. Following a heavy snowfall, children may be outside playing in the snow near the roadway and be oblivious to traffic. Following the snow deposition, lesser used roads may remain blocked for hours, or even days after the storm is over. This blockage can cause motorist confusion and circuitous detours, as well as hampering access for emergency vehicles. Finding locations to store snow, especially snow removed from large expanses like urban parking lots, can be challenging.
- Railroads. Direct hazard caused by poor visibility. Following a heavy snowfall, visibility problems can persist with blowing snow.
- Airway. Light plane operation from the Viroqua or Hillsboro airports would not be possible during a heavy snowstorm, because of the poor visibility and the physical blockage of the runway and taxiways. Following a heavy snowfall, visibility problems can persist with blowing snow and icing following partial melting and refreezing of the runoff water. Heavy snow squalls in the vicinity of Vernon County could cause some light aircraft, possibly flying over the county, to decide to land at Viroqua or Hillsboro until the storms stop.
- Waterways. The Mississippi River is typically closed from about the first week of December to the second week of March. Most heavy snowfalls occur in the winter when the Mississippi River is closed to navigation, and therefore present no challenge. Early heavy snows in early December or mid-March could catch an active tow still on the Upper River. The same conditions of poor visibility that affect road and rail travel can impact river pilots as well. Although commercial riverboats are equipped with radar, eyesight visibility is still critical to navigate through locks, and while performing barge transfers. Heavy snow makes conditions dangerous for deck personnel where a slip and fall can be fatal. Lock workers experience the same problem. There is one Corps of Engineers navigation lock, Lock and Dam 8, at the Village of Genoa.
- Municipal Water. In the county there are 20 municipal wells and water systems in operation, see Table 3-11. These facilities vulnerability to heavy snowstorms is negligible and would not cause interruption of services provided by these facilities.

- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities vulnerability to heavy snowstorms is negligible and would not interrupt services provided by these facilities.
- Hazardous Material Sites. Heavy snow does not have as great an impact on hazardous materials in storage as does some of the other natural hazards, but heavy snow could cause collapse of storage building roofs, as well as restricting the response of emergency crews to the scene.

Heavy Snowstorm Risk Assessment Designation

Heavy Snowstorm Historical Occurrence Rating: High - 9

Heavy Snowstorm Vulnerability Rating: Catastrophic - 7

Heavy Snowstorm Probability Rating: Highly Likely - 8

Heavy Snowstorm Local Official Survey Rating: High - 5

Heavy Snowstorm Risk Assessment Designation: **High Threat – 29 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Heavy Snowstorm Hazard Mitigation Ideas: • Local and state governments can produce and distribute family and traveler emergency preparedness information relating to severe winter weather hazards • Safety strategies for severe weather events can be included in driver education classes • Burying or otherwise protecting electric and other utility lines can prevent utility disruption • Local governments can impact building/site design through building code enforcement of snow-related ordinances such as snow loads, roof slope, snow removal, and storage • Establish heating centers or shelters for vulnerable populations • Local governments need to always plan for and maintain adequate road and debris clearing capabilities • Use snow fences to limit blowing and drifting of snow over critical roadway segments

3.9 Vernon County, Ice Storm Risk Assessment

Ice Storm Definition: Winter storms can vary in size and strength and include ice storms. An ice storm is an occurrence where rain falls from warmer upper layers of the atmosphere to the colder ground, freezing upon contact with the ground and exposed objects near the ground.

Freezing drizzle/freezing rain is the effect of drizzle or rain freezing upon impact on objects that have a temperature of 32 degrees Fahrenheit or below. Sleet is solid grains or pellets of ice formed by the freezing of raindrops or the refreezing of largely melted snowflakes. This ice does not cling to surfaces.

Both ice and sleet storms can occur at any time throughout the winter season from October into early April. Early and late season ice and sleet storms are generally restricted to northern Wisconsin; otherwise the majority of these storms occur in southern Wisconsin. In a typical winter there are 3-5 freezing rain events and a major ice storm occurs on a frequency of about once every other year. If a half inch of rain freezes on trees and utility wires, extensive damage can occur, especially if accompanied by high winds that compound the effects of the added weight of ice. There are also between three and five instances of glazing (less than ¼ inch of ice) throughout the state during a normal winter.

Ice Storm History and Frequency:

1970's:	1 event reported by Wisconsin Emergency Management – 3/76, devastating ice storm, \$8.5 million-Public Gov't Property and Facilities Damage and \$42 million Private-Individual Property, Crop and Facilities Damage to Vernon and 21 other counties, <i>Presidential Disaster Declaration</i> .
1990's:	4 events reported by NCDC – (1/26/94 heavy snow/ice storm); (12/13/95 glaze); 2/26/96; (1/4/98 Vernon & 11 other counties, \$67,000 PD, 14 injuries)
2000's:	5 events reported by NCDC – 2/24/01, 12/1/07, 1/3/09, 2/26/09, 3/8/09
2010's:	1 event reported by NCDC – 1/24/10

Wisconsin Emergency Management records show that in March of 1976 a devastating ice storm hit Vernon County along with 21 other counties, causing over \$50 million in property damage warranting a Presidential Disaster Declaration. The National Climatic Data Center reported that Vernon County experienced four ice storm events in the 1990's and 6 events between 1/1/00 and 12/31/10. Damages and costs typically associated with Ice Storms are downed power lines, auto accidents and additional personnel time for salting and plowing. Estimating future losses is difficult due to the fact that most costs associated with Ice Storms are not tracked at the County level.

Ice Storm Vulnerability Assessment

- Critical Facilities. In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Ice Storm a risk factor of 23 indicating this natural hazard is a high risk to the county. Ice storms can damage the roofs of these facilities by forming "ice dams" and in severe conditions the weight of the ice from these storms can cause roofs to collapse. Ice storms can damage power and communication lines and cut off service to these buildings. Services provided by these facilities would not be interrupted except in extreme cases. See Table 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- Business and Industry. In Vernon County there were 630 businesses and industries that employed 7,123 people and had an annual payroll of \$242 million, see Table 3-6. Ice storms can damage the roofs of these buildings by forming "ice dams" and in severe conditions the weight of the ice from these storms could cause roofs to collapse. Ice storms can damage power and communication lines and cut off service to buildings resulting in lost production and revenue from businesses and industries. Agricultural-related businesses and industries could suffer economic losses from crop damages, reduced milk production and loss of livestock due to ice storms.
- Agriculture. In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. The hazard threat from ice storms is high in the county. The agricultural economy can sustain substantial economic losses from these storms. Ice storms can damage and collapse the roofs of buildings and can damage power and communication cutting off service to these buildings. The dairy industry in particular is vulnerable to ice storms because these operations are dependent on electric milking equipment that could result in reduced production and extreme cases milk may have to be dumped. This natural hazard can result in the loss of livestock due to exposure and increase crop damages. Christmas tree farms and fruit tree orchards can suffer damages due to ice sheared treetops, branches pulled down and destruction of trees. The gathering of sap for maple syrup production can be halted due to ice covering tree spigots and gathering systems during sap runs. Rural areas can be the last to get electrical power restored from downed lines to farms.
- Roads and Highways. Ice is one of the more treacherous hazards to roadway travel. It is not always as plainly obvious on the surface as is snow, and in spotty icing conditions, a vehicle can come upon it unexpectedly on a curve or the bottom of a hill, even though other parts of the highway are clear. Motorists tend to expect icing on bridges. Heavy ice can cause tree limbs or utility lines to fall across the roadway.
- Railroads. The main impact ice storms have on railroad movement is their potential to disrupt wire-based communications if the wires are weighted down and break. Icing can cause obvious productivity and safety hazards to rail crews working on the ground, as in necessary to switch cars at customer sidings or in rail sorting yards.
- Airway. Icing on wings and elsewhere on the exterior of an aircraft make it impossible to fly. Light planes in flight may have to make emergency landings at Viroqua or Hillsboro if they encounter icing in flight. Aircraft parked in the open on the ground could have their control surfaces damaged by heavy ice storms.
- Waterways. Ice storms can occur earlier and later in the winter season than do severe snow storms, and the most typical time for ice storms is in November and March. Commercial navigation can still be in full operation at the time of an ice storm. Deck surface conditions can be very treacherous for deck hands working on barge tows and for workers at navigation locks and cargo piers.
- Municipal Water. In the county there are 20 municipal wells and water systems in operation, see Table 3-11. These facilities vulnerability to ice storms would be limited to such things as damage to the facility's roofs and loss of electrical service from downed power lines. Services provided by these facilities would not be interrupted except in extreme cases.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in the county, see Table 3-12. These facilities vulnerability to ice storms would be limited to such things as damage to building's roofs and loss of electrical service from downed power lines. Services provided by these facilities would not be interrupted except in extreme cases.
- Hazardous Material Sites. Ice, like snow, is more harmful for the potential peripheral impacts than direct impact. Icy road conditions can make emergency vehicle response difficult.

Ice Storm Risk Assessment Designation

Ice Storm Historical Occurrence Rating: Moderately Low - 4

Ice Storm Vulnerability Rating: Catastrophic - 7

Ice Storm Probability Rating: Likely - 5

Ice Storm Local Official Survey Rating: High - 7

Ice Storm Risk Assessment Designation: **High Threat – 23 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Ice Storm Hazard Mitigation Ideas: • Local and state governments can produce and distribute family and traveler emergency preparedness information relating to severe winter weather hazards • Burying or otherwise protecting electric and other utility lines can prevent utility disruption • Local governments need to always plan for and maintain adequate road and debris clearing capabilities • Home and building maintenance should be encouraged in order to prevent roof and wall damage from “ice dams”

3.10 Vernon County, Blizzard Risk Assessment

Blizzard Definition: Winter storms can vary in size and strength. A blizzard is the occurrence of sustained wind speeds in excess of 35 miles per hour accompanied by heavy snowfall or large amounts of blowing or drifting snow. True blizzards are rare in Wisconsin, however blizzard-like conditions often exist during heavy snowstorms when gusty winds cause severe blowing and drifting of snow.

Blizzard History and Frequency:

1990's: 1 event reported by NCDC – 1/26/96

2000's: No events reported by NCDC

2010's: 1 event reported by NCDC – 12/11/10

Two blizzard events were recorded by the National Climatic Data Center for Vernon County. One in 1996 and the other in 2010.

Blizzard Vulnerability Assessment

- **Critical Facilities.** In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Blizzard a risk factor of 17 indicating this natural hazard is a moderate threat to the county. Blizzards with heavy snowfalls and strong wind speeds could cause structural damage to roofs of these facilities because of inadequate snow load capacity. Roofing material could be blown off. Electrical service may be interrupted. Operations of these facilities could be limited because employees are unable to get to work. The services of these facilities provided would not be interrupted except in extreme cases. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- **Business and Industry.** In Vernon County there are 630 businesses and industries that employed 7,123 people and had a payroll of \$242 million, see Table 3-6. Blizzards with heavy snowfalls and strong wind speeds could cause structural damage to buildings because of inadequate snow load capacity. Roofing material could be blown off. Businesses and industries' vulnerability to blizzards could include economic loss and disruption of inputs and outputs.
- **Agriculture.** In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. Snow from blizzards is beneficial to many crops because it provides insulation from freezing and extreme cold. Livestock can be vulnerable to exposure from strong and persistent winds and the heavy snowfall with drifting which can cause injuries and death. The strong winds that accompany blizzards can cause soil erosion of soil especially on ridge tops.
- **Roads and Highways.** The same problem created by heavy snowfall applies to blizzards as well, except blizzards are characterized by heavy winds in addition to snow. Direct hazards caused by poor visibility and slippery surface are safety concerns with snow plows. Following a heavy snowfall, visibility problems can persist with blowing snow and icing following partial melting and refreezing of the runoff water. Blowing snow is more apt to occur on north-south oriented roads such as STH 27 and USH 14/61. Following a heavy snowfall, children may be outside playing in the snow near the roadway and be oblivious to traffic. Following the snow deposition, lesser used roads may remain blocked for hours, or even days after the storm is over. This blockage can cause motorist confusion and circuitous detours, as well as

hampering access for emergency vehicles. Finding locations to store snow, especially snow removed from large expanses like urban parking lots, can be challenging.

- Railroads. Direct hazard caused by poor visibility. Following a heavy snowfall, visibility problems can persist with blowing snow.
- Airway. Light plane operation from the Viroqua or Hillsboro airports would not be possible during a heavy snowstorm, because of the poor visibility and the physical blockage of the runway and taxiways. Following a heavy snowfall, visibility problems can persist with blowing snow and icing following partial melting and refreezing of the runoff water. Heavy snow squalls in the vicinity of Vernon County could cause some light aircraft, possibly flying over the county, to decide to land at Viroqua or Hillsboro until the storms stop.
- Waterways. The River is closed to commercial navigation from about the first week of December to the second week of March. Most heavy snowfalls occur in the winter when the Mississippi River is closed to navigation, and therefore present no challenge. Early heavy snows in early December or mid-March could catch an active tow still on the Upper River. The same conditions of poor visibility that affect road and rail travel can impact river pilots as well. Although commercial riverboats are equipped with radar, eye-sight visibility is still critical to navigate through locks, and while performing barge transfers. Heavy snow makes conditions dangerous for deck personnel where a slip and fall can be fatal. Lock workers experience the same problem. There is one Corps of Engineers navigation lock, Lock and Dam 8 located at the Village of Genoa.
- Municipal Water. In the county there are 20 municipal wells and water systems in operation, see Table 3-11. These facilities vulnerability to blizzards is negligible and would not be interrupted except in extreme cases.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities vulnerability to blizzards is negligible and would not interrupt services provided by these facilities.
- Hazardous Material Sites. Heavy snow does not have as great an impact on hazardous materials in storage as does some of the other natural hazards, but heavy snow could cause collapse of storage building roofs, as well as restricting the response of emergency crews to the scene.

Blizzard Risk Assessment Designation

Blizzard Historical Occurrence Rating: Low - 2

Blizzard Vulnerability Rating: Catastrophic - 7

Blizzard Probability Rating: Possible - 3

Blizzard Local Official Survey Rating: High - 5

Blizzard Risk Assessment Designation: **Moderate Threat – 17 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Blizzard Hazard Mitigation Ideas: • Local and state governments can produce and distribute family and traveler emergency preparedness information relating to severe winter weather hazards • Burying or otherwise protecting electric and other utility lines can prevent utility disruption • Local governments need to always plan for and maintain adequate road and debris clearing capabilities • Use snow fences to limit blowing and drifting of snow over critical roadway segments

3.11 Vernon County, Extreme Cold Risk Assessment

Extreme Cold Definition: Winters are often accompanied with extremely cold temperatures. Extremely cold temperatures with strong winds can result in wind chills that cause bodily injury such as frostbite and death.

Extreme Cold History and Frequency:

1990's: 5 reported events by NCDC: 1/13/94, 12/9/95, 1/29/96, 2/1/96, (1/16/97 wind chills of 30-50 below zero)

2000's: 6 reported events by NCDC: 1/30/08, 2/10/08, 12/14/08, 12/21/08, 1/14/09 and 12/10/09.

2010's: 4 reported events by NCDC: 1/1/10, 3/7/13, 1/5/14 and 1/27/14.

The National Climatic Data Center reported that Vernon County experienced 5 extreme cold events in Vernon County during the 1990's, 6 events in the 2000's and 4 events in 2010's. This averages out to about one every other year. Damages associated with extreme cold temperatures include frostbite and even death. No deaths have been recorded in Vernon County due to extreme cold temperatures.

Extreme Cold Vulnerability Assessment

- Critical Facilities. In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Extreme Cold a risk factor of 20 indicating this natural hazard is a moderate risk to the county. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- Business and Industry. In Vernon County there are 630 businesses and industries that employed 7,123 people and had a payroll of \$242 million, see Table 3-6. Extreme cold can lead to physical problems for workers (frostbite) and lower productivity. The extreme cold can cause mechanical equipment failures which could lead to economic loss and disruption of inputs and outputs.
- Agriculture In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. Extreme cold can cause dangerous physical conditions (frostbite) for agricultural workers. Livestock can be vulnerable to exposure from cold temperatures causing more stress on the animal and less production. In addition, extreme cold can cause injuries and death. Equipment failures such as frozen water pipes, fuel lines, etc. can disrupt agricultural production.
- Roads and Highways. Extreme cold impacts highway transportation by creating problems with vehicle starting and operation. Fuels lines and cooling systems can freeze, door latches not work properly, and other mechanical components can fail. The problem of extreme cold is compounded by the fact the roadways usually are already impacted by snow and ice from previous snowstorms. There is a safety hazards to individual motorists if they have any vehicle mechanical problems, or a driving situation that forces them into the ditch or situation where the vehicle is inoperative. Exposure injury, or death, either in or out of the vehicle, can occur quickly. Adverse impact to the road infrastructure can include contraction of bridge joints; contribute to rock face collapse, and pavement cracking.
- Railroads. Extreme cold causes contraction of welded continuous rails, and the imposition of a speed limit by the railroad companies. This speed reduction would impact operations on some railroads. The mechanical components of locomotives, rail cars, and railroad crossing gates can be adversely impacted by extreme cold. The extreme cold can impact railroad operating and maintenance crew's personal safety if they are exposed to the temperatures.
- Airway. Extreme cold can adversely impact all of the mechanical components of a light aircraft, including the engine and control surfaces. Planes in flight during extreme cold periods can experience engine icing.
- Waterways. Extreme cold events would most likely only occur during periods of the year when commercial navigation on the Mississippi River would be seasonally closed. Recreational boaters in airboats, or recreationists crossing the Mississippi River in snowmobiles could be subject to extreme hazard if they became stranded in an inaccessible area due to mechanical failure or other cause.
- Municipal Water. In the county there are 20 municipal wells and water systems in operation, see Table 3-11. The water systems are at slight risk to extreme cold temperatures as water mains are more susceptible to problems (frozen water lines) but service interruption would be minimal except in extreme cases.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities vulnerability to extreme cold is negligible and would not interrupt services provided by these facilities.
- Hazardous Material Sites. Depending upon the type of material involved, there could be problems from the material escape if the containers or piping rupture during extreme cold.

Extreme Cold Risk Assessment Designation

Extreme Cold Historical Occurrence Rating: Moderately Low - 4

Extreme Cold Vulnerability Rating: Catastrophic - 7

Extreme Cold Probability Rating: Likely - 5

Extreme Cold Local Official Survey Rating: Medium/High - 4

Extreme Cold Risk Assessment Designation: **Moderate Threat – 20 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Extreme Cold Hazard Mitigation Ideas: • Local governments can organize outreach to vulnerable populations during periods of extreme temperature • Communities can encourage utility companies to offer special arrangements for paying heating bills • A community can establish heating and/or cooling centers for vulnerable populations

3.12 Vernon County, Earthquake

Earthquake Definition: An earthquake is a shaking or sometimes violent trembling of the earth that results from the sudden shifting of rock beneath the earth's crust. This sudden shifting, releases energy in the form of seismic waves or wave-like movement of the earth's surface. Earthquakes can strike without warning and may range in intensity from slight tremors to great shocks. They can last from a few seconds to over five minutes and they may also occur as a series of tremors over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties mostly result from falling objects and debris, caused by the shocks, shaking, and damage or demolition of buildings and other structures. Disruption of communications, electrical power supplies and gas, sewer and water lines should be expected. Earthquakes may trigger fires, dam failures, landslides or releases of hazardous material, compounding their disastrous effects.

Earthquakes are measured by two principal methods: seismographs and human judgment. The seismograph measures the magnitude of an earthquake and interprets the amount of energy released on the *Richter scale*, a logarithmic scale with no upper limit. This amount is expressed in Arabic numbers and each unit of increase represents a ten-fold increase in magnitude. An earthquake measuring 6.0 on the Richter scale is ten times more powerful than a 5.0 and one hundred times more powerful than an earthquake, measuring 4.0. This is a measure of the absolute size or strength of an earthquake and does not consider the effect at any specific location. The *Modified Mercalli Intensity Scale* is an intensity scale expressed in Roman numerals, which reports the amount of shaking and effects at a specific location based on expert judgment. The scale has twelve classes and ranges from I (not felt) to XII (total destruction). No occurrence of earthquakes in Wisconsin has been severe. The most serious recorded earthquake registered 5.1 on the Richter scale and had a maximum intensity on the Mercalli Scale of VII.

Earthquake History and Frequency: No major earthquakes have occurred in Vernon County in recent history.

Earthquake Vulnerability Assessment

- **Critical Facilities.** In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Earthquake a risk factor of 12 indicating this natural hazard is a low threat to the county. Earthquakes can range from nothing felt to total destruction and loss of life. Since no major earthquakes have occurred in Wisconsin or Vernon County in recent history the risk to these facilities is insignificant. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- **Business and Industry.** In Vernon County there are 630 businesses and industries that employ 7,123 people and had an annual payroll of \$242 million, see Table 3-6. Businesses vulnerability to earthquakes can range from nothing felt to total destruction and loss of life. Since not major earthquakes have occurred in Wisconsin or Vernon County the risk to businesses is insignificant.
- **Agriculture.** In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. Agriculture vulnerability to earthquakes is negligible.
- **Roads and Highways.** Earth movement can cause obvious incongruities with the roadway, as well as secondary damage due to related landslides, broken utility lines, and collapsed buildings on the roadway. This secondary damage of landslides would be most severe on roads in rock cuts, or cliffs, or any of the roads leading ridge tops. Broken water or sewer lines could present the biggest problem in the eleven incorporated communities. Broken gas mains would present the greatest danger of fire and explosion, especially in the vicinity of downed power lines that are creating sparks.
- **Railroads.** Earth movement can cause obvious incongruities with railroad lines, as well as secondary damage due to landslides along the Mississippi River. Even a slight shift in the earth's surface can cause switches to not properly align, and a slight tremor could cause a parked rail car to move if the brakes were not properly set.
- **Airway.** Earth movement could cause parked planes to shift position, and in severe, but unlikely, movement, to smash into one another. Underground fuel tanks could rupture. Hangers and other structures could be damaged. Obviously, an earthquake would have no direct effect on an airborne aircraft, but runway damage could occur, with rutting or furrowing affecting the unsuspecting pilot upon landing.
- **Waterways.** An earth tremor could cause wave action, and possibly temporary current reversal on even a large river like the Mississippi. If the event should occur during the active commercial navigation season the problems caused could include, moored barges breaking free, tows running aground, and lock chamber doors becoming jammed and inoperative.
- **Municipal Water.** In the county there are 20 municipal wells and water systems in operation, see Table 3-11. These facilities vulnerability is negligible and would not interrupt services provided by the facilities except in extreme cases.

- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities vulnerability to earthquakes is negligible and would not interrupt services provided except in extreme cases.
- Hazardous Material Sites. Industrial operations that require the piping of hazardous material to various locations in the storage or manufacturing process are most prone to earth tremor damage in that the pipes could break during the tremors. Material stored in tanks or other containers is always prone to the containers falling or being hit by debris, and breaking, resulting in the release of the material.

Earthquake Risk Assessment Designation

Earthquake Historical Occurrence Rating: Low - 1

Earthquake Vulnerability Rating: Catastrophic - 7

Earthquake Probability Rating: Possible - 3

Earthquake Local Official Survey Rating: Low - 1

Earthquake Risk Assessment Designation: **Low Threat – 12 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Earthquake Hazard Mitigation Ideas: • Information gained from seismic hazard mapping can be used to assess risk • State and local highway departments should review construction plans from all bridges to determine their susceptibility to collapse • Local or state governments can use community outreach activities to foster an awareness of earthquake mitigation activities • Earthquake hazards can be mitigated through land use planning • Encourage local governments to adopt and enforce updated building code provisions is one effective way to reduce earthquake damage risk

3.13 Vernon County, Extreme Heat Risk Assessment

Extreme Heat Definition: A heat wave is primarily a public health concern. During extended periods of very high temperatures or high temperatures of humidity, individuals can suffer a variety of ailments including heat exhaustion and heat stroke. Heat stroke in particular is a life-threatening condition that requires immediate medical attention. In addition to posing a public health hazard, periods of excessive heat usually result in high electrical consumption for air conditioning, which can cause power outages and brown outs. The majority of deaths during a heat wave are the result of heat stroke. The elderly, disabled and debilitated are especially susceptible to heat stroke.

Heat is the number one weather-related killer in the United States and Wisconsin far exceeding tornadoes, severe storms and floods combined. According to the National Weather Service during the period of 1988-2017, extreme heat and humidity associated with heat waves killed an average of 134 people a year in the United States. Within the State of Wisconsin, the National Weather Service Milwaukee/Sullivan Office reports that since 1982 the State has averaged 5 deaths per year in which heat was the direct or primary cause. Since 1982 heat waves have been responsible for more deaths in Wisconsin than all other natural disasters combined.

In 1995, two major killer heat waves affected most of Wisconsin, resulting in 154 heat-related deaths and over 300 heat-related illnesses. In the summer of 2011, Wisconsin lost five people to heat-related illnesses during the July 18-22 heat wave. In 2012, Wisconsin had confirmed 27 heat related deaths, most occurred during five days of Excessive Heat Warnings from July 2-6. The heat index rose to 105 F degrees for 48 hours with night time lows of 75 F. It was the second hottest and third longest heat wave in Wisconsin. In 2013, 11 Wisconsin residents suffered heat-related death. The 1995 heat wave caused more deaths than any other weather-related event in the history of Wisconsin. Other recent heat waves include the summer of 1999 which claimed 20 lives and the summer of 2001 in which 15 people died.

Extreme Heat History and Frequency:

1990's: 6 reported events by NCDC: 6/14/94, 7/13/95 (57 deaths in state), 10/12/95, 7/4/99–7/5/99, 7/23/99, 7/28/99

2000's: 1 reported event by NCDC: 7/31/01 through first week and a half of August

2010's: 2 reported events by NCDC: 7/17/11 (\$8,000 PD) and 6/29/18

The National Climatic Data Center reported that Vernon County experienced 6 extreme heat events during the 1990's, one event in 2001 and 2 events in the 2010's. The National Weather Service records show that between 1982 and 2001 Vernon County experienced 42 heat wave days. Southwestern Wisconsin logged the most heat wave days during this time period. Damages associated with extreme heat are difficult to estimate, as amounts directly related to extreme heat are not tracked at the county level. Most damages which occur are additional costs associated with the additional power consumption by air conditioning and the costs associated with medical responses to heat strokes.

Extreme Heat Vulnerability Assessment

- Critical Facilities. In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns extreme heat a risk factor of 22 indicating this natural hazard is a high risk to the county. See Tables 3-9 through 3-16 and Maps 3-1 through 3-5 for further information and location of these facilities.
- Business and Industry. In Vernon County there are 630 businesses and industries that employed 7,123 people and had a payroll of \$242 million, see Table 3-6. Extreme heat can lead to physical problems for workers (heat exhaustion) and lower productivity. The extreme heat can cause mechanical equipment failures which could lead to economic loss and disruption of inputs and outputs.
- Agriculture. In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. Extreme heat can cause dangerous physical conditions (heat exhaustion) for agricultural workers. Livestock can be vulnerable to extreme heat causing more stress on the animal and less production. In addition, severe heat can cause injuries and death. Equipment failures due to overheating could disrupt agricultural production.
- Roads and Highways. High heat does not present as direct a threat to transportation in general than do some other natural hazards such as blizzards or extreme cold, however heat can have many side impacts, such as the safety and comfort of people and livestock having to endure the condition without air conditioning. Motor vehicles may overheat and stall in unsafe locations at highway intersections, fuel stored, illegally, in vehicle trunks or truck beds is more apt to volatilize and cause safety problems. Extreme heat can cause asphalt road surface buckling and rough bumps and cracks. Extreme heat can cause dangerous working conditions for highway maintenance workers outdoors or in poorly ventilated or non airconditioned shop buildings.
- Railroads. Extreme heat can cause buckling and kinking of welded continuous steel rails. Extreme heat can cause dangerous working conditions for track and other rail maintenance workers outdoors or in poorly ventilated or non airconditioned shop buildings.
- Airway. Extreme heat can cause volatilization of fuel in aircraft parked outside. Extreme heat can cause changes in atmospheric pressure and in the lift characteristics of small aircraft that a pilot must be aware of and compensate for.
- Waterways. The biggest impact of extreme heat on commercial navigation is apt to be the danger of heat exhaustion to deck crews working outdoors. Hot weather could increase the number of pleasure craft operating on the Mississippi River and result in increased conflict with safe navigation.
- Municipal Water. In the county there are 20 municipal wells and water systems in operation, see Table 3-11. These facilities vulnerability is negligible and would not interrupt services provided by the facilities except in extreme cases. In extreme cases water usage may increase to the point where the water system supply may be stressed.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities vulnerability to extreme heat is negligible and would not interrupt services provided except in extreme cases.
- Hazardous Material Sites. Hazardous material of various types could volatilize in extreme heat, especially if safety relief valves were not operating properly.

Extreme Heat Risk Assessment Designation

Extreme Heat Historical Occurrence Rating: Moderately High - 6

Extreme Heat Vulnerability Rating: Catastrophic - 7

Extreme Heat Probability Rating: Possible - 5

Extreme Heat Local Official Survey Rating: Medium - 4

Extreme Heat Risk Assessment Designation: High **Threat - 22 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Extreme Heat Hazard Mitigation Ideas: • Local governments can organize outreach to vulnerable populations during periods of extreme temperature • Communities can encourage utility companies to offer special arrangements for paying utility bills • A community can establish heating and/or cooling centers for vulnerable populations.

3.14 Vernon County, Agricultural Risk Assessment

Agricultural Definition: Agriculture is the science or art of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation of these products for man's use - *Webster's New Collegiate Dictionary*. For more than 150 years, agriculture has driven the State of Wisconsin's economy. It remains the number one industry in Wisconsin, employing one of every five people. The 2012-2016 American Community Survey 5-year Estimate showed that approximately 8.3% of Vernon County's employed civilian population was employed in the Agriculture, forest, fishing and hunting and mining sector.

There are many natural hazards that can affect agricultural production in the State. Droughts reduce crop growth and yields and can decimate croplands. Extreme temperatures, high winds, hail and other extreme weather conditions can also decimate crop production. Insects can also decimate a crop resulting in a total loss. Animal diseases in farm animals carry the potential of harming not only the animals' health, but also human health in some cases. Agricultural losses from floods include crop loss, soil erosion or property damage to farm structures and equipment. These are just some of the hazards that may affect agriculture.

Agricultural History and Frequency: The history of agricultural losses due to droughts, floods, extreme temperatures, high winds, and hail are detailed under the appropriate natural hazard section.

There are many natural hazards that can affect agricultural production (droughts, floods, extreme temperatures, high winds, hail, insects etc.) to name a few. Agricultural hazards can occur annually in the county.

Agricultural Vulnerability Assessment

- Critical Facilities. In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Agriculture a risk factor of 12 indicating this natural hazard is a low risk to the county. Critical facility's vulnerability to agriculture is not applicable. See Table 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- Business and Industry. In Vernon County there are 630 businesses and industries that employ 7,123 people, see Table 3-6. For most businesses and industries, vulnerability to agriculture production and raising of livestock would be negligible. Businesses and industries that are involved in the growth, production, processing, manufacturing, distribution and wholesale and retail sales of agricultural products and food products can be vulnerable to crop and livestock losses. These businesses and industries can sustain economic losses from reduced production of agricultural commodities due to damages caused by natural hazards.
- Agriculture In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. Agriculture productions is vulnerable to numerous natural hazards including droughts, floods, extreme temperatures, high winds, hail etc. and are detailed under the appropriate hazard section.
- Roads and Highways, Railroads, and Waterways. Unlike the other risks outlined in this section, agricultural risk is not a natural hazard, but rather an economic condition created by the occurrence of natural hazards. If any result would occur from agricultural risk, or crop failure, to impact transportation modes, it would be a reduction in truck, train, and barge traffic due to less grain being produced to haul. Ultimately an import of hay or other livestock feed into the area could result.
- Airway. Agricultural risk is an economic condition, not a natural hazard. There would be no direct threat to the airports or air travel.
- Municipal Water. In the county there are 20 municipal wells and water systems in operation, see Table 3-11. These facilities vulnerability to agriculture is not applicable.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities vulnerability to agriculture is not applicable.

- **Hazardous Material Sites.** If the agricultural risk is brought about because of severe drought, then it is likely natural weather conditions and ground cover condition is also conducive to the danger of wild fire. The same threat caused by fire would be possible. If the agricultural risk is caused by a shift in market conditions, or severe insect or disease infestation, the wildfire threat would not be as high.

Agricultural Risk Assessment Designation

Agricultural Historical Occurrence Rating: Low - 2

Agricultural Vulnerability Rating: Limited - 3

Agricultural Probability Rating: Possible - 3

Agricultural Local Official Survey Rating: Medium - 4

Agricultural Risk Assessment Designation: **Low Threat – 12 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Agricultural Hazard Mitigation Ideas: Agricultural Hazard Mitigation Ideas for droughts, floods, extreme temperatures, high winds, and hail are detailed under the appropriate natural hazard section.

3.15 Vernon County, Drought Risk Assessment

Drought Definition: A drought is an extended period of unusually dry weather, which may be accompanied by extreme heat (temperatures which are 10 or more degrees above the normal high temperature for the period). There are basically two types of drought in Wisconsin, agricultural and hydrologic. Agricultural drought is a dry period of sufficient length and intensity that markedly reduces crop yields. Hydrologic drought is a dry period of sufficient length and intensity to affect lake and stream levels and the height of the groundwater table. These two types of drought may but do not necessarily, occur at the same time.

Wisconsin is most vulnerable to agriculture drought. The state has about 15 million acres of farmland on 78,000 farms and was ranked 9th in the country in overall farm receipts (USDA, Economic Research Service). Even small droughts of limited duration can significantly reduce crop growth and yields, adversely affecting farm income. More substantial events can decimate croplands and result in total loss, hurting the local economy. Droughts also greatly increase the risk of forest fires and wildfires because of the extreme dryness. In addition, the loss of vegetation in the absence of sufficient water can result in flooding, even from average rainfall, following drought conditions.

Drought History and Frequency:

1970's:	1 event report by Wisconsin Emergency Management, 1976, \$1 million-Public Gov't Property and Facilities Damage and \$623 million Private-Individual Property, Crop and Facilities Damage to Vernon and 63 other counties, Presidential Emergency Declaration.
1980's	1 event report by Wisconsin Emergency Management, <i>Hazard Analysis, November 2002</i> - One of the most severe droughts on record for the state - 1987-1998 drought resulted in 52% of the state's 81,000 farms having a crop loss of 50% or more. All Wisconsin counties were designated eligible for drought assistance.
1990's	No events reported
2000's	No events reported
2010's	2 events reported by NCDC: 7/12 thru 10/12 and 9/13 thru 10/13

Wisconsin Emergency Management reported one major drought event (1976) which affected Vernon and 63 other counties in the State. A Presidential Emergency Declaration was made for those counties. According to *Wisconsin Emergency Management's Hazard Analysis, 2016*, Wisconsin's five most significant droughts in terms of severity and duration are: 1987-1989, 1976-1977, 1955-1959, 1948-1950 and 1929-1934.

Drought Vulnerability Assessment

- **Critical Facilities.** In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Drought a risk factor of 14 indicating this hazard is a moderate threat to the county. In drought situations, water use may be restricted and affect the operation of these facilities. Hospitals may need water

storage systems in emergency situations. Fire stations need adequate water capacity to fight fires. Critical facility's vulnerability to droughts is negligible and won't interrupt services provided by these facilities except in extreme cases. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.

- **Business and Industry.** In Vernon County there are 630 businesses and industries that employ 7,123 people and have an annual payroll of approximately \$242 million, see Table 3-6. For most businesses and industries, vulnerability to drought would be negligible. Examples of businesses and industries that are negatively impacted by drought conditions include: agribusinesses, tourism related businesses, boat dealerships and marinas, golf courses, businesses that rely on barge traffic for shipment of raw materials or transporting finished goods and products, and fisheries.
- **Agriculture.** In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. Agriculture's vulnerability to drought can be catastrophic. One of the most severe droughts in the state occurred in 1987-1988 which resulted in 52% of the state's 81,000 farms had crop losses of 50% or more. All Wisconsin counties were designated eligible for drought assistance. The costs and losses to agriculture producers can include: reduced yields and crop loss, increased insect infestation and plant disease, increased irrigation, cost of new or supplemental water resource development, wind erosion of top soil, forced reduction of foundation stock, reduced milk production, increased feed costs, high livestock mortality rates, disruption of reproductive cycles, decreased stock weights, reduced productivity of pastureland and loss of farms and dairy herds.
- **Roads and Highways, Railroads, and Waterways.** The impact of drought on transportation modes is much the same as that caused by agricultural failure; a reduction in agriculturally related freight traffic.
- **Airway.** Extended drought could increase the possibility of wildfires. The possible impact of wildfires on the Viroqua and Hillsboro airports, and on light plane travel has been discussed under that topic.
- **Municipal Water.** In the county there are 20 municipal wells and water systems in operation, see Table 3-11. Municipal water vulnerability to droughts can include decreased supply of water from low water tables and increased pollutant concentrations. Services from these facilities should not be interrupted except in extreme cases.
- **Wastewater Treatment Facilities.** There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities vulnerability to droughts can include decreased water supply and diminished sewage flows. Services from facilities should not be interrupted except in extreme cases.
- **Hazardous Material Sites.** Extended drought could increase the possibility of wildfires. The possible impact of wildfires on hazardous material sites has been discussed under that topic.

Drought Risk Assessment Designation

Drought Historical Occurrence Rating: Low - 2

Drought Vulnerability Rating: Critical - 5

Drought Probability Rating: Possible - 3

Drought Local Official Survey Rating: Medium - 4

Drought Risk Assessment Designation: **Moderate Threat – 14 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Drought Hazard Mitigation Ideas: • Citizens can be encouraged to take water-saving measures, especially when extra water is needed for irrigation and farming • Maintain adequate water storage for human consumption • Communities can pass ordinances to prioritize or control water use, particularly for emergency situations • Contingency plans can be developed to help anticipate needs and actions to take during a drought • Designs or plans for water delivery systems can include consideration of drought events • Crop insurance can preserve economic stability for farmers during a drought

3.16 Vernon County, Fog Risk Assessment

Fog Definition: Simply, fog is a cloud near the ground. A cloud is an area of condensed water droplets (or ice crystals in the upper atmosphere). The same processes that produce clouds high above the ground can produce clouds near the surface. Therefore, understanding fog requires some basic meteorology. Fog forms when air can no longer hold all of the moisture it contains. This happens when 1) air is cooled to its dew point, which is the temperature at which air is holding as much moisture as it can (cool air can hold more moisture than warm air) or 2) the amount of moisture in the air increases. Once air has reached its dew point, it condenses onto very small particles forming tiny water droplets that comprise fog.

Fog is a hazard mostly for one very important reason: reduced visibility. Airport delays, automobile accidents, shipwrecks, plane crashes, and many other transportation problems are frequently caused by fog. However, like several other natural hazards, fog can also be beneficial. Several species of plants, including some crops, depend on fog for moisture and cool temperatures from decreased sunlight.

Fog History and Frequency:

2010's: 2 events reported by NCDC – 12/29/10, 01/11/13

Fog is responsible for an average of over \$1 million in property damage, dozens of injuries, and several deaths every year in the United States. The financial cost of transportation delays caused by fog has not been calculated but is substantial.

Fog Vulnerability Assessment

- **Critical Facilities.** In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Fog a risk factor of 18 indicating this natural hazard is a moderate threat to the county. Critical facility's vulnerability to fog is negligible and would not interrupt services provided by these facilities. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- **Business and Industry.** In Vernon County there are 630 businesses and industries, see Table 3-6. Businesses and industries vulnerability to fog would be negligible.
- **Agriculture.** In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. Several species of plants, including some crops, depend on fog for moisture. Agriculture's vulnerability to fog is negligible except in extreme cases during prolonged periods of heavy rains, fog may be a contributing factor in some plant diseases.
- **Roads and Highways.** Fogs are most apt to occur in lower elevations blocked by wind flow. STH 35 along the Mississippi River is a good example of fog occurrence. Poor visibility is the major problem with fog, although in the early spring and late fall freezing of the roadway surface can accompany fog and present an additional hazard. Dense fog can be particularly challenging to drivers, pedestrians and bicyclists, even those not directly on the roadway. Dense fog in parking lots can present security and safety problems for people walking to their cars to and from buildings.
- **Railroads.** The location of railway lines along the Mississippi River requires train engineers to operate more frequently in fog. The same visibility problems confronting the motorist confront the railroad engineer, except the rail operator is more assured other trains will be clear of the right-of-way than a motorist can be assured other vehicles will be clear of the highway. The train engineer still must contend with pedestrians and animals being on the track and not seen in a heavy fog, as well as the possibility of an unseen vehicle at a road grade crossing.
- **Airway.** The Viroqua and Hillsboro airports are not equipped to handle aircraft in conditions other than Visual Flight Rules.
- **Waterways.** Commercial vessels on the Mississippi River are equipped with radar and Coast Guard licensed pilots that know how to use the equipment. Navigation in fog is possible, but the reduced visibility increases the danger. Pleasure craft operated by recreationists pose the biggest threat to safety during foggy periods. Fog makes deck work more dangerous for deck hands on commercial craft.
- **Municipal Water.** In the county there are 20 municipal wells and water systems in operation, see Table 3-11. These facilities vulnerability to fog is negligible and would not interrupt services provided by these facilities.
- **Wastewater Treatment Facilities.** There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities vulnerability to fog is negligible and would not interrupt services provided by these facilities.
- **Hazardous Material Sites.** Fog presents no specific hazard to stored hazardous material. Hazardous material being transported is subject to the same danger as the transportation mode being used.

Fog Risk Assessment Designation

Fog Historical Occurrence Rating: High - 7

Fog Vulnerability Rating: Negligible - 1

Fog Probability Rating: Highly Likely - 7

Fog Local Official Survey Rating: Medium - 3

Fog Risk Assessment Designation: **Moderate Threat – 18 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Fog Hazard Mitigation Ideas: ● Local and State governments can develop automated visibility warning systems that use weather sensors to detect reduced visibility conditions (heavy rains, fog white-out). These systems could trigger a permanent or portable Dynamic Message Sign (DMS) with a message indicating the adverse driving conditions. These same systems could also distribute information on the road hazard to traffic management centers, public safety agencies, or other traffic information systems. ● Educate citizens on weather and road condition resources such as radio, cable TV, Internet etc.

3.17 Vernon County, Landslide Risk Assessment

Landslide Definition: A landslide is a relatively sudden movement of soil and bedrock downhill in response to gravity. The movement of the soil can cause damage to structures by removing the support for the foundation of a building or by falling dirt and debris colliding with or covering a structure. Landslides can be triggered by heavy rain, bank or bluff erosion, or other natural causes.

Landslide History and Frequency: During the flooding that occurred 05/31/2000-6/2/2000 a mudslide buried a home under the Mississippi River bluffs in De Soto, Wisconsin. Mudslides also occurred due to heavy rains in 2007, 2008, 2013 and 2018.

In Wisconsin landslides generally are not dramatic; however there have been instances of rock fall along the bluffs of the Mississippi River and the collapsing of hillsides during heavy rainfall.

Landslide Vulnerability Assessment

- **Critical Facilities.** In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Landslide a risk factor of 9 indicating this natural hazard is a low risk to the county. Critical facility's vulnerability to landslides is negligible and would not interrupt services provided by these facilities except in extreme cases. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- **Business and Industry.** In Vernon County there are 630 business and industries that employ 7,123 people, see Table 3-6. For most businesses and industries vulnerability to landslides would be negligible except for buildings located next to steep slopes or bluffs.
- **Agriculture.** In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. Agriculture's vulnerability to landslides is negligible because this natural hazard is usually an isolated incident and damages would be confined to a limited area.
- **Roads and Highways.** Landslides would be most severe on roads in rock cuts, or cliffs and could leave roads impassable.
- **Railroads.** Landslides can cause obvious damage with railroad lines, especially on lines along the Mississippi River.
- **Airway.** Landslides could cause parked planes to smash into one another and hangers or other structures could be damaged. Obviously, landslides would have no direct effect on an airborne aircraft, but runway damage could occur, with mud or debris covering it.
- **Waterways.** A large landslide into a waterway could cause wave action, and possibly temporary current reversal on even a large river like the Mississippi. If the event should occur during the active commercial navigation season the problems caused could include, moored barges breaking free, tows running aground, and lock chamber doors becoming jammed and inoperative.
- **Municipal Water.** In the county there are 20 municipal wells and water systems in operation, see Table 3-11. These facilities vulnerability to landslides is negligible and would not interrupt services provided by the facilities except in extreme cases.
- **Wastewater Treatment Facilities.** There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. These facilities vulnerability to landslides is negligible and would not interrupt services provided except in extreme cases.
- **Hazardous Material Sites.** Industrial operations that require the piping or storage of hazardous material in the manufacturing process are most prone to landslide damage. Pipes could break if a landslide would hit the pipe or supporting structure. Material stored in tanks or other containers is also prone to being hit by a landslide and breaking, resulting in the release of the material.

Landslide Risk Assessment Designation

Landslide Historical Occurrence Rating: Low - 1

Landslide Vulnerability Rating: Negligible - 1

Landslide Probability Rating: Possible - 3

Landslide Local Official Survey Rating: Low - 4

Landslide Risk Assessment Designation: **Low Threat – 9 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Landslide Hazard Mitigation Ideas:

- Local governments, developers, and residents can make better decisions using maps
- Building codes can set construction standards, including minimum foundation requirements, in landslide-prone areas
- Zoning ordinances may be used to create buffers between structures and high-risk areas
- A special purpose ordinance for slide-prone areas may be used to limit fill or dumping
- Set drainage control regulations to reduce the risk of landslides resulting from saturated soils
- Grading ordinances require developers and landowners to obtain permits prior to filling or regrading
- Hillside development ordinances are special purpose ordinances that set specific standards for construction on hillsides
- Sanitary system codes can reduce the effect of drainage on landslides by limiting the type and location of sanitary systems
- Open space designations keep landslide prone areas undeveloped
- Structures may be moved to less hazardous locations
- Land and structures may be purchased by and titled in the name of a local government body than can remove structures and enforce permanent restrictions on development
- Restraining structures may be designed and used to hold soil in place
- Grading can be used to increase slope stability
- Various types of vegetation increase soil stability
- Placing utilities outside of landslide areas decreases risk of service disruption
- Restrictive covenants, a legal binding agreement, can be used in a private development to impose restrictions on land use

3.18 Vernon County, Subsidence Risk Assessment

Subsidence Definition: Sinkholes are geological phenomena that can pose a hazard to structures and people. A sinkhole is a depression in the ground caused by an evacuation of support from below the soil. Sinkholes can form naturally in areas with karst geology, areas that have limestone or other bedrock that can be dissolved by water. As the limestone rock under the soil dissolves over time from rainfall or flowing groundwater, a hollow area may form underground, into which surface soil can sink. Sinkholes can also be caused by human activity. Areas with karst conditions can be subject to groundwater contaminants from pollutants entering a sinkhole, fissure or other karst feature.

Sinkholes have not been a factor in any natural disaster. However, karst features should be identified and considered in a community especially for land use planning, stormwater management and hazardous materials planning to avoid possible damage to structures or contamination of groundwater. Even a well 100 feet deep can be contaminated for surface pollutants entering a sinkhole.

Subsidence History and Frequency: No information was found on major subsidence events in Vernon County.

Subsidence Vulnerability Assessment

- Critical Facilities. In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. The Hazard Risk Assignment assigns Subsidence a risk factor of 7 indicating this natural hazard is a low risk to the county. Buildings are susceptible to sink holes and can cause a wide range of damage to structures including damage to foundations, partial collapse and/or total destruction of buildings. Sinkholes have not been a factor in any natural disasters in the county. Critical facility's vulnerability to sinkholes in this area is negligible and would not interrupt services provided by these facilities except in extreme cases. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- Business and Industry. In Vernon County there are 630 businesses and industries that employed 7,123 people and had an annual payroll of \$242 million, see Table 3-6. Buildings are susceptible to sinkholes and can cause a wide range of damages to structures including damage to foundations, partial collapse, and/or total destruction of buildings. Businesses and industries' vulnerability to sinkholes is negligible in this area.

- Agriculture. In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. Agriculture vulnerability to sinkholes is negligible because this natural hazard is usually an isolated incident and damages would be confined to a limited area.
- Roads and Highways. Roads built on areas with karst topography could be subject to subsidence. Sinkholes, when they have occurred in other areas, often happen suddenly, and a vehicle on the highway could literally fall into a hole opening beneath it. The danger of the large subsidence area remains a threat to an unsuspecting motorist, especially at night, until proper barricades can be put up. The threat of subsidence is greater on the ridge top and side hill areas than in the valleys.
- Railroads. Subsidence along the railroad tracks could come from direct undermining of the banks by river action. Airway. The Viroqua and Hillsboro airports are not built in an area prone to subsidence.
- Waterways. Soil surface subsidence would have little impact on river navigation.
- Municipal Water. In the county there are 20 municipal wells and water systems in operation, see Table 3-11. Sinkholes can cause damage to structures and underground piping that carries the water supply. Wells can be contaminated from surface pollutants entering sinkholes. These facilities vulnerability to sinkholes in this area is negligible and would not interrupt services provided by the facilities except in extreme cases.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the county, see Table 3-12. Sinkholes can cause damage to structures and underground piping that carry wastewater. These facilities vulnerability to sinkholes is negligible and would not interrupt services provided except in extreme cases.
- Hazardous Material Sites. Unless a hazardous materials storage or disposal site were built in karst topography or on unstable wetland soils, an unlikely possibility, subsidence would not pose a major problem.

Subsidence Risk Assessment Designation

Subsidence Historical Occurrence Rating: Low -1

Subsidence Vulnerability Rating: Negligible - 1

Subsidence Probability Rating: Possible - 3

Subsidence Local Official Survey Rating: Low - 2

Subsidence Risk Assessment Designation: **Low Threat – 7 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Subsidence Hazard Mitigation Ideas: • Local governments and state governments can promote community awareness of subsidence risks and effects • Old mining areas or geologically unstable terrain should be identified and mapped so that development can be prevented and limited • Areas susceptible to collapse can be maintained as public open space • Local governments can acquire and title land and enforce permanent restrictions on development • Filling or buttressing subterranean open spaces, as with abandoned mines • Move structures to less hazardous locations • Monitor groundwater levels in subsidence-prone areas

3.19 Vernon County, Pandemic Flu Risk Assessment

Pandemic Flu Definition: A pandemic is a global disease outbreak. Flu pandemic occurs when a new influenza virus emerges for which people have little or no immunity, and for which there is no vaccine. The disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in very short time.

It is difficult to predict when the next influenza pandemic will occur or how severe it will be. Wherever and whenever a pandemic starts, everyone around the world is at risk. Countries might, through measures such as border closures and travel restrictions, delay arrival of the virus, but cannot stop it. Flu Pandemics are low frequency events, but they have the capability of being extreme impact disasters.

Pandemic Flu History and Frequency:

Flu Pandemics are naturally occurring events. Flu pandemics have occurred three times in the last century, in 1918, 1958, and 1967. The 1918 pandemic was the most severe disease outbreak in the history of the world. An estimated 20-40 million people died worldwide. It is not a matter of if another pandemic will occur but when will it occur and how lethal will it be.

Pandemic Flu Vulnerability Assessment

- Critical Facilities. In the county 82 service orientated critical facilities were identified. These include (16) government and military facilities; (20) hospitals, clinics, and residential facilities; (21) police and fire facilities; and (25) schools. These facilities will be severely affected during a pandemic flu. Hospitals and clinics will be inundated with the sick, Residential Care facilities will be closed to visitors and all the services will be severely affected by employees unable to come to work. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- Business and Industry. In Vernon County there are 630 businesses and industries that employed 7,123 people and had an annual payroll of \$242 million, see Table 3-6. Businesses and industries will be severely affected by employees unable to come to work due to illness, at-home caring for ill family members, or perhaps a fear of going to work due to the contagious nature of the disease.
- Agriculture. In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use. Agriculture will be affected by workers unable to tend to crops and animals due to being unable to come to work.
- Roads and Highways. Automobiles and buses carrying affected people are a means of spreading a pandemic flu quickly throughout the U.S. and the world. A way of slowing this spread will be to ask people not to travel. In addition, highway crews and maintenance personnel will be affected.
- Railroads. Trains carrying affected people are a means of spreading a pandemic flu quickly throughout the U.S. and the world. A way of slowing this spread will be to stop passenger train services. In addition, other train services would be affected due to the lack of operators who would be unable to work due to the flu.
- Airway. Airplanes carrying affected people are a means of spreading a pandemic flu quickly throughout the U.S. and the world. A way of slowing this spread will be to close down airports. A pandemic flu will have a severe impact on airways.
- Waterways. Pandemic Flu presents no specific hazard to waterways.
- Municipal Water. In the county there are 20 municipal wells and water systems in operation, see Table 3-11. These facilities' vulnerability to Pandemic Flu is through the people who would be maintaining and running these facilities. If the operators are affected, then the facility will be affected due to lack of operators.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the County, see Table 3-12. These facilities' vulnerability to Pandemic Flu is through the people who would be maintaining and running these facilities. If the operators are affected, then the facility will be affected due to lack of operators.
- Hazardous Material Sites. Pandemic Flu presents no specific hazard to stored hazardous material but could impact persons responsible for monitoring and maintaining these sites.

Pandemic Flu Risk Assessment Designation

Pandemic Flu Historical Occurrence Rating: Low -1

Pandemic Flu Vulnerability Rating: Negligible - 9

Pandemic Flu Probability Rating: Possible - 2

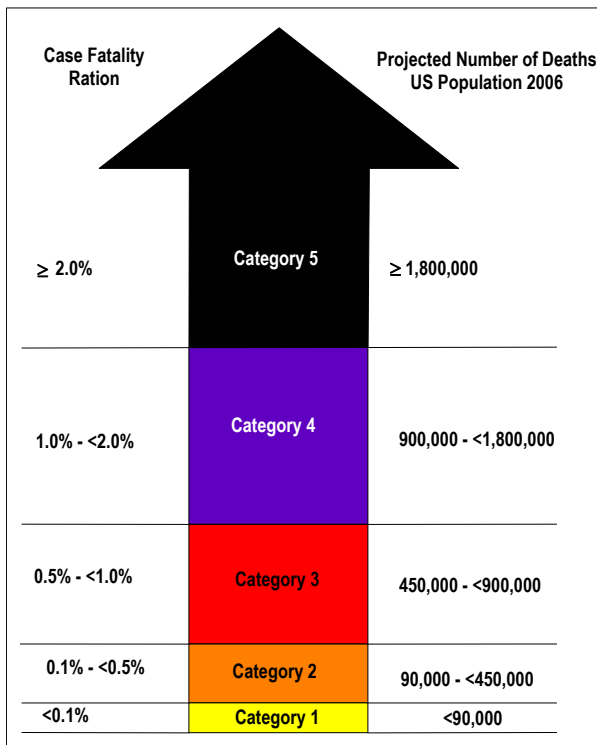
Pandemic Flu Local Official Survey Rating: Low - 2

Pandemic Flu Risk Assessment Designation: **Low Threat – 14 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Pandemic Flu Risk Assessment Designation

The following is a Pandemic Severity Index, this index uses case fatality ratio as the critical driver for categorizing the severity of a pandemic. The index is designed to enable estimation of the severity of a pandemic on a population level to allow better forecasting of the impact of a pandemic.



Source: Interim Pre-Pandemic Planning Guidance: Community Guidance for Pandemic Influenza Mitigation in the United States.

Pandemic Flu Hazard Mitigation Ideas: The pandemic mitigation framework that is proposed is based upon an early, targeted, layered application of multiple partially effective nonpharmaceutical measures. It is recommended that the measures be initiated early before explosive growth of the epidemic and, in the case of severe pandemics, that they be maintained consistently during an epidemic wave in a community. The pandemic mitigation interventions described in this document include:

1. Isolation and treatment (as appropriate) with influenza antiviral medications of all persons with confirmed or probable pandemic influenza. Isolation may occur in the home or healthcare setting, depending on the severity of an individual's illness and/or the current capacity of the healthcare infrastructure.
2. Voluntary home quarantine of members of households with confirmed or probable influenza case(s) and consideration of combining this intervention with the prophylactic use of antiviral medications, providing sufficient quantities of effective medications exist and that a feasible means of distributing them is in place.
3. Dismissal of students from school (including public and private schools as well as colleges and universities) and school-based activities and closure of childcare programs, coupled with protecting children and teenagers through social distancing in the community to achieve reductions of out-of-school social contacts and community mixing.
4. Use of social distancing measures to reduce contact between adults in the community and workplace, including, for example, cancellation of large public gatherings and alteration of workplace environments and schedules to decrease social density and preserve a healthy workplace to the greatest extent possible without disrupting essential services. Enable institution of workplace leave policies that align incentives and facilitate adherence with the nonpharmaceutical interventions outlined above.

All such community-based strategies should be used in combination with individual infection control measures, such as hand washing and cough etiquette.

Implementing these interventions in a timely and coordinated fashion will require advance planning. Communities must be prepared for the cascading second- and third-order consequences of the interventions, such as increased workplace absenteeism related to child-minding responsibilities if schools dismiss students and childcare programs close.

Decisions about what tools should be used during a pandemic should be based on the observed severity of the event, its impact on specific subpopulations, the expected benefit of the interventions, the feasibility of success in modern society, the direct and indirect costs, and the consequences on critical infrastructure, healthcare delivery, and society. The most controversial elements (e.g., prolonged dismissal of students from schools and closure of childcare programs) are not likely to be needed in less severe pandemics, but these steps may save lives during severe pandemics. Just as communities plan and prepare for mitigating the effect of severe natural disasters (e.g., hurricanes), they should plan and prepare for mitigating the effect of a severe pandemic.

3.20 Vernon, Railroad Risk Assessment

Railroad Definition: "Accident/Incident" include collisions, derailments, and other events involving the operation of on-track equipment causing damage including impacts between railroad on-track equipment and highway users at crossings.

In Vernon County there is only one rail line, the Burlington Northern-Santa Fe runs along the Mississippi River from the northern county line south to De Soto.

Train accidents are generally localized and most of the incidents result in limited impacts at the community level. However, if there are volatile or flammable substances on the train and the train is in a highly populated or densely forested area, death, injuries, and damage to homes, infrastructure, and the environment, including forest fires can occur.

It is difficult to predict when the next rail hazard will occur. Due to the large number of trains passing through Vernon County on a daily basis, it is not a matter of if a rail incident will occur but a matter of when. In addition, due to the rail lines passing through the incorporated communities of Stoddard, Genoa and De Soto the possibility of a derailment causing significant injury and damage is high. An added hazard is the growing number of hazardous cargo shipments these trains are carrying. Rail hazards are low frequency events, but they have the capability of being extreme impact disasters

Railroad History and Frequency:

1980's:	3 accidents reported by the Federal Railroad Administration: 1980 one derailment - \$164,000 total damage; 1986 one derailment - \$470,240 total damage; 1987 one derailment - \$8,000 damages.
1990's:	5 accidents reported by the Federal Railroad Administration: 1990 three derailments - \$344,100 total damages; 1994 one derailment - \$1,000 in damages; 1996 one derailment - \$6,500 in damages.
2000's:	No accidents reported by the Federal Railroad Administration.
2010's:	1 accident reported by the Federal Railroad Administration: 2011 one derailments - \$13,000 in damages.

Source: Federal Railroad Administration, Office of Safety Analysis

Railroad Vulnerability Assessment

- Critical Facilities. In the County, 82-service oriented critical facilities were identified. Of these include 12 are located within ½ mile of a rail line and could be directly or indirectly affected by a train derailment. These 12 facilities included: (3) government and military facilities; (1) hospitals, clinics, or residential facilities; (3) police and fire facilities; and (5) schools. These facilities could be severely affected from a train derailment. The structures could be destroyed or damaged from an explosion from a derailment, they could be forced to evacuate, or they could be cut off due to road closures. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- Business and Industry. In Crawford County the Burlington Northern-Santa Fe rail line runs through the Villages of Stoddard, Genoa and De Soto. Due to the location and layout of these incorporated communities most businesses and industries located within these communities would be severely affected by a train derailment. While most would not be structurally impacted or damaged by a derailment, road closures or evacuations due to a derailment would shut down these businesses and industries.

- Agriculture. In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use (See Table 2-5). A lot of agricultural products are transported by rail, but a train derailment would have little impact unless the derailment would cause a significant shut down time for the rail line.
- Roads and Highways. State Highway 35 runs parallel to the Burlington Northern-Santa Fe rail line, a derailment causing an evacuation could shut down this significant roadway in the county. In addition to potential evacuations train derailments could potentially close roads which cross over tracks if the derailment would occur at these points.
- Railroads. Train derailments have a huge impact on railroads as any derailment causes a shutdown of that line until the derailment can be cleared.
- Airway. Train derailments impact on air travel is negligible and would only be affected in the event of an evacuation being necessary due to the release of toxins which would cover the airport area.
- Waterways. The Burlington Northern-Santa Fe rail line runs along the Mississippi River. A train derailment along the line could potentially spill pollutants into the river. In addition, the rail line also runs adjacent to Lock & Dam 8 in Genoa. A derailment on these tracks alongside the lock could potentially damage or shut down the lock which would close the Mississippi River to all boat traffic both recreational and commercial.
- Municipal Water. In the County there are 20 municipal wells and water systems in operation, see Table 3-11. These facilities' vulnerability to rail derailment is minimal. These facilities could be affected through a spillage from a derailment seeping into the groundwater and contaminating the well or if a facility would have to be shut down due to a prolonged evacuation caused by a derailment.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the County, see Table 3-12. Two of these facilities are located in close proximity to rail lines, these facilities are located in the Villages of Stoddard and Genoa. A derailment adjacent to one of these facilities could damage or even destroy the facility. In addition, these facilities could also be affected in the event of a derailment causing a prolonged evacuation.
- Hazardous Material Sites. Hazardous materials located in close proximity to rail lines could be impacted by a train derailment. A derailment with explosive materials could damage or destroy buildings which house hazardous materials.

Railroad Risk Assessment Designation

Railroad Historical Occurrence Rating: Low -2

Railroad Vulnerability Rating: Negligible - 3

Railroad Probability Rating: Possible - 5

Railroad Local Official Survey Rating: Low - 2

Risk Assessment Designation: **Low Threat – 12 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

Rail Hazard Mitigation Ideas: • Local governments and state governments can promote community awareness of train derailment risks • First responders can obtain specific training provided by the railroad companies on how to respond to derailments • Municipalities can develop evacuation plans • Local governments can petition state and federal agencies for safer rail cars and equipment • Local municipalities can purchase and stage along the rail line specific response equipment • Move structures to less hazardous locations

3.21 Vernon County, River Traffic Risk Assessment

River Traffic Definition: The passage of people or commercial goods along a river.

The main channel of the Mississippi River forms the western border of Vernon County. The border starts at the Village of De Soto, river mile 667 and ends at river mile 691 at the Vernon/La Crosse county line, a total distance of 24 river miles. The Mississippi River has been controlled by a system of navigation locks and dams in order to maintain a 9-foot channel since 1930's. The dams were built to hold back water and form deeper navigation "pools." The pools are maintained at a constant minimum water depth of 9 feet for safe navigation. Dams allow river vessels to use a series of locks to "step" up or down the river from one water level to another. The U.S. Corps of Engineers operates the locks and dams on the Mississippi River for navigation, not flood control. The locks and dams create slack-water pools for navigation during periods of low- and moderate-

level water. In the 24 miles of the Mississippi River which flows through Vernon County there is one Lock and Dam. Lock and Dam 8 is located at mile marker 679.

Lock and Dam 8 Annual Tonnage

Year	Tons	Year	Tons	Year	Tons	Year	Tons
2016	14,554,997	2011	10,277,231	2006	11,712,327	2001	12,755,176
2015	10,671,661	2010	10,442,426	2005	11,090,000	2000	15,870,548
2014	9,754,119	2009	10,085,073	2004	12,569,495	1999	16,826,021
2013	8,660,029	2008	7,928,446	2003	13,160,824	1998	15,295,618
2012	10,118,566	2007	11,077,630	2002	15,331,794	1997	14,393,363

Lock and Dam 8 Commodities passing through in 2016

Commodity	Total tons
Coal, Lignite and Coke	62,500
Petroleum and Petroleum Products	191,900
Chemicals and Related Products	2,517,000
Crude Materials, Inedible, except Fuels	1,657,800
Primary Manufactured Goods	1,204,662
Food and Farm Products	8,910,720
Manufactured Equipment and Machinery	7,190
Unknown or not classified	3,225
Total Tons:	14,554,997

Source: US Army Corp of Engineers

"Accident/Incident" includes any event involving the operation of equipment on waters of the Mississippi River which causes damage or injury to any person.

River Traffic accidents are generally localized and most of the incidents result in limited impacts at the community level. However, if there are volatile or flammable substances on a barge and the barge is traveling through a populated area, death, injuries, and damage to homes, businesses, infrastructure can occur. In addition, environmental contamination can result from River Traffic accidents. Anhydrous Ammonia is the hazardous material that is carried the most on this portion of the river.

Commercial traffic along the Mississippi River is not required to notify the county when hazardous materials are being transported or how much is being transported. Without the knowledge of what is actually being transported or how often it is being transported along the river it is very difficult to make any predictions of how often an accident will occur or how much damage an accident would cause.

River Traffic History and Frequency:

No historic data is available

River Traffic Vulnerability Assessment

- **Critical Facilities.** In the County, 82-service oriented critical facilities were identified. Of these, 12 are located within 1 mile of the main channel of the Mississippi River and could be directly or indirectly affected by a river traffic incident. These 12 facilities included: (3) government and military facilities; (1) hospitals, clinics, or residential facilities; (3) police and fire facilities; and (5) schools. These facilities could be affected from a river traffic incident by either being destroyed or damaged from an explosion from an incident, they could be forced to evacuate, or they could be cut off due to road closures. See Tables 3-7 through 3-10 and Maps 3-1 through 3-4 for further information and location of these facilities.
- **Business and Industry.** In Vernon County Lock and Dam 8 is located in the Village of Genoa. Due to its location, businesses and industries located within the Village of Genoa would be severely affected by a river accident at the Lock and Dam.
- **Agriculture.** In 2017, county land use statistics indicated that 80.6% or 334,335 acres of county land were classified for agricultural use (See Table 2-5). Agriculture will be affected only by an accident or incident which would shut down the river for a long term which would affect the transportation of agricultural commodities.

- Roads and Highways. River Traffic would have an effect on Roads and Highways only if the accident would cause damage to a bridge which crosses the river or if an accident would cause a road closure due to the release of toxins.
- Railroads. The Burlington Northern Santa Fe rail line runs along the shore of the Mississippi River, river traffic, especially large barge traffic can undermine the banks along the river. This undermining of the tracks can and has in the past, cause derailments of trains.
- Airway. The only airports in Vernon County lie in areas that would not be affected by a River Traffic accident.
- Waterways. An accident on the Mississippi River would shut down the river to commercial traffic until the accident was cleaned up. This would not only affect the river traffic passing through Vernon County.
- Municipal Water. In the County there are 11 municipal wells and water systems in operation, see Table 3-11. These facilities' vulnerability to river traffic is minimal. These facilities could be affected through a spillage from a river traffic accident into the groundwater and contaminating the well.
- Wastewater Treatment Facilities. There are 11 wastewater treatment facilities in operation in the County, see Table 3-12. Four of these facilities are located along the Mississippi River, these facilities are located in the Villages of Stoddard and Genoa (De Soto's facility lies in Crawford County). A river traffic accident adjacent to one of these facilities could damage or even destroy the facility. In addition, these facilities could also be affected in the event of a river traffic accident occurring upstream of the facility which could contaminate the facility causing it to be shut down.
- Hazardous Material Sites. Hazardous materials located in close proximity to the Mississippi River could be impacted by a river traffic accident. An accident with explosive materials could damage or destroy buildings which house hazardous materials

River Traffic Risk Assessment Designation

River Traffic Historical Occurrence Rating: Low -2

River Traffic Vulnerability Rating: Negligible - 3

River Traffic Probability Rating: Possible - 5

River Traffic Local Official Survey Rating: Low - 2

River Traffic Risk Assessment Designation: **Low Threat – 12 points**

See Table 3-2 for a detailed analysis to determine the above Risk Assessment Designation.

River Traffic Mitigation Ideas: • Local governments and state governments can promote community awareness of river traffic risks • First responders can obtain specific training on how to respond to river traffic accidents • Municipalities can develop evacuation plans • Local governments can petition state and federal agencies for legislation requiring commercial haulers on the river to give notice when carrying hazardous materials • Local municipalities can purchase specific response equipment • Move structures to less hazardous locations

VERNON COUNTY LOCAL OFFICIAL HAZARD RISK ASSESSMENT SURVEY

In April of 2017 the Vernon County Emergency Management Coordinator and the Mississippi River Regional Planning Commission coordinated efforts in developing a Hazard Risk Assessment Survey for local officials to complete and return. This survey was mailed to all Village Presidents, Town Chairman, Mayors, Chiefs of Police, the Sheriff, and Fire Department Chiefs in the County. Each local official was asked in the survey to rank the County's hazards as high, medium, or low regarding their opinion on each hazard's threat to their community's health and public safety. The following are results of this survey.

Table 3-1
Risk Assessment Survey Results

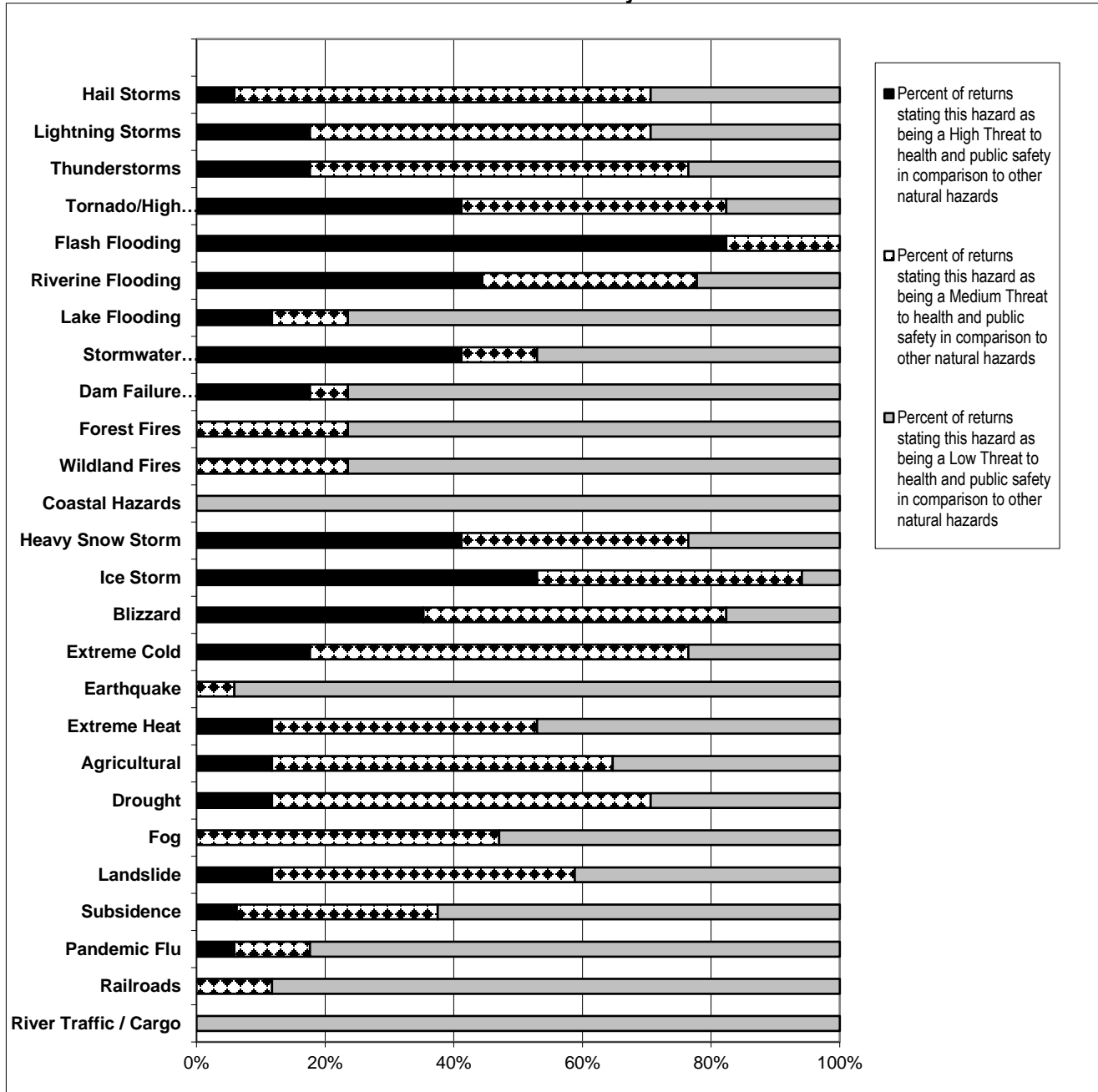


Table 3-2
Vernon County Hazard Risk Assessment

	Historical Occurrence Rating Criteria: <ul style="list-style-type: none"> Less than 4 occurrences in the past 25 years = Low rating, 1-3 points 4 to 7 occurrences in the past 25 years = Moderately Low rating, 3-5 points 8 to 12 occurrences in the past 25 years = Moderately High rating, 5-7 points More than 12 occurrences in the past 25 years = High rating, 7-9 points 	Vulnerability Rating Criteria: <ul style="list-style-type: none"> Less than 10% of population or property adversely affected = Negligible rating, 1-3 points 10% to less than 25% of population or property adversely affected = Limited rating, 3-5 points 25% to 50% of the population or property adversely affected = Critical rating, 5-7 points More than 50% of the population or property adversely affected = Catastrophic rating, 7-9 points 	Probability Rating Criteria: <ul style="list-style-type: none"> Less than 1% probability in the next 100 years = Unlikely rating, 1-3 points From 1% and 10% probability in the next year or at least one chance in next 100 years = Possible rating, 3-5 points Over 10% to nearly 100% probability in the next year or at least one chance in the next 10 years = Likely rating, 5-7 points Nearly 100% chance in the next year = Highly Likely rating, 7-9 points 	Local Official Hazard Survey Rating Criteria: <ul style="list-style-type: none"> A majority of local officials were of the opinion that this hazard posed a "low" threat to health and public safety = Low rating, 1-3 points A majority of local officials were of the opinion that this hazard posed a "medium" threat to health and public safety = Medium rating, 3-6 points A majority of local officials were of the opinion that this hazard posed a "high" threat to health and public safety = High rating, 6-9 points 		Risk Assessment Designation: <ul style="list-style-type: none"> A combined risk factor rating of 14 points or less = Low Threat A combined risk factor rating of 15 to 21 points = Moderate Threat A combined risk factor rating of 22 points or greater = High Threat
Natural Hazards:					Risk Factor Rating Total:	
Hailstorm	9	2	8	5	24	High Threat
Lightning Storm	9	2	7	6	24	High Threat
Thunderstorm	9	2	8	5	24	High Threat
Tornado/High Winds	7	5	6	8	26	High Threat
Riverine/Flash Flooding	8	3	6	8	25	High Threat
Dam Failure Flooding	1	2	3	3	9	Low Threat
Forest/Wildland Fires	1	1	3	3	8	Low Threat
Heavy Snowstorm	9	7	8	5	29	High Threat
Ice Storm	4	7	5	7	23	High Threat
Blizzard	2	7	3	5	17	Moderate Threat
Extreme Cold	4	7	5	4	20	Moderate Threat
Earthquake	1	7	3	1	12	Low Threat
Extreme Heat	6	7	5	4	22	High Threat
Agricultural	2	3	3	4	12	Low Threat
Drought	2	5	3	4	14	Low Threat
Fog	7	1	7	3	18	Moderate Threat
Landslide	1	1	3	4	9	Low Threat
Subsidence	1	1	3	2	7	Low Threat
Pandemic Flu	1	9	2	2	14	Moderate Threat
Railroads	2	3	5	2	12	Low Threat
River Traffic/Cargo	1	3	3	1	8	Low Threat

Table 3-3
Vernon County
Structures in the FEMA 100-Year Floodplain

Municipality	Number of Parcels	2018 Land Value	2018 Assessed Improvements Value	Total Assessed Value
T. Bergen	24	\$129,400	\$703,600	\$833,000
T. Christiana	2	\$97,400	\$104,900	\$202,300
T. Clinton	21	\$99,600	\$981,200	\$1,080,800
T. Coon	4	\$16,000	\$58,200	\$74,200
T. Forest	19	\$72,900	\$651,400	\$724,300
T. Franklin	1	\$20,000	\$121,200	\$141,200
T. Greenwood	1	\$17,400	\$48,900	\$66,300
T. Hamburg	1	\$59,300	\$67,900	\$127,200
T. Harmony	1	\$19,800	\$38,100	\$57,900
T. Jefferson	2	\$33,000	\$238,200	\$271,200
T. Kickapoo	4	\$42,700	\$162,600	\$205,300
T. Liberty	3	\$51,300	\$185,400	\$236,700
T. Stark	2	\$7,000	\$48,400	\$55,400
T. Sterling	4	\$58,900	\$201,600	\$260,500
T. Viroqua	2	\$63,100	\$245,100	\$308,200
T Webster	7	\$57,500	\$284,200	\$341,700
T. Wheatland	56	\$1,381,400	\$3,075,900	\$4,457,300
T. Whitestown	1	\$4,800	\$20,000	\$24,800
V. Chaseburg	3	\$32,200	\$218,000	\$250,200
V. Genoa	15	\$146,800	\$751,000	\$897,800
V. La Farge	40	\$163,300	\$1,430,500	\$1,593,800
V. Ontario	12	\$88,300	\$270,250	\$358,550
V. Readstown	14	\$78,500	\$401,300	\$479,800
V. Viola	18	\$43,200	\$680,500	\$723,700
C. Hillsboro	5	\$94,800	\$684,800	\$779,600
Vernon County Total	262	\$2,878,600	\$11,673,150	\$14,551,750

Table 3-4
Vernon County (100-Year) Flood Damage Potential
For Residences and Businesses

River Body and Location of Structures	Number of Structures at This Location	Structures Impacted During 100-Year Flood Event and First Floor Water Level Estimates¹	Total Damage to Structures During a 100 Year Flood Level Event
Mississippi River – North County Line South to V. Genoa	23 residences 1 commercial	12 residences with 1' of water 8 residences with minor damage 3 residences with no damage 1 commercial with minor damage	Avg. residence \$65,135 12 X \$65,135 X 0.22 = \$171,956 9 X \$1,000 = \$9,000 TOTAL \$180,956
V. Genoa	4 residences 3 commercials 7 detached garages 1 village park	4 residences with minor damage 1 commercial with 1' of water 2 commercials with minor damage 7 garages with minor damage 1 park with minor damage	14 X \$1,000 = \$14,000 \$122,800 X .22 = \$27,016 TOTAL \$41,016
Mississippi River – Battle Island	43 residences 2 municipals	12 residences with 1' of water 28 residences with minor damage 3 residences with no damage 2 municipals with minor damage	Avg. residence \$57,436 12 X \$57,436 X 0.22 = \$151,631 30 X \$1,000 = \$30,000 TOTAL \$181,631
TOTAL MISSISSIPPI RIVER			\$403,603
V. Chaseburg	1 residential 1 commercial 1 garage	1 resident with 1' water in first floor 1 commercial with 1' water in first floor 1 garage minor with minor damage	Total improvements \$218,000 \$218,000 X 0.22 = \$47,960 1 X \$1,000 - \$1,000 TOTAL \$48,960
Coon Creek	4 residences 1 commercial 2 agriculture	2 residences with 1' of water 2 residences with minor damage 1 commercial with minor damage 2 agriculture with minor damage	Avg. residence \$94,775 2 X \$94,775 X 0.22 = \$41,701 5 X \$1,000 = \$5,000 TOTAL \$46,701
TOTAL COON CREEK			\$95,661
Bad Axe River	5 residences 1 commercial	All with minor damage	6 X \$1,000 = \$6,000 TOTAL \$6,000
TOTAL BAD AXE RIVER			\$6,000
V. Readstown	13 residences 1 commercial	8 residences with 1' of water 1 commercial with 1' of water 5 residences with minor damage	Avg. residence \$30,262 8 X \$30,262 X 0.22 = \$53,261 \$7,900 X 0.22 = \$1,738 5 X \$1,000 = \$5,000 TOTAL \$59,999
West Branch Kickapoo River	27 residences 1 commercial 1 municipal/exempt 4 agriculture	12 residential with 1' water 1 commercial with 1' water 15 residences with minor damage 1 municipal with minor damage 4 agriculture with minor damage	Avg. residence \$61,319 Total commercial \$48,000 12 X \$61,319 X 0.22 = \$161,882 \$48,000 X .22 = \$10,560 20 X \$1,000 = \$20,000 TOTAL \$192,442
V. Viola	15 residences 3 commercials	10 residences with 1' of water 5 residences with minor damage 3 commercials with 1' of water	Avg. residence \$42,260 Total commercial \$46,600 10 X \$42,260 X 0.22 = \$92,972 \$46,600 X .22 = \$10,252 5 X \$1,000 = \$5,000 TOTAL \$108,224

Table 3-4
Vernon County (100-Year) Flood Damage Potential
For Residences and Businesses

River Body and Location of Structures	Number of Structures at This Location	Structures Impacted During 100-Year Flood Event and First Floor Water Level Estimates ¹	Total Damage to Structures During a 100 Year Flood Level Event
V. La Farge	20 residences 15 commercials 5 municipal/exempt	13 residences with 1' of water 7 residences with minor damage 8 commercials with 1' of water 7 commercials with minor damage 5 municipals with minor damage	Avg. residence \$35,255 Avg. commercial \$58,100 13 X \$35,255 X 0.22 = \$100,829 7 X \$1,000 = \$7,000 8 X \$58,100 X 0.22 = \$102,256 7 X \$1,000 = \$7,000 5 X \$1,000 = \$5,000 TOTAL \$222,085
Kickapoo River – South County Line north to La Farge	4 residences 2 agriculture	3 residences with 1' of water 1 residence with minor damage 2 agriculture with minor damage	Ave. residence \$43,925 3 X \$43,925 X 0.22 = \$28,990 3 X \$1,000 = \$3,000 TOTAL \$31,990
Warner Creek/Cheyenne Valley Creek and Bear Creek	20 residences 1 agriculture	12 residences with 1' of water 8 residences with minor damage 1 agriculture with minor damage	Avg. residence \$33,570 12 X \$33,570 X 0.22 = \$88,625 8 X \$1,000 = \$8,000 TOTAL \$96,625
V. Ontario	1 residential 10 commercials 1 municipal/exempt	1 residential with 1' of water 8 commercials with 1' of water 2 commercials with minor damage 1 municipal with minor damage	Total residential \$35,150 Avg. commercial \$18,120 \$35,150 X 0.22 = \$7,733 8 X \$18,120 X 0.22 = \$31,891 2 X \$1,000 = \$2,000 TOTAL \$41,624
TOTAL KICKAPOO RIVER			\$752,989
C. Hillsboro	5 commercials	2 commercials with 2' of water 2 commercials with 1' of water 1 commercial with minor damage	Avg. commercial \$136,960 2 X \$136,960 X .30 = \$82,176 2 X \$136,960 X .22 = \$60,262 1 X \$1,000 = \$1,000 TOTAL \$143,438
TOTAL FOR C. HILLSBORO			\$143,438
Cooley Creek	10 residences 1 agriculture	6 residences with 1' of water 4 residences with minor damage 1 agriculture with minor damage	Ave. residential \$53,270 6 X \$53,270 X 0.22 = \$70,316 5 X \$1,000 = \$5,000 TOTAL \$75,316
TOTAL FOR COOLEY CREEK			\$75,316
VERNON COUNTY TOTAL			\$1,477,007

Table 3-5
Vernon County Transportation Assessment

Municipality	Fed/State Numbered Highways Arterial Miles ⁽²⁾	Fed/State Numbered Highways Collector Miles ⁽²⁾	County Hwy Miles ⁽²⁾	Town Roads ⁽²⁾	Village/ City Streets ⁽²⁾	Total Hwy Miles	Burlington Northern Sante Fe Rail Miles	Total Rail Miles
T. Bergen	8.44	3.45	10.05	44.95		66.89	3.8	3.8
T. Christiana	7.53		10.35	56.32		74.20		0.0
T. Clinton			16.92	55.75		72.67		0.0
T. Coon	5.99	1.47	11.98	56.41		75.85		0.0
T. Forest	6.57	0.68	22.82	41.07		71.14		0.0
T. Franklin	14.02		17.41	65.55		96.98		0.0
T. Genoa	5.67	4.82	3.69	57.89		72.07	7.6	7.6
T. Greenwood	6.04		19.43	37.75		63.22		0.0
T. Hamburg	3.44	7.47	9.56	41.39		61.86		0.0
T. Harmony		6.92	16.96	52.15		76.03		0.0
T. Hillsboro	6.50	2.45	17.88	42.00		68.83		0.0
T. Jefferson		6.45	20.50	71.01		97.96		0.0
T. Kickapoo	14.90		11.58	50.25		76.73		0.0
T. Liberty	6.51		10.72	18.89		36.12		0.0
T. Stark	6.39	5.38	8.64	38.52		58.93		0.0
T. Sterling	7.51		14.97	61.72		84.20		0.0
T. Union		8.10	11.35	39.42		58.87		0.0
T. Viroqua	10.88	2.10	18.36	75.40		106.74		0.0
T. Webster		7.54	15.24	49.42		72.20		0.0
T. Wheatland	9.42		4.98	40.21		54.61	5.0	5.0
T. Whitestown	7.89	2.62	8.21	48.79		67.51		0.0
V. Chaseburg		1.17	0.54		1.67	3.38		0.0
V. Coon Valley	1.13	0.41	0.39		4.98	6.91		0.0
V. De Soto	2.31				3.11	5.42	0.2	0.2
V. Genoa	1.48	0.54			2.52	4.54	1.4	1.4
V. La Farge	1.13	1.13			7.89	10.15		0.0
V. Ontario	2.08	0.72	0.43		4.23	7.46		0.0
V. Readstown	3.00				6.31	9.31		0.0
V. Stoddard	0.93	0.50			4.80	6.23	2.2	2.2
V. Viola	1.47				3.18	4.65		0.0
C. Hillsboro	2.23		1.88		10.13	14.24		0.0
C. Viroqua	3.56	0.87	0.42		29.30	34.15		0.0
C. Westby	2.76				15.14	17.90		0.0
County Total	149.78	64.79	285.26	1044.86	93.26	1637.9	20.2	20.2

(1) Includes vehicles registered in "unknown districts"

(2) There are five jurisdictional classifications: Interstate Highways (Example I94), State System Highways (Example USH 14-STH 171), County Highways (Example CTH B), Town Roads (Example Mound Ridge Rd), and Village/City Streets (Example Main Street). Within incorporated areas (villages/cities), highways marked as state system or county roads will be classed by mileage by that system - even though they may also carry a local street name. The State system highways are either identified by functional classification-Principal/Minor Arterial (example USHs 14/61, STH 35, STH 27) or as Major/Minor collectors (example STH 179). Some local roads that are not identified as state systems roads may be a "federal aid" road.

Table 3-6
Vernon County Business Vulnerability Assessment
Number of Establishments/Employment/Payroll

NAICS Code and Description		No. of Employees ⁽¹⁾	Annual Payroll (\$1,000) ⁽²⁾	No. of Establishments
Vernon County Totals		7,123	242,185	630
11	Forestry, Fishing, Hunting & Agriculture Support	32	1,020	4
21	Mining	A	D	1
22	Utilities	C	D	4
23	Construction	199	9,607	67
31-33	Manufacturing	951	36,527	39
42	Wholesale Trade	577	31,486	27
44-45	Retail Trade	1,218	31,498	104
48-49	Transportation & Warehousing	472	10,745	31
51	Information	180	6,645	19
52	Finance and Insurance	293	12,110	36
53	Real Estate Rental & Leasing	28	927	17
54	Professional, Scientific & Technical Services	152	6,038	33
56	Admin, Support, Waste Mgt, Remediation Services	103	3,716	17
61	Educational Services	88	1,060	8
62	Health Care & Social Assistance	1,774	68,985	78
71	Arts, Entertainment & Recreation	23	567	10
72	Accommodation and Food Services	676	7,029	59
81	Other Services	240	4,200	75
99	Unclassified Establishments	a	D	1

Source: U.S. Department of Commerce-Economic and Statistics Administration-U.S. Census Bureau-County Business Patterns 2016

(1) Total includes number of employees in all industry classifications

(2) Total includes annual payroll in all industry classifications

Note: County Business Patterns (CBP) covers most NAICS industries excluding crop and animal production; rail transportation; National Postal Service; pension, health, welfare, and vacation funds; trusts, estates, and agency accounts; private households; and public administration. CBP also excludes most establishments reporting government employees.

A: 0-19 employees

B: 20-99 employees

C: 100-249 employees

E: 250-499 employees

F: 500-999 employees

G: 1,000-2,499 employees

H: 2,500 - 4,999 employees

I: 5,000 - 9,999 employees

J: 10,000 - 24,999 employees

K: 25,000 - 49,999 employees

L: 50,000 - 99,999 employees

M: 100,000 or more employees

S: Withheld because estimate did not meet publication standards

D: Withheld to avoid disclosing data for individual company's data are included in higher level totals

Table3-7
Vernon County Critical Facilities: Government and Military Facilities

Facilities	Community	Address	Telephone
Chaseburg Village Hall	Chaseburg	400 Depot Street	(608) 483-2660
Coon Valley Village Hall	Coon Valley	205 Anderson	(608) 452-3168
DeSoto Village Hall	DeSoto	57 Sandvick Street	(608) 648-2700
Genoa Village Hall	Genoa	111 Main Street	(608) 689-2265
Hillsboro City Hall	Hillsboro	836 Prairie Avenue	(608) 489-2521
La Farge Village Hall	La Farge	105 W Main Street	(608) 625-4422
Ontario Village Hall	Ontario	205 State Street	(608) 337-4381
Readstown Village Hall	Readstown	116 4th Street	(608) 629-5627
Stoddard Village Hall	Stoddard	180 N. Main Street	(608) 457-2136
Viola Village Hall	Viola	PO Box 38	(608) 627-1831
Vernon County-Land & Water Conservation Bldg.	Viroqua	220 Airport Road	(608) 637-5480
Courthouse Annex	Viroqua	400 Courthouse Square, Room 108	(608) 637-5380
Vernon County-Erlandson Office Building	Viroqua	E7410 Cty Hwy BB	(608) 637-5267
Viroqua City Hall	Viroqua	202 North Main Street	(608) 637-7154
National Guard Armory-Viroqua	Viroqua	600 Dyson Street	(608) 637-7539
Westby City Hall	Westby	200 North Main Street	(608) 634-3214

See Map 3.1 for the location of these government and military facilities.

Table 3-8
Vernon County Critical Facilities: Hospitals, Clinics, and Residential Care Facilities

Facilities	Community	Address	Telephone
Hospitals			
Vernon Memorial Hospital	Viroqua	507 South Main Street	(608) 637-2101
Gunderson St. Joseph's Hospital	Hillsboro	400 Water Avenue	(608) 489-8000
Clinics			
Gundersen Lutheran Hillsboro Clinic	Hillsboro	300 Water Avenue	(608) 489-2253
LaFarge Medical Clinic	La Farge	206 West Mill Street	(608) 625-2092
Hirsch Clinic	Viroqua	407 S. Main Street	(608) 638-6003
Bland Clinic Vernon Memorial Hospital	Westby	100 Melby Street	(608) 634-3316
Residential Care			
Bothne House	Coon Valley	100 Bothne Drive	(608) 452-2010
Milestone Senior Living	Hillsboro	504 Salsbery Circle	(608) 489-3932
Bethel Parkside Elderly Group Home	La Farge	315 West Adams Court	(608) 625-2308
Sherry House	Readstown	440 East Center Street	(608) 629-5150
Pleasant Valley Seniors	Stoddard	W466 Cth Rd K	(608) 787-6384
Viola House	Viola	509 S. Wagoner Street	(608) 627-1111
Creamery Creek	Viroqua	1049 Chicago Avenue	(608) 638-1600
Fair Haven	Viroqua	601 Arena Drive	(608) 637-8115
Bethel Home and Services, Inc.	Viroqua	614 South Rock Avenue	(608) 637-2171
Maplewood Terrace	Viroqua	620 Garfield Street	(608) 637-6344
Vernon Area Rehab Center	Viroqua	811 Rogers Street	(608) 637-2353
Vernon Manor	Viroqua	E7404A County BB	(608) 637-5400
Old Times	Westby	206 Polly Rude Way	(608) 634-2737
Norseland Nursing Home	Westby	323 Black River Road	(608) 634-3747

See Map 3.2 for the location of these hospitals, clinics and residential care facilities.

Table 3-9

Vernon County Critical Facilities: Police and Fire Facilities

Facilities	Community	Address	Telephone
Fire Departments			
Coon Valley Volunteer Fire Department	Coon Valley	205 Anderson Street	(608) 452-3300
De Soto Volunteer Fire Department	De Soto	57 Crawford Street	(608) 648-3331
Genoa Volunteer Fire Department	Genoa	406 Main Street	(608) 689-2561
Hillsboro Volunteer Fire Department	Hillsboro	1501 Water Avenue	(608) 489-2908
La Farge Fire Department	La Farge	201 South Cherry Street	(608) 625-2222
Ontario Fire Department	Ontario	205 State Street	(608) 337-4415
Readstown Volunteer Fire Department	Readstown	105 N. Railroad Street	(608) 629-5555
Stoddard-Bergen Volunteer Fire Department	Stoddard	188 N Main Street	(608) 457-2000
Viola Fire Department	Viola	204 N Main Street	(608) 627-1631
Viroqua Fire Department	Viroqua	702 E Broadway	(608) 637-3118
Westby-Christiana Fire Protection District	Westby	511 Ramsland Street	(608) 634-4810
Wheatland Township Volunteer Fire Department	De Soto	E2177 State Hwy 82	(608) 648-2600
Police Departments			
Coon Valley Police Department	Coon Valley	205 Anderson Street	(608) 452-3888
Hillsboro Police Department	Hillsboro	836 Prairie Avenue	(608) 489-2800
La Farge Police Department	La Farge	201 South Cherry Street	(608) 625-4500
Ontario Police Department	Ontario	313 Main Street	(608) 337-4800
Readstown Police Department	Readstown	Highway 131 North	(608) 629-5772
Viola Police Department	Viola	106 W. Wisconsin Street	(608) 627-1831
Viroqua Police Department	Viroqua	702 East Broadway Street	(608) 637-2121
Westby Police Station	Westby	220 North Main Street	(608) 634-4411
Vernon County Sheriff's Office	Viroqua	400 Courthouse Square	(608) 637-2124

See Map 3.3 for the location of these police and fire departments.

Table 3-10
Vernon County Critical Facilities: School Facilities

Facilities	Community	Address	Telephone
Public Schools			
Coon Valley Elementary	Coon Valley	300 Lien Street	(608) 452-3143
De Soto Middle School	De Soto	Highway 82	(608) 648-0105
De Soto High School	De Soto	Highway 82	(608) 648-0105
Hillsboro Elementary School	Hillsboro	853 Hillsborough Avenue	(608) 489-2225
Hillsboro High School	Hillsboro	School Avenue	(608) 489-2221
Kickapoo Elementary	Viola	S6520 State Hwy 131	(608) 627-0100
Kickapoo High School	Viola	S6520 State Hwy 131	(608) 627-0100
La Farge Elementary School	La Farge	301 W Adams Street	(608) 625-2400
La Farge High School	La Farge	301 W Adams Street	(608) 625-2400
La Farge Middle School	La Farge	301 W Adams Street	(608) 625-2400
Laurel High School	Viroqua	100 Blackhawk Drive	(608) 637-8486
Prairie View Elementary School	De Soto	E3245 Co Rd N	(608) 648-2227
Stoddard Elementary	Stoddard	300 N Cottage Street	(608) 457-2101
Viroqua High School	Viroqua	100 Blackhawk Drive	(608) 637-1210
Viroqua Middle School	Viroqua	100 Blackhawk Avenue	(608) 637-1100
Viroqua Elementary School	Viroqua	701 Education Avenue	(608) 637-1100
Westby Elementary School	Westby	122 Nelson Street	(608) 634-7204
Westby High School	Westby	206 West Avenue South	(608) 634-3101
Westby Middle School	Westby	206 West Avenue South	(608) 634-3003
Private Schools			
Coon Valley Christian School	Westby	E5151 Nesselte Rd	(608) 799-2126
Cornerstone Christian Academy	Westby	PO Box 86	(608) 634-4102
Pleasant Ridge Waldorf School	Viroqua	431 E Court Street	(608) 637-7828
St. Charles Elementary School	Genoa	PO Box 130	(608) 689-2642
St. Matthews Lutheran School	Stoddard	303 N Main St, Box 208	(608) 457-2700
Youth Initiative High School	Viroqua	500 E Jefferson Street	(608) 637-6445

See Map 3.4 for the location of these schools.

Table 3-11
Vernon County Critical Facilities: Wells

Community	Construction Date	Well Bottom (ft.)	Static Water Level (ft.)	Well Status
Chaseburg		880		ACTIVE
Coon Valley	4/28/1975	278	0	ACTIVE
Coon Valley	8/2/1990	275	14	ACTIVE
De Soto (Vernon)	1/1/1968	230	93	ACTIVE
Genoa	10/1/1977	126.7	26.3	ACTIVE
Hillsboro	1/1/1972	222	43	ACTIVE
Hillsboro	10/10/2013	354	58.5	ACTIVE
La Farge	8/21/1996	271	77	ACTIVE
La Farge	1/1/1964	417	12	ACTIVE
La Farge	11/22/1995	460	74	ACTIVE
Ontario	9/1/2016	235	72.2	ACTIVE
Ontario	1/1/1948	186	32.5	ACTIVE
Readstown	10/24/1984	320	21	ACTIVE
Stoddard	8/17/1995	152	36	ACTIVE
Stoddard	1/1/1940	152	38	ACTIVE
Viola (Vernon)	1/1/1951	327	60	ACTIVE
Viroqua	8/2/2007		450	ACTIVE
Viroqua	12/1/2003	1100	450	ACTIVE
Viroqua	7/24/2013	1155	490	ACTIVE
Viroqua	6/6/2005	1100	450	ACTIVE
Viroqua	1/11/1994	880	475	ACTIVE
Westby	5/1/1959	1100	411	ACTIVE
Westby	1/1/1977	1100	453	ACTIVE

Source: Wisconsin Department of Natural Resources

Table 3-12

Vernon County Critical Facilities: Wastewater Treatment Plants

Wastewater Treatment Plant	Community
Chaseburg Sewage Treatment Plant	V. Chaseburg
Coon Valley Wastewater Treatment Plant	V. Coon Valley
Genoa Water and Sewer Department	V. Genoa
Hillsboro Municipal Waste Treatment Plant	C. Hillsboro
La Farge Sewage Treatment Plant	V. La Farge
Ontario Sewage Treatment Plant	V. Ontario
Readstown Sewage Treatment Plant	V. Readstown
Stoddard (Village of) Sewage Treatment Plant	V. Stoddard
Viola Sewage Treatment Plant	V. Viola
Viroqua Sewage Treatment Plant	C. Viroqua
Westby Sewage Treatment Plant	C. Westby

Source: Wisconsin Department of Natural Resources

Table 3-13

Vernon County Critical Facilities: Hazardous Material Sites

Facility/Site Name	Address	Municipality
AT & T	2.6 miles northeast of Mt. Tabor	Mt. Tabor
AT & T Micro Tower (Coon Valley)	E5955 US Hwys 14/61	Coon Valley
Chaseburg Farmers Union Services	Hwy 162	Chaseburg
Chaseburg Farmers Union Services	113 Cactus Dr	Chaseburg
Hillsboro Street Department	1010 Crest Ave	Hillsboro
C. Viroqua Airport	1320 Ellis West Rd	Viroqua
Viroqua Sand/Salt Storage	602 North Rock St	Viroqua
City of Westby	200 North Main Street	Westby
Town of Coon	S1770 Town Hall Lane	Westby
Corps of Engineers Lock & Dam 8	S4405 State Hwy 35	Genoa
Croell Inc.	S4498 US Hwys 14/61	Viroqua
CROPP Cooperative-Chaseburg Creamery	203 South Main St	Chaseburg
CROPP Cooperative-Hillsboro Consolidation Point	E16304 Cth V	Hillsboro
Dairyland Power Station #3	S4651 State Hwy 35	Genoa
Ferrell Gas L.P.	E7584 Cth SS	Viroqua
Frontier Communications	114 E Court St	Viroqua
Genoa National Fish Hatchery	S5631 STH 35	Genoa
Hillsboro Equipment, Inc.	E18898 Hwys 33, 80 & 82	Hillsboro
Kickapoo Area School District	S6520 Sth 131	Kickapoo
Land O Lakes	186 East Madison St.	Hillsboro
Mageland Oil & Fuels LLC	105 Railroad Ave	Viroqua
Midwest Fuels-Westby Bulk Plant	215 Swiggum Rd	Westby
Midwest Industrial Fuels	713 East Broadway St	Viroqua
Nelson Global Products	1202 Nelson Parkway	Viroqua
Premier Cooperative	405 South Main St.	Westby
Premier Cooperative	107 Railroad Ave	Viroqua
Premier Cooperative	201 Swiggum St	Westby
Select Sires Inc.	E6975 Unseth Road	Westby
Sheldon's Asphalt Paving	E8004 Sth 56	Viroqua
Bergen Town Hall	N2094 Proksch Coulee Rd	Stoddard
Christiana Town Shop	505 North Saugstad Rd	Westby
Clinton Town Shop	S945 County Rd D	Cashton
Franklin Town Shop	S6635 Hwy 27	Viroqua
Town of Genoa garage	S5165 South Creek Rd	Genoa
Greenwood Town Shop	S4105 County C	Hillsboro
Hamburg Town Shop	S1631A County Rd K	Chaseburg
Harmony Town Shop	E2905 Newton Valley Rd	Genoa
Hillsboro Town Shop	Town Shop Rd	Hillsboro
Jefferson Town Shop	S4020 Co Rd B	Viroqua
Kickapoo Town Shop	West Prairie St.	Readstown
Liberty Town Shop	E10510 Gore Hollow Rd	Viola
Stark Town Shop	S3803 Corps Rd	La Farge
Sterling Town Shop	E4621 State Hwy 82	Viroqua
Viroqua Town Shop	E7506A Co Rd BB & Railroad Ave	Viroqua

Table 3-13

Vernon County Critical Facilities: Hazardous Material Sites

Facility/Site Name	Address	Municipality
Webster Town Shop	E10614 State Hwy 82	La Farge
Wheatland Town Shop	E2176 State Hwy 82	De Soto
Whitestown Town Shop	S1701 Sandhill Rd	La Farge
Tractor Central, LLC	S3050 US Hwy 14/61	Westby
United Cooperative	198A East Madison St	Hillsboro
United Cooperative	140 Short St	Hillsboro
United Cooperative-Active Bulk Petro and Grain	S1729 County Rd HH	Hillsboro
Vernon Co Hwy Dept	Railroad Ave	Viroqua
Vernon Co Hwy Dept	602 North Main Street	Viroqua
Vernon Co Hwy Dept	E428 Gianoli Rd	Genoa
Vernon Co Hwy Dept-Dutch Hollow Shop	E12938 Dutch Hollow Rd	La Farge
Vernon Co Hwy Dept-Hillsboro Shop	1020 Crest Ave	Hillsboro
Vernon Co Hwy Dept-Coon Valley Shop	S955 STH 162	Coon Valley
Vesbach Oil & Propane Inc.	E7381 Swenson Rd	Viroqua
Village of Coon Valley	205 Anderson Street	Coon Valley
Village of Readstown	116 N 4th Street	Readstown
Viroqua Area Schools	115 Education Ave	Viroqua
Viroqua Armory	600 Dyson St	Viroqua
Walmart	1133 North Main St	Viroqua
Westby Area Schools	206 West Ave	Westby
Whitehall Specialties	1401 County Hwy HH	Hillsboro

See Map 3.3 for the location of these hazardous material sites.

Table 3-14

Vernon County Critical Facilities: Dams

Map Code	County Name	Abandon Year	Dam Official Name	Dam Size Type	Down City Miles Amount	Down City Name	(1) ESTD Haz Rating Code
1	Vernon		LA FARGE	LARGE	0	LA FARGE	L
2	Vernon		HILLSBORO	LARGE	0	HILLSBORO	S
3	Vernon		KLINKNER	LARGE	0	NONE	S
4	Vernon		MLSNA	LARGE	0	NONE	S
5	Vernon		COON CREEK 14	LARGE	0	NONE	L
6	Vernon		COON CREEK 15	LARGE	0	NONE	L
7	Vernon		COON CREEK 16	LARGE	0	NONE	L
8	Vernon		COON CREEK 17	LARGE	0	NONE	L
9	Vernon		BAD AXE 2	LARGE	2	SPRINGVILLE	S
10	Vernon		BAD AXE 24	LARGE	0	NONE	S
11	Vernon		BAD AXE 17	LARGE	0	NONE	L
12	Vernon		BAD AXE 16	LARGE	0	NONE	L
13	Vernon		BAD AXE 34	LARGE	0	NONE	L

Table 3-14
Vernon County Critical Facilities: Dams

Map Code	County Name	Abandon Year	Dam Official Name	Dam Size Type	Down City Miles Amount	Down City Name	(1) ESTD Haz Rating Code
14	Vernon		BAD AXE 33	LARGE	7	NONE	L
15	Vernon		WEST FORK KICKAPOO 3	LARGE	0	NONE	S
16	Vernon		WEST FORK KICKAPOO 12	LARGE	0	NONE	S
17	Vernon		WEST FORK KICKAPOO 4	LARGE	0	NONE	H
18	Vernon		WEST FORK KICKAPOO 1	LARGE	4	BLOOMINGDALE	S
19	Vernon		WEST FORK KICKAPOO 17	LARGE	0	NONE	H
20	Vernon		WEST FORK KICKAPOO 5	LARGE	0	NONE	L
21	Vernon		WEST FORK KICKAPOO 16	LARGE	0	NONE	L
22	Vernon		HERBECK	LARGE	0	NONE	L
23	Vernon		LOCK AND DAM 8	LARGE	6	VICTORY	S
24	Vernon		GENOA FISH HATCHERY POND 3	LARGE	0	NONE	L
25	Vernon		GENOA FISH HATCHERY POND ONE	LARGE	0	NONE	L
26	Vernon		BAD AXE 12	LARGE	4	NEWTON	H
27	Vernon		VON RUDEN	LARGE	0	NONE	L
28	Vernon		ROBERTS, CHARLES	LARGE	0	NONE	S
29	Vernon		LAWSON	LARGE	0	NONE	L
30	Vernon		COON CREEK 41	LARGE		CTH P	S
31	Vernon	1992	GILES WHITE	LARGE	0	ONTARIO	L
32	Vernon		THOMPSON, ROLAND	SMALL	4	UNION CENTER	L
33	Vernon	1985	FOWELL	SMALL	0	READSTOWN	L
34	Vernon		OIUM	SMALL	7	COON VALLEY	L
35	Vernon		BEAN, JOHN	SMALL			
36	Vernon		CANO, JOSEPH R.	SMALL			
37	Vernon		CASS, LYLE	SMALL			
38	Vernon		ERICKSON, PAUL D.	SMALL			
39	Vernon		FRANKEL, BERTRAM	SMALL			
40	Vernon		FRONK, BERNARD	SMALL			
41	Vernon		HALE, AL NO.1	SMALL			
42	Vernon		HALE, AL NO.2	SMALL			
43	Vernon		HUNDT, JOHN	SMALL			
44	Vernon		JAEGER, JOHN G.	SMALL			
45	Vernon		KALB, WALTER	SMALL			
46	Vernon		KEEGAN, ROBERT L.	SMALL			
47	Vernon		MANKE, CLARICE	SMALL			
48	Vernon		MUNSON, PALMER	SMALL			
49	Vernon		NICKELOTTI, PHILLIP	SMALL			
50	Vernon		O'REILLY, ROGER	SMALL			
51	Vernon		PETNIUNAS, STANLEY	SMALL			
52	Vernon		SHARRATT, THOMAS B.	SMALL			
53	Vernon		STANEK, PAUL F.	SMALL			
54	Vernon		STARR, ROBERT A 3	SMALL			
55	Vernon		STRASSER, RUDOLPH	SMALL			
56	Vernon		THOMPSON G.E.	SMALL			

Table 3-14

Vernon County Critical Facilities: Dams

Map Code	County Name	Abandon Year	Dam Official Name	Dam Size Type	Down City Miles Amount	Down City Name	(1) ESTD Haz Rating Code
57	Vernon		VOSEN, ROBERT	SMALL			
58	Vernon		WEBER, DONALD	SMALL			
59	Vernon		DREGNE, CLARENCE C	SMALL			
60	Vernon		BRUDOS, ROBERT	SMALL			
61	Vernon		SCOVILLE, EDWARD A	SMALL			
62	Vernon		HOLTE, CHESTER	SMALL			
63	Vernon		MCDEVITT, WILLIAM P.	SMALL			
64	Vernon		BENISH, JAMES JR. #1	SMALL			
65	Vernon		BENISH, JAMES JR. #2	SMALL			
66	Vernon		BERGER, ALTON	SMALL			
67	Vernon		BROWN, BRYCE	SMALL			
68	Vernon		BUCKLES, GEORGE W.	SMALL			
69	Vernon		BURCH, DONALD D.	SMALL			
70	Vernon		BURKHARDT, ORVIL	SMALL			
71	Vernon		COLE, BRUCE C.	SMALL			
72	Vernon		DEWITT, MELVIN L.	SMALL			
73	Vernon		DOBBS, STACY	SMALL			
74	Vernon		ERICKSON, DOUGLAS	SMALL			
75	Vernon		ERICKSON, ROBERT	SMALL			
76	Vernon		ERICKSON, SHERMAN	SMALL			
77	Vernon		FRONK, BERNARD	SMALL			
78	Vernon		HANSEN, ORBIN	SMALL			
79	Vernon		HANSON, DAVID L.	SMALL			
80	Vernon		HARRIS, CYRIL	SMALL			
81	Vernon		ILSTRUP, W.C.	SMALL			
82	Vernon		KIRKLAND ENTERPRISES	SMALL			
83	Vernon		LAFLASH, J.C.	SMALL			
84	Vernon		LORENZ, GLENN E.	SMALL			
85	Vernon		MARKIEWICZ, JOHN	SMALL			
86	Vernon		MILLER, VILAS	SMALL			
87	Vernon		OFFERDAHL, OTIS	SMALL			
88	Vernon		OLDENBURG, WESLEY	SMALL			
89	Vernon		PEDRETTI, VICTOR	SMALL			
90	Vernon		PUDER, BERNARD J.	SMALL			
91	Vernon		READ, CHARLES	SMALL			
92	Vernon		RUDIE, EDWIN NO.1	SMALL			
93	Vernon		RUDIE, EDWIN NO.2	SMALL			
94	Vernon		SCHUMACKER, HAROLD	SMALL			
95	Vernon		SCOVILLE, ED A. SR.	SMALL			
96	Vernon		SEBION, CLAUDE M.	SMALL			
97	Vernon		SMAIL, JOHN	SMALL			
98	Vernon		SOLBERG, KENNETH	SMALL			
99	Vernon		WALDENBERGER, JULIUS	SMALL			
100	Vernon		WILLIAMS, HARLAN	SMALL			

Table 3-14
Vernon County Critical Facilities: Dams

Map Code	County Name	Abandon Year	Dam Official Name	Dam Size Type	Down City Miles Amount	Down City Name	⁽¹⁾ ESTD Haz Rating Code
101	Vernon		WINSAND, ROBERT	SMALL			
102	Vernon		WISTENBERG, WALLACE	SMALL			
103	Vernon		OLSON, OSMOND	SMALL			
104	Vernon		DOBBS, ROY	SMALL			
105	Vernon		MCCLURE, JAMES	SMALL			
106	Vernon		DENMAN, FRANCIS	SMALL			
107	Vernon		KOLOWRAT, DENNIS NO.2	SMALL			
108	Vernon		KOLOWRAT, DENNIS NO.1	SMALL			
109	Vernon		BAD AXE STRUCTURE NO. 11	LARGE	3	Newton	S
110	Vernon		GENOA -UP				
111	Vernon		GENOA -DN				
112	Vernon		COON VALLEY DAM				
113	Vernon		ROCKTON DAM				
114	Vernon		CUSHMAN DAM				
115	Vernon		CHASEBURG				
116	Vernon		MCGARRY	SMALL			L
117	Vernon		HELBING	SMALL			L
118	Vernon		WISCONSIN LAND CO.	SMALL			L
119	Vernon		SCHAEFER	SMALL			L
120	Vernon		KUBARSKI	SMALL			L
121	Vernon		ROSE	SMALL		NONE	L

See Map 3.5 for the location of these dams.

A dam with a structural height of over 6 feet and impounding 50-acre feet or more or having a structural height of 25 feet or more and impounding more than 15-acre feet is classified as a large dam.

(1) Dams are classified as Low, Significant or High Hazard. A dam is assigned a rating of High Hazard when its failure would put lives at risk. The "hazard" rating is not based on the physical attributes, quality or strength of the dam itself, but rather the potential for loss of life or property damage should the dam fail.

Source: State of Wisconsin - Department of Natural Resources

Table 3-15

Dam Failure Impact Summary

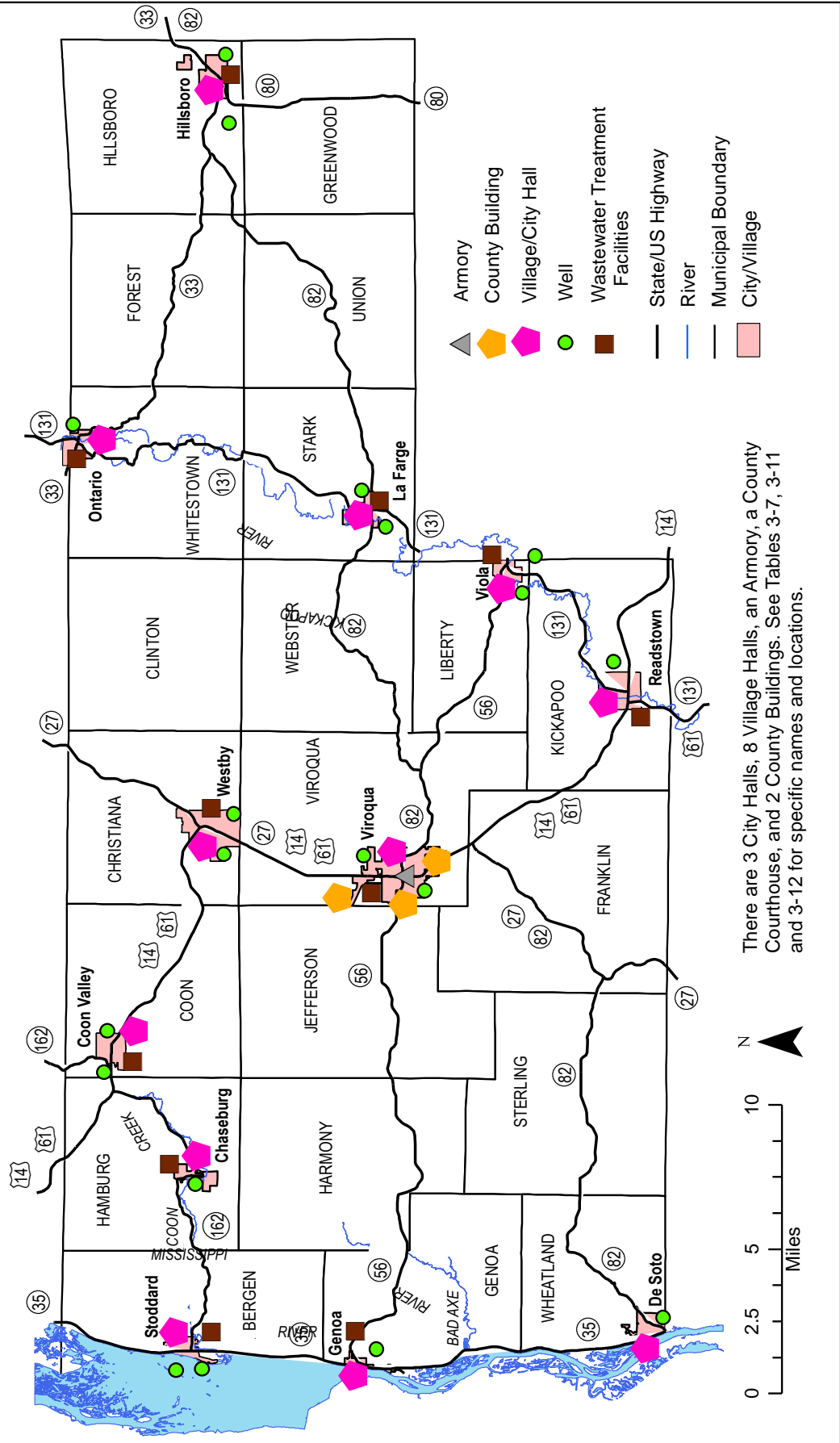
Dam Name	Roads Impacted	# Bus./Ind. Impacted*	Agri. Crops Impacted**	Dam Hazard Rating	Emergency Evacuation Plan Recommended
Bad Axe 2	Springville Rd., Miller Rd.		\$ 32,000	High	Yes
Bad Axe 11	Irish Ridge Rd., CTH O, Upper Newton Rd., STH 56, North Ridge Rd.		\$ 230,000	Significant	No
Bad Axe 12	Upper Newton Rd., CTHO, North Ridge Rd., STH 56		\$ 221,000	High	Yes
Bad Axe 16	Hornby Hollow Rd., CTH NN		\$ 63,000	High	Yes
Bad Axe 17	CTH NN		\$ 52,000	High	Yes
Bad Axe 24	Hornby Hollow Rd., CTH NN		\$ 14,000	Low	No
Bad Axe 33	CTH N, S. Creek Rd., Town Rd.		\$ 164,000	Low	No
Bad Axe 34	CTH N, S. Creek Rd., Town Rd.		\$ 164,000	Low	No
Coon Creek 14	None		\$ 5,000	Low	No
Coon Creek 15	CTH P, Town Rd.	1	\$ 17,000	Low	No
Coon Creek 16	None		\$ 4,000	Low	No
Coon Creek 17	CTH P, Town Rd.	1	\$ 8,000	Significant	No
Coon Creek 41	CTH P, Town Rd.	1	\$ -	High	Yes
W. Fork Kickapoo 1***	Knapp Valley Rd., CTH P,		\$ 89,000	High	Yes
W. Fork Kickapoo 3	CTH P, CTH S		\$ 17,000	High	Yes
W. Fork Kickapoo 4	CTH Y, CTH S, STH 82		\$ 134,000	High	Yes
W. Fork Kickapoo 5	CTH S, STH 82		\$ 134,000	High	Yes
W. Fork Kickapoo 12	67th Dr		\$ 5,000	Low	No
W. Fork Kickapoo 16	Town Rd., CTH S		\$ 18,000	Low	No
W. Fork Kickapoo 17	STH 56	2	\$ 209,000	Significant	No
W. F. Kickapoo-Klinkner	32nd Dr., Town Rd.		\$ 14,000	High	Yes
W. F. Kickapoo-Mlsna	Knapp Valley Rd., Town Rd		\$ 14,000	High	Yes

* The same business/industry would be impacted by the failure of Coon Creek Dam 15, 17 or 41.

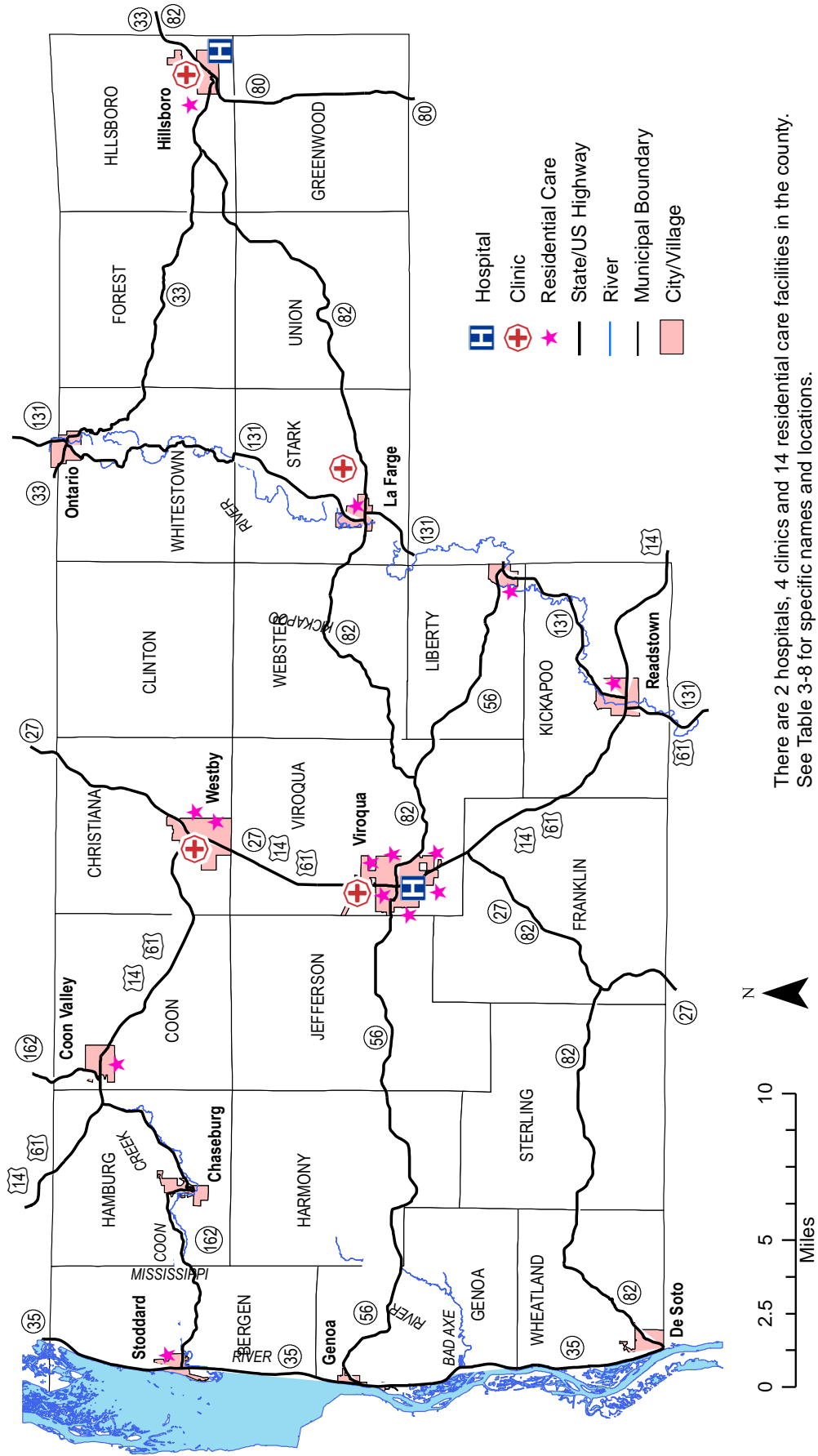
** Impact in 1995 Dollars.

*** The Dam Hazard Assessment for W. Fork Kickapoo 1 concluded that the dam's left abutment is highly conducive and susceptible to hydraulic fracturing and possible failure should the reservoir reach the top of the dam.

Map 3-1
Vernon County Critical Facilities
Government, Military, Wastewater Treatment Facilities and Wells

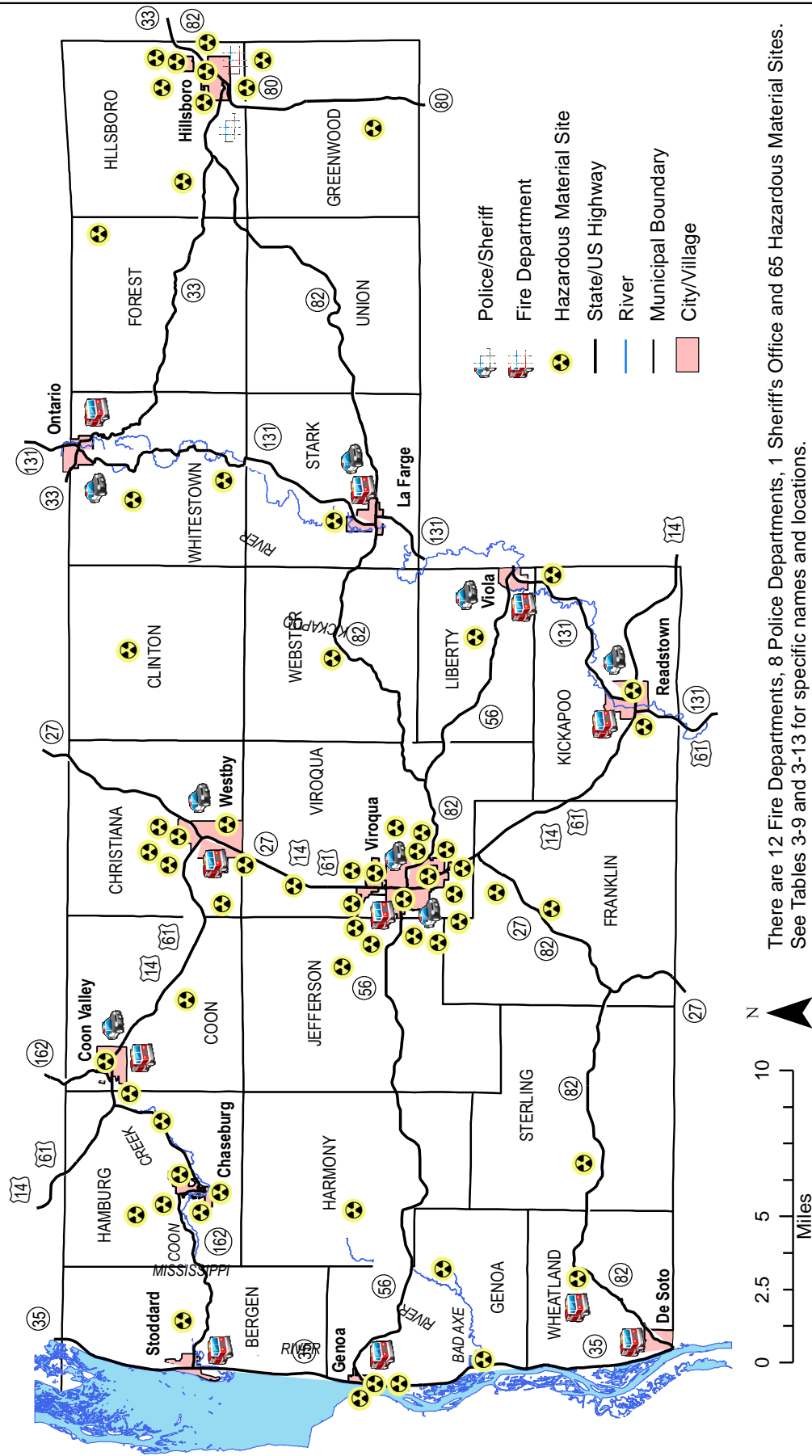


Map 3-2
Vernon County Critical Facilities
Hospitals, Clinics and Residential Care



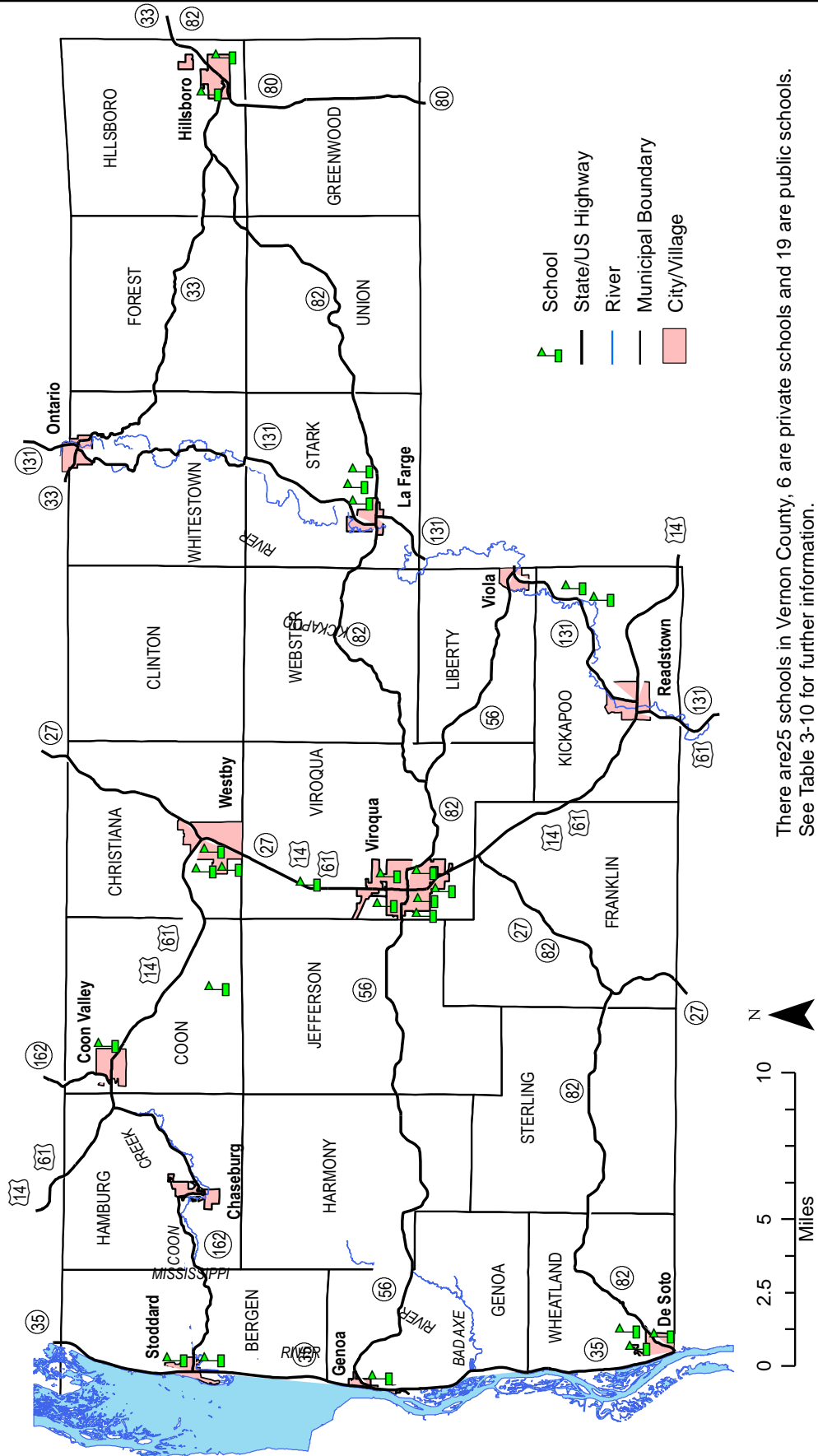
There are 2 hospitals, 4 clinics and 14 residential care facilities in the county.
See Table 3-8 for specific names and locations.

Map 3-3
Vernon County Critical Facilities
Police, Fire Departments and Hazardous Material Sites

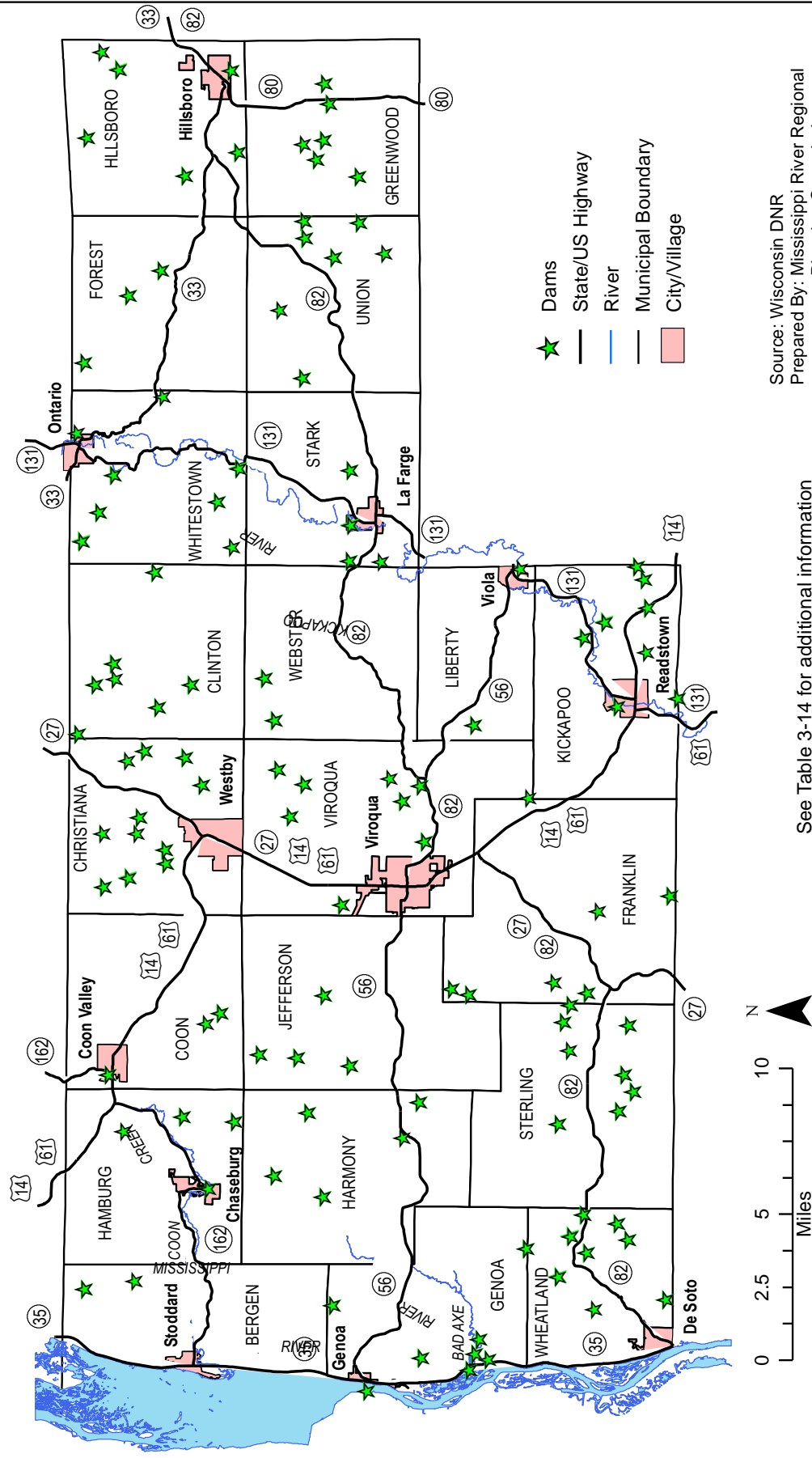


There are 12 Fire Departments, 8 Police Departments, 1 Sheriff's Office and 65 Hazardous Material Sites.
 See Tables 3-9 and 3-13 for specific names and locations.

Map 3-4
Vernon County Critical Facilities
Schools



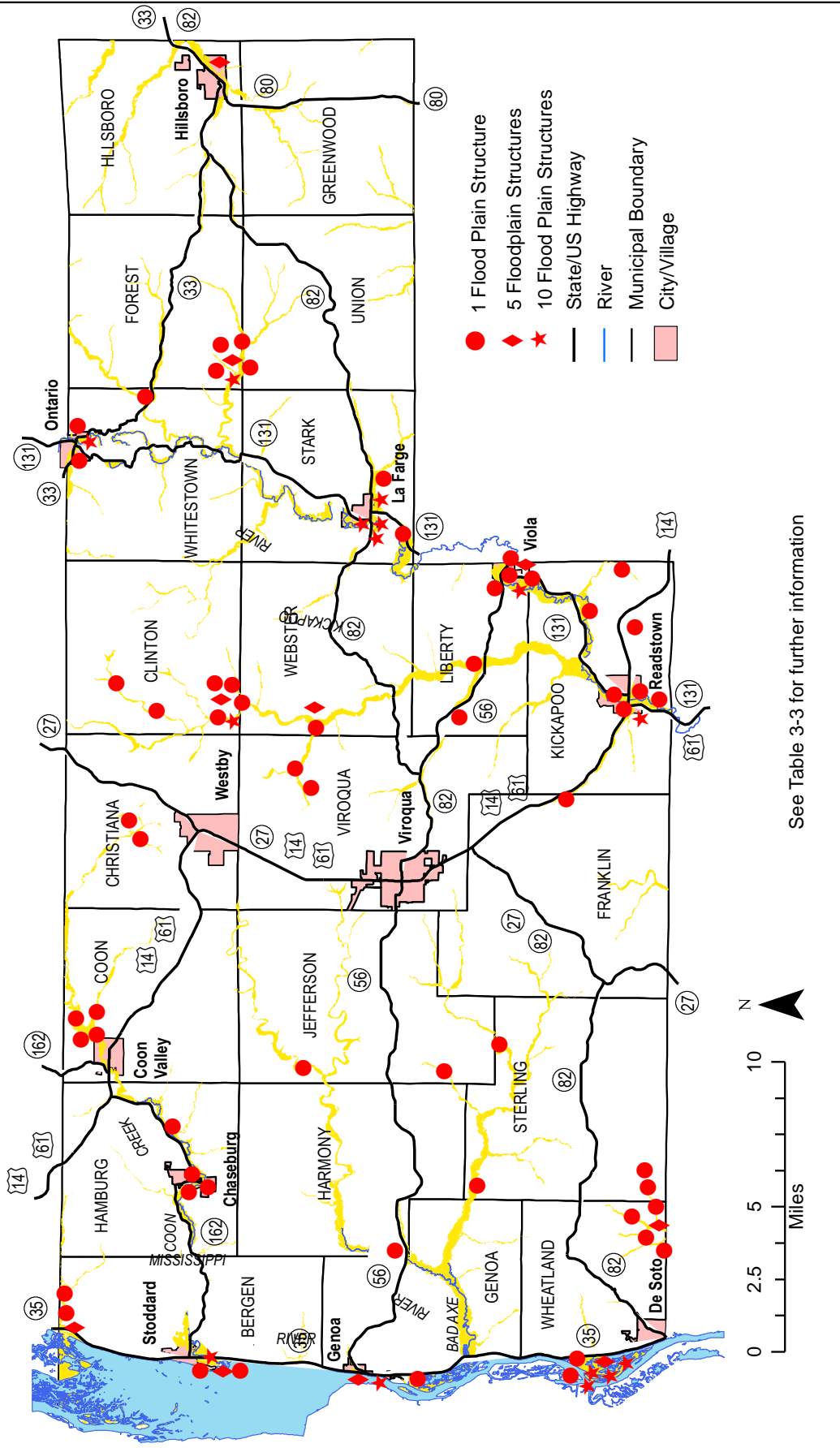
Map 3-5
Vernon County Critical Facilities
Dams



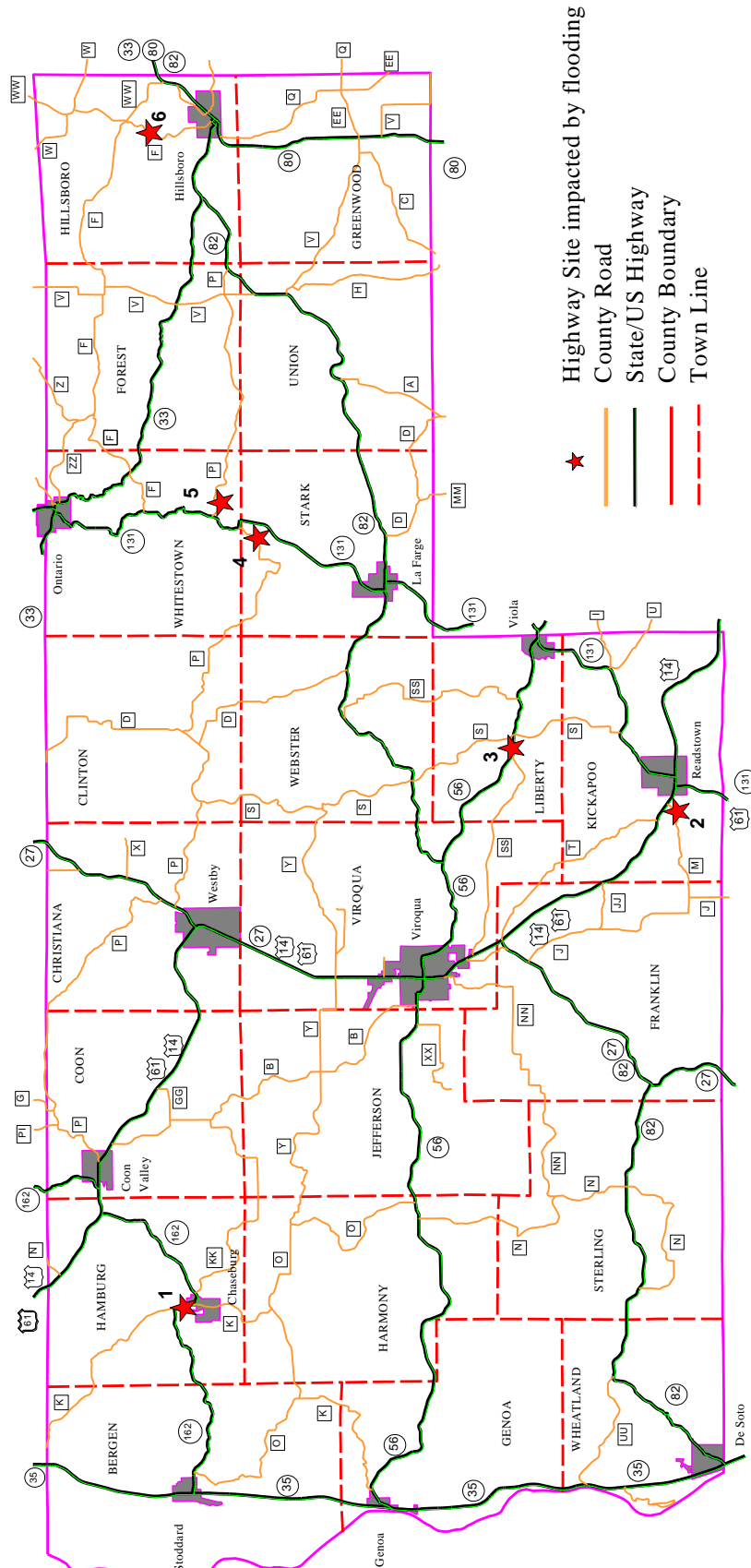
Source: Wisconsin DNR
Prepared By: Mississippi River Regional
Planning Commission

See Table 3-14 for additional information

Map 3-6
Vernon County Critical Facilities
Structures within the FEMA 100-Year Flood Boundary



Map 3-7 Vernon County State and County Trunk Highways Impacted By Flooding



4.0 VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN STRATEGIES

The County's villages, city and towns overall multi-hazards mitigation goal is to identify economical and environmentally sound ways to protect life, health and property from future hazards.

The following is a list of projects and actions by local governments or organizations that are designed to achieve this goal that collectively serve as an overall strategy for hazard mitigation. These goals, actions and projects are the result of the public participation process outlined in Chapter One and the hazard risk assessment conducted in Chapter 3. Cost effectiveness is not used to prioritize projects due to costs being unknown until the time that the project study is actually launched. A cost effectiveness study will be completed when costs for the project are known and sources of funds have been committed to undertake them. The project timetable on the following pages is how the County and municipalities will prioritize these goals, actions and projects. The project timetable listed for each of the municipalities was obtained from the respective municipality officials. Municipal officials did stress that due to financial considerations if funding for a specific project becomes available then that specific project would become its priority. Once funding becomes available a cost benefit review would be completed to prioritize which projects would be completed. Due to reductions in budgets and loss of State Aids most projects listed the Vernon County Multi-Hazards Mitigation Plan 2012 - 2016 have been carried over or deferred to this plan.

VERNON COUNTY SPECIFIC HAZARD GOALS, ACTIONS AND PROJECTS

The following is a list of goals Vernon County has developed for the various hazards

**Table 4-1 Vernon County
Hazard Mitigation Goals**

Hazard	Goal
Flooding, Stormwater Drainage, and Dams	<i>Protect the health and safety of residents and property in high water events by improving infrastructure and warning and communication systems.</i>
Hail, Lightning, Thunderstorm and Fog	<i>Inform residents on the dangers of hail, lightning, thunderstorm and fog hazards and take actions to improve warning and communications and reduce losses from these hazards</i>
Tornadoes and High Winds	<i>Protect the health safety and welfare of residents and property by improving emergency communication systems and shelters.</i>
Extreme Cold and Heat Event Hazards	<i>Provide educational information to the public on the dangers of extreme heat and cold to reduce future loss of life.</i>
Forest and Wildland Fire Hazards	<i>Protect residents and property from forest and wild land fires.</i>
Heavy Snow and Ice Storms and Blizzard Hazards	<i>Inform the public about the threat of heavy snow and ice storms and blizzards and take actions to improve warning and communications and reduce future losses from these hazards.</i>
Earthquake, Landslide and Subsidence Hazards	<i>Lessen the impact of earthquakes, landslides, and subsidence on persons and property</i>
Agricultural and Drought Hazards	<i>Inform the public on the hazards associated with drought and provide information on methods to reduce water usage and minimize agricultural losses.</i>
Pandemic Flu Hazards	<i>Inform the public on the hazards associated with pandemic flu and provide information on methods to reduce future losses.</i>
Railroads	<i>Inform the public on the hazards associated with railroads and provide information on methods to reduce future losses.</i>
River Traffic / Cargo	<i>Inform the public on the hazards associated with river traffic / cargo that passes through Vernon County and provide information on methods to reduce future losses.</i>

The following is a list of Multi-Hazard Mitigation Actions and Projects to be implemented by Vernon County.

Table 4-2
Vernon County
Hazard Mitigation Actions or Projects

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Flooding, Storm water Drainage, and Dam Hazards Actions and Projects				
Investigate the concept of a voluntary floodplain property buyout/relocation program through a survey of property owners in the floodplain. This survey could also inquire about interest in flood proofing and/or elevating their properties to protect health, public safety and welfare.	Existing County staff resources	Emergency Management Committee	Continual	Carried over, this project will be on-going until all floodplain structures are mitigated
Continue to monitor and enforce N.R. 116 Floodplain, Shore Land - Wetland Regulations and any changes to it.	County Zoning Administrator	County Zoning Administrator	Annually	Carried over from previous plan
To maintain the County's compliance with the National Flood Insurance Program the County will undertake the following actions: 1) The County Zoning Administrator shall annually attend floodplain zoning seminars and workshops to keep informed on floodplain issues and regulations. 2) The County Zoning Administrator shall report monthly on floodplain permit activity to the Emergency Management Committee. 3) The County Zoning Administrator shall administer, enforce and update the County's floodplain ordinance as prescribed by law.	Existing County staff resources	County Zoning Administrator	Annually	Carried over from previous plan, relates to NFIP compliance
Work to reduce or eliminate repetitive loss or substantially damaged structures by undertaking the following: 1) The Emergency Management Coordinator shall biannually write a letter to owners of repetitive loss structures or substantially damaged structures to inform them of techniques and potential state and federal resources available to reduce further flood losses. Specific emphasis will be placed on contacting them if the County, City or a Village proceeds with a voluntary buyout program as described above. 2) Inform property owners through the annual Survey to act as a resource for information and answer questions on how to reduce future flood losses.	Existing County staff resources	County Emergency Management Director	Biannually	Carried over from previous plan
Promote the National Flood Insurance Program through community education	Existing County staff resources	Emergency Management Committee	Continual	Deferred, relates to NFIP compliance
Consider developing a County Driveway Ordinance that requires new driveways and access roads operable for large or emergency equipment during flood events.	Existing County staff resources	County Zoning Committee and Emergency Management Committee	2019-2020	Deferred
Review flood disaster impacts and revise and update this plan as needed after a flood disaster. New flood hazard mitigation projects and strategies are likely to arise after a flood disaster. To deal with this situation the County Emergency Management Coordinator and Zoning Administrator shall meet and report in a timely manner to the County Emergency Management Committee on potential changes to the County's Multi-Hazard Mitigation Plan. The Emergency Management Committee shall recommend reaffirming, amend or update (rewrite) this plan to the County Board.	Existing County staff resources	Emergency Management Committee, County Zoning Administrator, County Emergency Management Director	After each flood disaster	Carried over from previous plan
Purchase a rescue/patrol boat for the Mississippi River.	Grants	County Emergency Management Director	2020	Carried over from previous plan

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Purchase mobile homes which can be used as temporary housing for displaced residents	Grants	Emergency Management Director	As grant funding becomes available	New Project
Purchase water dams to be used as temporary flood protection	Grants	Emergency Management Director	As grant funding becomes available	New Project
Lower County Highway KK to lessen road damage due to flooding. Allowing flood waters to flow over the top of the road.	Grants	County Highway Department	As grant funding becomes available	New Project
Build a flood wall in County Highway P valley near the Village of Chaseburg to redirect flood waters.	Grants	County Highway Department	As grant funding becomes available	New Project
Create a new position within the Land Conservation Department for the purpose of: <ul style="list-style-type: none"> mapping and documenting of current and historical flood damages designing flood mitigation, water retention and conservation practices 	Grants	County Land Conservation Department	As funding becomes available	New Project
Develop mapping and model flood mitigation priorities	Grants	County Land Conservation Department	As funding becomes available	New Project
Utilize modeling, including EVAAL to identify priority areas for conservation and mitigation practices and projects	Grants	County Land Conservation Department	As funding becomes available	New Project
Develop a road/culvert inventory and documenting of "digital dams" that interfere with watershed modeling	Grants	County Land Conservation Department	As funding becomes available	New Project
Develop a strategy for changed practices (sizing, lowering roads, etc.) for roads and culverts	Grants	County Land Conservation Department	As funding becomes available	New Project
Develop a landowner/farmer outreach program which will increase the number of practices that will retain water	Grants	County Land Conservation Department	As funding becomes available	New Project
Develop a cost-share program for flood mitigation projects	Grants	County Land Conservation Department	As funding becomes available	New Project
Conduct breach route and hydraulic shadow analysis of all 22 PL-566 Dam structures	Grants	County Land Conservation Department	As funding becomes available	New Project
Update high water warning system	Grants	County Land Conservation Department	As funding becomes available	New Project
Develop a procedure for prioritizing voluntary buyouts	Grants	County Land Conservation Department	As funding becomes available	New Project
Conduct a Cost-Benefit analysis of Best Management Projects. This could include smaller dam structures, berms, swales, terraces, prairie buffers, and other practices to retain water on the landscape	Grants	County Land Conservation Department	As funding becomes available	New Project
Create a watershed-based engineering position to assist technicians (could be multi-county)	FEMA, Army Corp of Engineers, EPA, WI DNR, NRCS, County Budget	County Land Conservation Department	As funding can be obtained	New Project

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Conduct a feasibility study on the development of cost-sharing program of Rain Gardens and other storm water retention practices	Grants	County Land Conservation Department	As funding becomes available	New Project
Develop a list of areas within the county which could be cut off from emergency vehicles during flooding and develop a plan to alleviate that problem	Grants	Emergency Management Director	As funding becomes available	New Project
Work to apply concrete spread over top of heavy riprap on the following county bridges: (Some of the bridges need riprap placed under them before concrete is spread. The concrete holds the riprap in place during high water.) Install heavy riprap at all County Bridges and at Under Flow structures prone to failing under extreme flooding conditions	Unknown	County Highway Department and Emergency Management Committee	As budgets permit	Work on this project will be on-going until completed. Projects will be worked on as funding becomes available. New projects listing
Hail, Lightning, Thunderstorm and Fog Hazard				
Encourage the burying of electrical lines	Existing County staff resources	Emergency Management Committee	Continual Program	Carried over from previous plan
Encourage the burying of telecommunication lines	Existing County staff resources	Emergency Management Committee	Continual Program	Carried over from previous plan
Utilize the Severe Awareness Week to alert residents of the need for concern about hail, lightning, thunderstorm and fog hazards and actions they can take to minimize losses from these hazards.	Existing County staff resources	County Emergency Management Director	Annual Program	Carried over from previous plan
Work on improving County wide emergency communications system.	Existing County staff resources	Emergency Management Committee	2012-2014	Partially completed. Continued from previous plan
Tornadoes and High Winds				
Encourage the anchoring on new mobile home residences, carports and porches.	Existing County staff resources	Emergency Management Committee	Continual Program	Carried over from previous plan
Encourage burying of underground power, cable and telephone lines.	Existing County staff resources	Emergency Management Committee	Continual Program	Carried over from previous plan
Encourage the use of interlocked roofing shingles.	Existing County staff resources	Emergency Management Committee	Continual Program	Carried over from previous plan
Encourage the construction of safe rooms in mobile home parks and other residential structures subject to high winds.	Existing County staff resources	Emergency Management Committee	Continual Program	Carried over from previous plan
Identify buildings that would provide protection to the public in the event of a tornado or high winds.	Existing County staff resources	County Emergency Management Director	2012-2013	Coordinate this activity with buildings being inventoried for use for extreme temperature events. Deferred
Upgrade/expand EOC building	Grants	County Emergency Management Director	2013-2014	New Project
Improve and update communication and advanced warning systems	Existing County staff resources	County Emergency Management Director and Emergency Management Committee	2012-2014	Deferred. Did not get funded

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Extreme Cold and Heat Event				
Identify buildings that could be used as shelters with appropriate heating, ventilation and air conditioning for housing that segment of the population that are more vulnerable to extreme temperature events, such as the low income, elderly, and sick.	Existing County staff resources	Emergency Management Director and Emergency Management Committee in conjunction with the Cities, Villages and Towns.	2013-2015	Deferred
Investigate developing a program that provides fans to the elderly in times of extreme heat.	Existing County staff resources	Emergency Management Director and Emergency Management Committee	2013-2015	Deferred
Participate in National Heat Awareness Day by distributing information regarding heat awareness	Existing County staff resources	Emergency Management Committee	Continual Program	New project
Continue support of the Salvation Army	Existing County staff resources	Emergency Management Committee	Continual Program	Carried over from previous plan
Forest and Wildland Fire				
Promote and maintain cooperative fire agreements among area fire departments and the Department of Natural Resources.	Existing County staff resources	County Emergency Management Director	Continual Program	Carried over from previous plan
Encourage periodic cutting of Conservation Reserve Program (CRP) land per program requirements	Existing County staff resources	Emergency Management Committee and National Resource Conservation Service	Continual Program	Carried over from previous plan
Investigate developing a countywide ordinance regarding burning bans during dry seasons.	Existing County staff resources	Emergency Management Committee and County Board	2013	Deferred
Heavy Snow and Ice Storms and Blizzard				
Prepare timely releases that inform the public on actions and precautions they can take to minimize disruptions and losses	Existing County staff resources	County Emergency Management Director	Annually	Carried over from previous plan
Identify locations in the County where snow fences could be constructed or trees and bushes (living snow fence) could be planted to increase motor vehicle safety.	Existing County staff resources	County Emergency Management Director in cooperation with the County Highway Commissioner and Highway Committee	2012 - 2013	Deferred. Less of a priority
Earthquake, Landslide and Subsidence				
Investigate developing an inventory/prioritization of roads/road segments that have shoulders with slopes conducive to erosion and land/mud slides. The roads/road segments identified can be stabilized as funding becomes available.	Existing County staff resources	County Emergency Management Director in cooperation with the County Highway Commissioner and Public Safety Committee	2013-2014	Deferred. Less of a priority

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Map karst features within the county	Grants	County Land Conservation Department	As funding becomes available	New Project
Consider developing a zoning ordinance regarding width, slope, and maintenance of driveways.	Existing County staff resources	County Zoning Committee and Emergency Management Committee	2012-2013	Deferred. Less of a priority
Agricultural and Drought				
Consider developing an education/information program that informs agricultural producers and residents about water conserving measures and crop insurance.	Existing County staff resources	County Emergency Management Director in cooperation with City, Village and Town Officials	2012-2013	Deferred, was not placed in any departments budget
Pandemic Flu				
Develop a pandemic flu plan listing specific actions and identifies emergency powers and who has the authority to use them.	Existing County staff resources	Public Health officer in cooperation with City Officials, Village Officials, Emergency response personnel and local hospitals and clinics	2020-2022	New Project
Train Derailment				
Develop evacuation plans for the Village of Stoddard, Genoa and De Soto	Existing County staff resources	County Emergency Management Director in cooperation with city and village officials		New Project
Additional training for emergency responders	Grants and BNSF	County Emergency Management Director in cooperation with first responders' organizations	Continual program	New Project
Develop a procedure for disseminating public information during events	Existing County staff resources	County Emergency Management Director and the County Administrator		New Project
Develop a sheltering plan	Existing County staff resources	County Emergency Management Director		New Project
Purchase electronic highway signs for detours and road closures	Grants	County Highway Dept.		New Project
Develop an Emergency Alert system for notification of County residents during emergencies	Existing County staff resources	County Administrator		New Project
Update Emergency Operations Center – update staff and equipment, obtaining additional training	HMP grants	County Emergency Management Director		New Project
Train additional drone operators	Grants	County Emergency Management Director		New Project
River Traffic				
Improve communications between County and US Army Corp of Engineers	Existing County staff resources	County Emergency Management Director and Lock Masters	2019-2020	New Project

Mitigation Projects for Municipalities

The following list of Multi-Hazard Mitigation Actions and Projects have been compiled from a mitigation project survey each municipality completed, individual conversations and at public meetings. These projects will be implemented by the Cities of Hillsboro, Viroqua, Westby, the Villages of Chaseburg, Coon Valley, De Soto, Genoa, La Farge, Ontario, Readstown, Stoddard and Viola and the Towns of Bergen, Christiana, Clinton, Coon, Forest, Franklin, Genoa, Greenwood, Hamburg, Harmony, Hillsboro, Jefferson, Kickapoo, Liberty, Stark, Sterling, Union, Viroqua, Webster, Wheatland and Whitestown.

Table 4-3
Vernon County Municipal
Hazard Mitigation Actions or Projects

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Flooding, Storm water Drainage, and Dam Hazards Actions and Projects				
In conjunction with the County investigate the concept of a voluntary floodplain property buyout/relocation program through a survey of property owners in the floodplain. This survey could also inquire about interest in flood proofing and/or elevating their properties to protect health, public safety and welfare.	Existing Village and County staff resources to investigate	County Emergency Management Director to serve as coordinator	2018-2022	Continual program, determine interest on an area by area basis
Continue to monitor and enforce N.R. 116 Floodplain, Shore Land - Wetland Regulations and any changes to it.	Existing Village and City resources	Village or City Board or designee	Annually	Continual Program
Work to reduce or eliminate repetitive loss or substantially damaged structures by undertaking the following: 1) The Village or City Clerk or designee biannually shall provide a list of owners of repetitive loss structures or substantially damaged structures within the Village or City to the County Emergency Management Director. The County Emergency Management Director will then biannually write a letter to owners of repetitive loss structures or substantially damaged structures to inform them of techniques and potential state and federal resources available to reduce further flood losses. Specific emphasis will be placed on contacting them if the County, City or a Village proceeds with a voluntary buyout program as described above. 2) Inform property owners through the annual Survey to act as a resource for information and answer questions on how to reduce future flood losses.	Existing Village, City and County staff resources	Village or City Board or designee and the County Emergency Management Director	Biannually	Carried over from previous plan
In conjunction with the County investigate the idea of promoting the National Flood Insurance Program through a community seminar where federal and state officials would be able to present the program and answer questions.	Existing Village, City and County staff resources	Village or City Board or designee and the County Emergency Management Director	2018-2019	Deferred, relates to NFIP compliance
To maintain compliance with the National Flood Insurance Program the Village/City will undertake the following actions: 1) The Village/City Clerk or designee shall annually attend floodplain zoning seminars and workshops to keep informed on floodplain issues and regulations. 2) The Village/City Clerk or designee shall report monthly on floodplain permit activity to the Village Board. 3) The Village/City Clerk or designee shall administer, enforce and update the municipality's floodplain ordinance as prescribed by law.	Existing Village/City staff and resources	Village/City Clerk or designee	Annually	Carried over from previous plan, relates to NFIP compliance
Add a river gauging station near the Village of Ontario to monitor the river levels from the Brush Creek	Grants	County Emergency Management Director	2019-2020	New Project

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Work in conjunction with the County to review flood disaster impacts and revise and update this plan as needed after a flood disaster. New flood hazard mitigation projects and strategies are likely to arise after a flood disaster. To deal with this situation the Village/City Clerk or designee shall meet and report in a timely manner to the Village/City Board on potential changes to the Village's portion of the Vernon County Multi-Hazard Mitigation Plan. The Village Board shall recommend reaffirming, amend or update (rewrite) this plan to the County Emergency Management Coordinator and the Emergency Management Committee. This disaster assessment may be included in the annual review process discussed in the Plan Maintenance and Adoption section of this plan if the response to the recent flood disaster will not be impaired by doing so.	Existing Village and County staff resources	Village Clerk or designee, La Farge Village Board, Emergency Management Coordinator, Emergency Management Committee	After each flood disaster	Carried over from previous plan
Hail, Lightning, Thunderstorm and Fog Hazard				
Encourage the burying of electrical lines	Existing City, Village, Town and County staff resources	Individual municipal Boards in conjunction with the County Emergency Management Committee	Continual Program	Carried over from previous plan
Encourage the burying of telecommunication lines	Existing City, Village, Town and County staff resources	Individual municipal Boards in conjunction with the County Emergency Management Committee	Continual Program	Carried over from previous plan
Assist the County in utilizing the Severe Awareness Week to alert residents of the need for concern about hail, lightning, thunderstorm and fog hazards and actions they can take to minimize losses from these hazards.	Existing City, Village, Town and County staff resources	County Emergency Management Director coordinating with City, Town and Village Clerks	Annual Program	Carried over from previous plan
Tornadoes and High Winds				
Require anchoring on new mobile home residences, carports and porches.	Existing City, Village, Town and County staff resources	Individual municipal Boards in conjunction with the County Emergency Management Committee	Continual Program	Carried over from previous plan
Encourage the burying of underground power, cable and telephone lines.	Existing City, Village, Town and County staff resources	Individual municipal Boards in conjunction with the County Emergency Management Committee	Continual Program	Carried over from previous plan
Encourage the use of interlocked roofing shingles.	Existing City, Village, Town and County staff resources	Individual municipal Boards in conjunction with the County Emergency Management Committee	Continual Program	Carried over from previous plan
Encourage the construction of concrete safe rooms in mobile home parks and other residential structures subject to high winds.	Existing City, Village, Town and County staff resources	Individual municipal Boards in conjunction with the County Emergency Management Committee	Continual Program	Carried over from previous plan

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Identify buildings that will provide protection to the public in the event of a tornado or high winds.	Existing City, Village, Town and County staff resources	Individual municipal Boards in conjunction with the County Emergency Management Committee	Continual Program	Carried over from previous plan
Extreme Cold and Heat Event				
In conjunction with the County and adjacent municipalities identify buildings within or adjacent to their respective municipality that could be used as shelters with appropriate heating, ventilation and air conditioning for housing that segment of population that are more vulnerable to extreme temperature events, such as the low income, elderly, and sick.	Existing City, Town, Village and County staff resources	County Emergency Management Director will coordinate with each municipal board or their designee	2020-2021	Deferred
Forest and Wildland Fire				
Develop/maintain cooperative fire agreements with area fire departments and the Department of Natural Resources as necessary.	Existing City, Town and Village staff resources	City, Town and Village Boards will be responsible for their municipality	Continual Program	Carried over from previous plan
Heavy Snow and Ice Storms and Blizzard				
Cooperate with the County in preparing timely releases that inform the public on actions and precautions they can take to minimize disruptions and losses.	Existing County staff resources along with City, Town and Village staff and resources	County Emergency Management Director coordinating with City, Town and Village Clerks	Annually	Carried over from previous plan
Identify locations where snow fences could be constructed or trees/brushes (living snow fences) could be erected or planted to increase motor vehicle safety by reducing or eliminating blowing/drifting snow	Existing County staff resources along with City, Town and Village staff and resources	County Emergency Management Director and County Highway Commissioner coordinating with City, Town and Village Clerks	2020 - 2021	Deferred from previous plan, project was not budgeted for in either Highway or Emergency Management department
Earthquake, Landslide and Subsidence				
Investigate developing an inventory/prioritization of roads/road segments that have shoulders with slopes conducive to erosion or land /mud slides. The roads/road segments identified can be stabilized as funding becomes available.	Existing City, Village/ and Town staff resources	City, Town or Village Board or designee	2019-2020	Deferred
Agricultural and Drought				
In conjunction with the County consider developing an education/information program that informs agricultural producers and residents about water conserving measures and crop insurance.	Existing County staff resources	County Emergency Management Coordinator in cooperation with City, Village and Town Officials	2021-2022	Deferred

Individual Municipal Projects

The following is a list of Multi-Hazard Mitigation Actions and Projects which individual municipalities have identified in addition to the projects listed in Table 4-3.

Table 4-4
Municipal Specific Hazard Mitigation Actions or Projects

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Flooding, Storm water Drainage, and Dam Hazards Actions and Projects				
Town of Bergen – repair Cedar Valley Road along Coon Creek	Grants and Town Budget	Town Board	As funding becomes available	New Project
Town of Christiana - Road Improvements 1) Nyhus Road – replace or widen existing box culvert; 2) East Ridge Hill – replace or widen cement box culvert; 3) Lovaas Ridge Hill – replace bridge; 4) Hegge Road – replace bridge; 5) Unseth Road – replace bridge; 6) Lars Hill Road – Make repairs to cement wing walls and replace guard rail on existing bridge; 7) Nilsestuen Road – widen or replace cement box culvert.	Grants and Town Budget	Town of Christiana Board	As funding becomes available	Carried over from previous plan
Town of Clinton – Replace steel culvert with concrete culverts on roads with continuous water flow	Grants and Town Budget	Town Board	2019	New Project
Town of Clinton – Add extensions to culverts to get running water further from roads to reduce wash outs	Grants and Town Budget	Town Board	2019	New Project
Town of Clinton – Put aprons on more culverts to reduce brush and other debris flowing into and plugging them	Grants and Town Budget	Town Board	2019	New Project
Town of Coon - Strangstalien Valley Road – short bridge will be replaced with a box culvert	Grants and Town Budget	Town Board	As funding becomes available	Carried over from previous plan
Town of Coon - Approach to Old Line Road will be corrected	Grants and Town Budget	Town Board	As funding becomes available	Carried over from previous plan
Town of Forest – Upsize culverts in Township to correct problem areas using steel and/or concrete box culverts	Grants and Town Budget	Town Board	As funding becomes available	New project
Town of Greenwood – Purchase flat bottomed boat for fire department/ first responders	Grants	Yuba Fire/EMS	As funding becomes available	New Project
Town of Greenwood – Purchase emergency signs and cones for road closures	Grants and Town Budget	Town Board	2019	New project
Town of Harmon – Upsize culvert on Newton Road and Munyon Lane	Grants and Town Budget	Town Board	2019	New project
Town of Harmon – Riprap deteriorating creek bank where Bad Axe River meets Newton Valley Road	Grants and Town Budget	Town Board	2019	New project
Town of Stark – Increase culvert sizes or raise roads along Weister Creek	Grants and Town Budget	Town Board	As funding becomes available	New Project
Town of Stark – Purchase road closed signs	Grants and Town Budget	Town Board	As funding becomes available	New Project
Town of Union – Seal coat all remaining gravel roads	Town Budget	Town Board	As funding becomes available	New Project
Town of Union – Repair earthen berm and upsize culvert on Twin Ash Road	Town Budget	Town Board	As funding becomes available	New Project

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Town of Viroqua - Bridge replacement on Deaver Lane over Bishop Creek	\$150,000	Town Chairman	As funding becomes available	Deferred
Town of Viroqua - Road improvements: 1) Culvert improvement and road raising – Seasbranch Road; 2) Culvert improvement at M&T Rock Quarry	Grants and Town Budget	Town of Viroqua Board	Unknown	Carried over from previous plan
Town of Wheatland - Road Improvements: 1) Replace damaged box culvert and failing retaining wall in Victory 2) Also replace 2 ditch culverts along Stevens Road.	FEMA grants and Town budget	Town of Wheatland Board	As funding becomes available	Carried over from previous plan
Town of Wheatland – Replace Terhune Road bridge.	FEMA grants and Town budget	Town of Wheatland Board	As funding becomes available	New Project
Town of Whitestown - Cut Off Bridge improvements	FEMA grants and Town budget	Town of Whitestown Board	As funding becomes available	Carried over from previous plan
Town of Whitestown - Big Valley Bridge	FEMA grants and Town budget	Town of Whitestown Board	As funding becomes available	Carried over from previous plan
Village of Chaseburg - Sewage treatment plant upgrade and sewer line improvements	Grants and Village Budget	Brian Dayton, Maintenance Department, 608-483-2660	As funding becomes available	Deferred
Village of Chaseburg – Purchase emergency backup generators for lift stations and well house	Grants and Village Budget	Brian Dayton, Maintenance Department, 608-483-2660	As funding becomes available	New Project
Village of Chaseburg - Waterline and storm water control improvements	Grants and Village Budget	Brian Dayton, Maintenance Department, 608-483-2660	As funding becomes available	Deferred
Village of Chaseburg – Bank stabilization along Coon Creek, due to erosion and banks eroding trees lining the creek are beginning to fall into the creek and washing downstream to the STH 162 bridge forming a dam and causing additional flooding and road erosion	Grants and Village Budget	Village Board	As funding becomes available	Carried over from previous plan
Village of Coon Valley - Creek bank improvement along the Coon Creek in the handicapped fishing area	Grants and Village Budget	Renita Williamson	As funding becomes available	Deferred, not funded
Village of Coon Valley – Construct stormwater catch basins and upgrade existing pipes	Grants and Village Budget	Renita Williamson	As funding becomes available	New Project
Village of Coon Valley – Update and raise lift stations	Grants and Village Budget	Renita Williamson	As funding becomes available	New Project
Village of De Soto – Culvert replacement, asphalt surfacing of Treadwell St.				Completed
Village of De Soto – Raise manhole elevations on manhole numbers 7B and 7C and install sealed covers.	Grants and Village Budget	Steve Holt, Maintenance Dept., 608-648-2111	As funding becomes available	Carried over from previous plan
Village of De Soto – replace 5,100 feet of sewer main due to infiltration and inflow problems	Grants and Village Budget	Village Board, Town Chairman, Dave Robertson, 608-648-3388	Unknown	Carried over from previous plan
Village of La Farge – Culvert Improvements, South Silver St, South Main Street.	Grants and Village Budget	Public Works Manager	When funding can be obtained	Carried over from previous plan
Village of La Farge – Storm Water Improvements, South Silver St, South Mill Street.	Grants and Village Budget	Public Works Manager	When funding can be obtained	Carried over from previous plan
Village of La Farge – Drainage Channel Improvements, main drainage channel from N. Silver St. to North Mill Street.	Grants and Village Budget	Public Works Manager	When funding can be obtained	Carried over from previous plan

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Village of La Farge – Relocate electrical utility building	Grants and Village Budget	Public Works Manager	When funding can be obtained	New Project
Village of Stoddard – Install larger outflow pipes for stormwater discharge under BNSF railroad tracks at Badger St.	Grants and Village Budget	Kent Hablestad, 608-457-2136	When funding can be obtained	Carried over from previous plan
Village of Stoddard – Replace water and sewer lines on Main St. (State Highway 35).	Grants and Village Budget	Kent Hablestad, 608-457-2136	When funding can be obtained	Carried over from previous plan
Village of Stoddard – Replace water and sewer lines on Cottage St.	Grants and Village Budget	Kent Hablestad, 608-457-2136	When funding can be obtained	Carried over from previous plan
Village of Stoddard – Install an additional water and sewer line crossing at Division St.	Grants and Village Budget	Kent Hablestad, 608-457-2136	When funding can be obtained	Carried over from previous plan
Village of Viola – During flooding events there is only one way out of the Village and that is along an unpaved narrow local road. The Village would like to have this road paved and widened to allow for better emergency vehicle access.	Grants and Village Budget	Village Board or designee	As funding becomes available	Carried over from previous plan
Village of Viola – Raise York Street 2 feet to allow access during moderate floods	Grants and Village Budget	Village Board or designee	When funding can be located	Carried over from previous plan
City of Hillsboro – Develop a dam Emergency Action Plan	Grants and City Budget	City Administrator	2019 – 2021	Carried over from previous plan
City of Hillsboro – Conduct a dam inspection and develop a dam maintenance and repair schedule	Grant/City Budget	City Administrator	2020 – 2022	Carried over from previous plan
City of Hillsboro – Dam spillway reconstruction	City Budget	City Administrator	2020 – 2022	New Project
City of Hillsboro – Levee/floodproofing & stormwater improvements	City Budget	City Administrator	2020 – 2022	New Project
City of Hillsboro – Field Veterans Memorial Lake dredging	City Budget	City Administrator	2020 – 2022	New Project
City of Hillsboro – CTH FF / East Madison St. bridge expansion	City Budget	City Administrator	2019 – 2021	New Project
City of Viroqua – Identify and correct stormwater drainage issues around the city	City Budget	Director of Public Works	2020 – 2022	New Project
City of Westby – Melby Street and Ramsland Street storm sewer improvements	City Budget	Public Works Director	2019	New Project
City of Westby – West Avenue and Davidson Avenue storm sewer improvements	City Budget	Public Works Director	2019	New Project
City of Westby – West Avenue South and Highland Street storm sewer improvements	City Budget	Public Works Director	2020	New Project
City of Westby – Purchase generator to run lift stations during power outages.	Grants and City Budget	City Council and Zoning Administrator	2019	Carried over from previous plan
City of Westby – Revise & Construct storm waterway on Willow, Bergum and Highland Streets to accommodate more flow without flooding basements in this area	Grants and City Budget	City Engineer	2021	Carried over from previous plan
Vernon Memorial Hospital – Purchase backup generators for their outlying facilities	Grants and Hospital Budget	Emergency Management Director	2019-2022	New Project
Hail, Lightning, Thunderstorm and Fog Hazard				
Village of Chaseburg – Purchase surge protectors for the sewer plant, well house and village offices	Grants and Village Budget	Maintenance Dept.,	2019	Carried over from previous plan
Village of De Soto – Install backup generator at main lift station	Grants and Village Budget	Village Board	2019	New Project

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Village of La Farge – Warning & Communication Equipment – new signage, barricades and traffic cones	Grants and Village Budget	Public Works Manager	When funding can be obtained	Carried over from previous plan
Village of Stoddard – Purchase hand held multi-channel two-way radios	Grants and Village Budget	Kent Hablestad, 608-457-2136	When funding can be obtained	Carried over from previous plan
Tornadoes and High Winds				
Town of Coon – Investigate designating an emergency channel for emergency personnel communication	Existing Town and County resources	County Emergency Management Coordinator	2020	Deferred
Town of Coon – Training of emergency personnel for the possibility of loss of communication due to loss of power	Existing Town and County resources	County Emergency Management Coordinator	When funding can be obtained	Deferred
Village of Coon Valley – Replace existing siren	Village Budget	Village Clerk	When funding can be obtained	Carried over from previous plan
Village of Chaseburg – Purchase a storm siren to serve the Village and portions of the Town of Hamburg	Grants and Village Budget	Village Board	When funding can be obtained	Carried over from previous plan
Village of La Farge – Purchase additional warning siren for the North side of the Village (Business Park area)	Grants and Village Budget	Public Works Manager	When funding can be obtained	Carried over from previous plan
Village of La Farge – Purchase equipment to create a public warning system (handheld radios for Village employees to be used for emergencies)	Grants and Village Budget	Public Works Manager	When funding can be obtained	Carried over from previous plan
Village of La Farge – Purchase NOAA weather radios to be distributed to Village residents	Grants and Village Budget	Public Works Manager	When funding can be obtained	Carried over from previous plan
Village of La Farge – Purchase emergency generator for Well #2 and for an emergency shelter	Grants and Village Budget	Public Works Manager	When funding can be obtained	Carried over from previous plan
Village of La Farge – Develop renewable energy system to connect to village utility to provide a backup energy source	Grants and Village Budget	Public Works Manager	When funding can be obtained	New project
Village of Readstown – Purchase a generator for the EMS building	Grants and Village Budget	Village Board	2020	Carried over from previous plan
Village of Readstown - Construct a new storm shelter that would house an emergency response center and space for residents	Grants and Village Budget	Village Board	2021	Carried over from previous plan
Village of Viola – Construct a storm shelter for residents of the mobile home park.	Grants	County Emergency Management Coordinator	2019	Carried over from previous plan
City of Hillsboro – Add third tornado siren in north section of City	Grant/City Budget	City Administrator	2019	New Project
City of Hillsboro – Purchase backup generator	Grant/City Budget	City Administrator	2019	New Project
City of Hillsboro – Construct safe rooms in hospital	Grants	Chief executive officer Gunderson, St. Joseph's hospital	2019	New Project
City of Hillsboro – add a new Weather Siren	Grant/City Budget	City Administrator	2019	New Project
City of Viroqua – Replace emergency siren in the City of Viroqua (downtown) Add another emergency siren on the Northeast part of the city.	FEMA grants and Town budget	Police Chief	2019-2020	Changed project
City of Viroqua – Purchase emergency backup generator for City Hall	FEMA grants & Town budget	Police Chief	2020	Removed project
City of Viroqua – Purchase emergency backup generator for Public Safety Building	FEMA grants & Town budget	Police Chief	2019	Deferred
City of Viroqua – Construct safe rooms for city residents	FEMA grants & Town budget	City Administrator	2020	Carried over from previous plan

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
City of Westby – Cut heavy & dangerous trees down	FEMA grants & Town budget	Westby City Council	Continual Program	Carried over from previous plan
Heavy Snow, Ice or Blizzard Event				
Town of Forest – Purchase new trucks for snow removal	Grants and Town Budget	Town Board	As funding becomes available	New project
Town of Forest – Purchase new backhoe for snow removal	Grants and Town Budget	Town Board	As funding becomes available	New project
Town of Forest – Purchase radio equipment and repeater tower for emergency communications	Grants and Town Budget	Town Board	As funding becomes available	New project
Village of Coon Valley – Purchase a snow plow truck with a sander	Grants and Village Budget	Village Clerk	2020	Carried over from previous plan
Village of Stoddard – Purchase new dump truck for snow removal	Grants and Village Budget	Kent Hablestad, 608-457-2136	When funding can be obtained	Carried over from previous plan
Village of Stoddard – Purchase new end loader for assistance in snow removal	Grants and Village Budget	Kent Hablestad, 608-457-2136	When funding can be obtained	Carried over from previous plan
Village of Viola – Bury electrical lines	Grants and Village Budget	Village Board	Continual	New Project
City of Hillsboro – Upgrade existing and purchase additional snow removal equipment	Grants/City Budget	Adam Sonntag, City Administrator 608-489-2350	Continual	Carried over from previous plan
Extreme Cold and Heat Event				
Town of Coon – More training of emergency personnel for who provide emergency services in times of extreme heat and cold.	Existing Town Officials and County staff resources	County Emergency Management Coordinator and County Emergency Management Committee		Carried over from previous plan
Town of Stark – Install solar or wind backup power supply in the Town Hall for emergency shelter situations.	Grant and Village Budget	Town Board	2019	New Project
Village of Coon Valley – Purchase needed equipment to allow the Village Hall to become a Heating and Cooling center	Grant and Village Budget	Village Clerk	2019	Carried over from previous plan
Village of Chaseburg – Purchase a backup generator to replace the old unreliable one the village currently has	Grant and Village Budget	Maintenance Department	2019	Carried over from previous plan
Village of Readstown – Purchase a backup generator and an air conditioner for use in storm shelter	Grant and Village Budget	Village Board	2019	Carried over from previous plan
City of Westby – Purchase backup home generators for use by residents.	Grants and Village Budget	City Council	2019 – 2020	Carried over from previous plan
Earthquake, Landslide and Subsidence				
Town of Wheatland - Reconstruct 600 feet of Will Kumlin Road away from edge of deep ravine.	FEMA grants and Town budget	Town of Wheatland Board, Town Chairman	2019 Construction Season	Carried over from previous plan
Town of Bergen – Identify and repair hillsides that continue to slide onto roads.	Town budget	Town board	When funding can be obtained	New Project
Forest Fires, Drought				
T. Bergen – Purchase a modern fire truck for rural response	\$125,000	Town Board	When funding can be obtained	New Project

Mitigation Action or Project	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
T. Coon – Develop a plan which coordinates all surrounding fire departments pertaining to fire bans	Town budget	Town Board, County Emergency Management Coordinator	2020	New Project
T. Forest – Replace all fire number signs	Grants and Town Budget	Town Board	When funding can be obtained	New Project
C. Westby – Construct new water tower	Grants and City Budget	Public Works Director	2019	New Project
Train Derailment				
T. Bergen – Continue to work with rail lines on developing an emergency response plan	Grants	Town Board	When funding can be obtained	New Project

Vernon County Plan Maintenance and Adoption Action Plan

The following table is the Vernon County Multi-Hazards Mitigation Plan Maintenance and Adoption Action Plan. The plan maintenance and adoption projects are detailed in Chapter 5. Vernon County's Plan Maintenance and Adoption goal is: *To provide a continual opportunity for local officials to update, maintain and implement the Vernon County Multi-Hazard Mitigation Plan.*

Table 4-5
Vernon County Multi-Hazards Mitigation Plan Maintenance and Adoption Action Plan

Plan Maintenance and Adoption Projects	Funding Source(s)	Responsible Official or Organization	Project Timetable	Comments
Continual monitoring of progress made toward achieving plan goals, projects and action items by the Emergency Management Coordinator	Existing County resources	County Emergency Management Director	Annually	See Chapter 5
Post disaster Multi-Hazard Mitigation Plan review and comment period for plan stakeholders	Existing County staff resources	County Emergency Management Director in cooperation with County, City, Village and Town Officials	Post disaster	See Chapter 5
Annual Multi-Hazard Mitigation Plan review and comment period for plan stakeholders	Existing County staff resources	County Emergency Management Director in cooperation with County, City, Village and Town Officials	Annually	See Chapter 5
County, City, Village, and Town plan approval by adopting resolutions	Existing County, City, Village, and Town resources	County Emergency Management Director in cooperation with County, City, Village and Town Officials	After plan modification	See Chapter 5

5.0 VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN MAINTENANCE AND ADOPTION

Plan Maintenance

Since changes across the County's landscape will always be occurring this Multi-Hazards Mitigation Plan should be monitored and amended as needed to meet these changing conditions. To accomplish this, it has been determined that the County Emergency Management Director should review the contents of the plan for its applicability and prioritize projects each year during the 3rd quarter and report to the Emergency Management Committee on the progress made pertaining to goals, projects and actions contained in the plan. Prior to the end of each calendar year, the County Emergency Management Committee shall recommend either reaffirmation, amendment or update (rewrite) of the plan to the County Board for their action based on recommendations provided by county staff, public input and other pertinent information provided to the committee. The Disaster Mitigation Act of 2000 requires that this plan be evaluated and updated at least every five years to remain eligible for assistance.

It has also been determined that the County Emergency Management Committee evaluate the plan after disasters to determine if the information, goals and actions are still appropriate in light of the given disaster. In addition, the committee shall evaluate the plan bi-annually to assess the following: are the goals and objectives addressing current or expected conditions; are the nature, magnitude, and/or type of risks changed; have priorities for mitigation projects changed, are current resources appropriate for implementing the plan; are there implementation problems, such as technical, political, legal, or coordination issues with other agencies; have agencies and other partners participated as proposed; and are mitigation projects being pursued. When this plan is being considered for evaluation due to the annual evaluation policy or because of the post disaster evaluation policy it will be the County Emergency Management Director's responsibility to let stakeholders know through meeting notices and public announcements about the plan evaluation process and provide them with an adequate comment period if they cannot attend a plan evaluation meeting.

Plan Coordination

Upon adoption of the plan by the County and other participating local units of government the County Emergency Management Director will distribute copies to key stakeholders including any additional copies needed by local governments that participated in and adopted the plan. The initial Hazard Mitigation Plan was not incorporated very well into other planning activities. The plan was used during land use planning by some but not all municipalities. To ensure that this updated plan will be incorporated into planning activities within the county, the County Emergency Management Director will monitor other planning activities being undertaken and see to it that any related topics, goals or projects in this plan are presented to those involved in planning activities and especially those involved in preparing county, city, village or town comprehensive plans. In addition, the annual plan evaluation policy should serve as another method to ensure the information, findings, goals, actions and projects in this plan are incorporated into other planning projects and initiatives across the County. Lastly the County Emergency Management Director will annually send out letters to all participating local units of government, county department directors and all new county board supervisors, their respective mitigation projects listing along with an explanation of the plan's mitigation projects and that these mitigation projects should be incorporated into any new or revised comprehensive plans, ordinances and codes.

Municipal Authority to implement the Plan

The incorporated communities Chaseburg, Coon Valley, De Soto, Genoa, La Farge, Ontario, Readstown, Stoddard, Viola, Hillsboro, Viroqua and Westby all have the authority through taxing or annual budgets to commit funding to mitigation projects. All of the Towns also have the authority through taxing or annual budgets to commit funding. In addition, Vernon County also has the authority to commit funds to mitigation projects.

Plan Approval Process

The adoption of this plan by the County and any participating local government certifies to program and grant administrators from FEMA and Wisconsin Emergency Management that the Plan's findings, goals and projects have been thoroughly considered and they have a desire to take planned actions to reduce losses from future hazard events. In exchange for this local commitment to plan to reduce future losses the Federal Emergency Management Agency and Wisconsin Emergency Management Agency will designate the County and other participating local governments that adopted the plan eligible for their Hazard Mitigation Grant Programs. The County and other participating local units of government are to adopt this plan by appropriate public meeting notice and by resolution.

Adoption Resolutions

The following is a list of the local units of government in the County. Those local units of government that adopted this plan are indicated with a check mark. The adoption resolutions from each local government follow this list.

<u>Municipality</u>	Adopted 2012-2016 Plan	Adopted 2018-2022 Plan	<u>Municipality</u>	Adopted 2012-2016 Plan	Adopted 2018-2022 Plan
Vernon County	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Town of Union	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Bergen	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Town of Viroqua	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Town of Christiana	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Town of Webster	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Clinton	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Town of Wheatland	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Coon	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Town of Whitestown	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Forest	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Village of Chaseburg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Franklin	<input type="checkbox"/>	<input type="checkbox"/>	Village of Coon Valley	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Genoa	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Village of Desoto	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Greenwood	<input type="checkbox"/>	<input type="checkbox"/>	Village of Genoa	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Hamburg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Village of La Farge	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Harmony	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Village of Ontario	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Hillsboro	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Village of Readstown	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Jefferson	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Village of Stoddard	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Kickapoo	<input type="checkbox"/>	<input type="checkbox"/>	Village of Viola	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Liberty	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	City of Hillsboro	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Stark	<input checked="" type="checkbox"/>	<input type="checkbox"/>	City of Viroqua	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Town of Sterling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	City of Westby	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Town of Bergen Adopting Resolution

RESOLUTION # 211

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Bergen recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

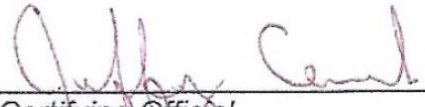
WHEREAS, the Town of Bergen participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Bergen, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Bergen Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: 2-11-2019

DATE: 2-11-19



Certifying Official

Town of Christiana Adopting Resolution

RESOLUTION # _____

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Christiana recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Town of Christiana participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Christiana, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Christiana Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: 1-8-2019

DATE: 1-8-2019

David Egg
Certifying Official

Town of Clinton Adopting Resolution

RESOLUTION # 2019-1

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Clinton recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and


WHEREAS, the Town of Clinton participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Clinton, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Clinton Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: 3-0

DATE: January 9, 2019



Certifying Official

Town of Coon Adopting Resolution

RESOLUTION # _____

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Coon recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Town of Coon participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Coon, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Coon Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: Yes - All Aye

DATE: 1/12/19

Orlando D. Bakken - Town Chairman
Certifying Official

Town of Forest Adopting Resolution

RESOLUTION # 2019-1

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Forest recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Town of Forest participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Forest, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Forest Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: RESOLUTION #2019-1

DATE: 1/17/2019

Mark K. Davidson TOWN OF FOREST
CHAIRMAN
Certifying Official

Town of Franklin Adopting Resolution

Town of Genoa Adopting Resolution

RESOLUTION # 2019-01

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Genoa recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and


WHEREAS, the Town of Genoa participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Genoa, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Genoa Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: 1-15-2019

DATE: _____



Town Clerk
Certifying Official

Town of Greenwood Adopting Resolution

Town of Hamburg Adopting Resolution

RESOLUTION # 01222019

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Hamburg recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Town of Hamburg participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Hamburg, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Hamburg Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: 1-22-2019 Monthly Meeting

DATE: 1-22-2019

[Signature] - Township Clerk
Certifying Official

Town of Harmony Adopting Resolution

RESOLUTION # 209-1

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Harmony recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Town of Harmony participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Harmony, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Harmony Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED _____

3- Year Ordinance

DATE: _____

1-10-19

John I. Goeh

Certifying Official

Town of Hillsboro Adopting Resolution

RESOLUTION # 2019-01

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Hillsboro recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

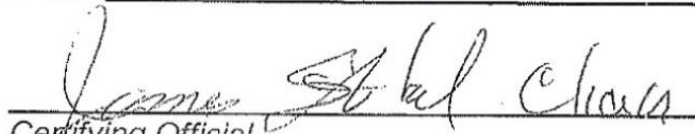
WHEREAS, the Town of Hillsboro participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Hillsboro, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Hillsboro Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: Town of Hillsboro

DATE: 1-9-19



Certifying Official

Town of Jefferson Adopting Resolution

RESOLUTION # _____

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Jefferson recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Town of Jefferson participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Jefferson, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Jefferson Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: Yes

DATE: 1-21-19

Donald Langford
Certifying Official

Town of Kickapoo Adopting Resolution

Town of Liberty Adopting Resolution

RESOLUTION # 019RS01

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Liberty recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Town of Liberty participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Liberty, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Liberty Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: 2-yes 0-no 1-excused

DATE: 1-14-2019

TERRY THIERS
Certifying Official TOWN OF LIBERTY CHAIRMAN

Town of Stark Adopting Resolution

Town of Sterling Adopting Resolution

RESOLUTION # 2019-1

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Sterling recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Town of Sterling participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Sterling, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Sterling Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: _____

DATE: 1-17-2019

Ken Walker, Chairman
Certifying Official

Kay Yanske, Town Clerk

Town of Union Adopting Resolution

RESOLUTION # 2019-1

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Union recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Town of Union participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Union, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Union Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: 3-0

DATE: 1/2/19



Certifying Official

Town of Viroqua Adopting Resolution

Town of Webster Adopting Resolution

RESOLUTION # 2019-1

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Webster recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and


WHEREAS, the Town of Webster participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Webster, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Webster Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: 3-0

DATE: 1-15-19


Certifying Official

Chairman
John Young

Town of Wheatland Adopting Resolution

RESOLUTION # 2019-001

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Wheatland recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Town of Wheatland participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Wheatland, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Wheatland Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: yes

DATE: 1/17/2019



Certifying Official

Town of Whitestown Adopting Resolution

RESOLUTION # 1-2019

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Town of Whitestown recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Town of Whitestown participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Whitestown, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Town of Whitestown Town Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: Unanimous

DATE: 1-8-2019

James Lee - Chairman
Certifying Official

Village of Chaseburg Adopting Resolution

RESOLUTION # 1-2019

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Village of Chaseburg recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Village of Chaseburg participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Chaseburg, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Village of Chaseburg Village Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: Motion by Tom Heller Second by Mike Miller
passed with all ayes

DATE: 1/7/2019

[Signature] - Village President
Certifying Official

Village of Coon Valley Adopting Resolution

RESOLUTION # 1-2019

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Village of Coon Valley recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Village of Coon Valley participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Coon Valley, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Village of Coon Valley Village Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED:

1/8/2019 Penita Williamson
Clerk/Treasurer

DATE:

1/8/2019

Karl Henrichsen
Certifying Official

Karl Henrichsen
Coon Valley Village President

Village of De Soto Adopting Resolution

RESOLUTION # 1-19

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Village of De Soto recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Village of De Soto participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of De Soto, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Village of De Soto Village Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: January 8, 2019

DATE: January 8, 2019



Certifying Official

Village of Genoa Adopting Resolution

RESOLUTION # 2019-01

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Village of Genoa recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

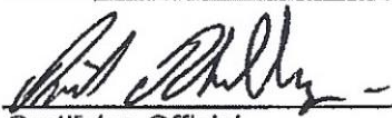
WHEREAS, the Village of Genoa participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Genoa, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Village of Genoa Village Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED:  _____

DATE: 1-9-19



Certifying Official

Village of La Farge Adopting Resolution

RESOLUTION # 1-14-19

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Village of La Farge recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

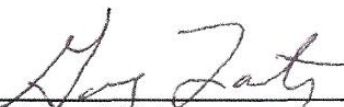
WHEREAS, the Village of La Farge participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of La Farge, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Village of La Farge Village Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: 01-14-19

DATE: 01-14-19



Certifying Official

Greg Lawton, Village President

Village of Ontario Adopting Resolution

RESOLUTION # 2019-01

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Village of Ontario recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and


WHEREAS, the Village of Ontario participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Ontario, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Village of Ontario Village Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: 1/14/19

DATE: 1/14/19


Certifying Official

Village of Readstown Adopting Resolution

RESOLUTION # 031419-01

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Village of Readstown recognizes the threat that natural disasters pose to people and property; and

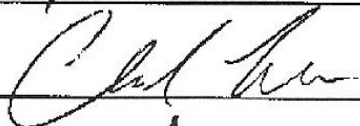
WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential harm to people and property and save taxpayer dollars; and

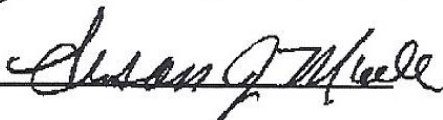
WHEREAS, an adopted all hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Village of Readstown has participated jointly in the planning process with Vernon County and other local units of government to prepare the Multi-Hazards Mitigation Plan; and

NOW, THEREFORE BE IT RESOLVED, that the Village of Readstown, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

PASSED ON: March 14, 2019

Village Board President: 

Village Clerk - Certifying Official: 

Village of Stoddard Adopting Resolution

VILLAGE OF STODDARD

Village Board – Telephone (608) 457-2136

Regular Meetings Second Tuesday Each Month

Village Hall, 180 N. Main Street

Stoddard, WI 54658

Robert Wurtzel - President

Garry Oliver

Robin Palmer

Steve Davis

Martin Osinski

Jon Crusan

Tom Venner

Resolution 2019 - #01

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Village of Stoddard recognizes the threat that natural hazards pose to people and property; and
WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, and adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Village of Stoddard participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Stoddard, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Village of Stoddard Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: Motion Garry Oliver, second Martin Osinski to approve. All ayes. Motion passed unanimously.

DATE: January 8, 2019


Kent Hatlestad – Certifying Official

Village of Viola Adopting Resolution

RESOLUTION # 19-01

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the Village of Viola recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, the Village of Viola participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Viola, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the Village of Viola Village Board will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: 1/17/19

DATE: 1/17/19



Certifying Official

City of Hillsboro Adopting Resolution

RESOLUTION # 01-2019

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the City of Hillsboro recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and


WHEREAS, the City of Hillsboro participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the City of Hillsboro, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the City of Hillsboro will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: Yes: 7 No: 0 - 1-21-2019

DATE: 1-21-2019


Certifying Official

City of Viroqua Adopting Resolution

RESOLUTION # 019RS001

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the City of Viroqua recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and


WHEREAS, the City of Viroqua participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the City of Viroqua, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the City of Viroqua will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: 8-yes 0-No 1-Excused

DATE: 1/8/2019



Certifying Official

City of Westby Adopting Resolution

RESOLUTION # _____

ADOPTING THE VERNON COUNTY MULTI-HAZARDS MITIGATION PLAN 2018-2022

WHEREAS, the City of Westby recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazards mitigation plan is required as a condition of future grant funding for mitigation projects; and

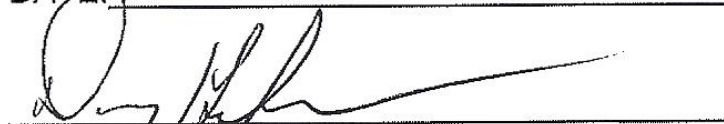
WHEREAS, the City of Westby participated jointly in the planning process with Vernon County and the other local units of government within the County to prepare a Multi-Hazards Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the City of Westby, hereby adopts the Vernon County Multi-Hazards Mitigation Plan 2018-2022 as an official plan; and

BE IT FURTHER RESOLVED, that the City of Westby will provide a copy of this signed resolution to the Vernon County Emergency Management Department.

PASSED: _____

DATE: 1-2-2019



Certifying Official

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APPENDIX A

RISK ASSESSMENT SURVEY

And

Hazard Mitigation Projects Survey

MEMORANDUM

Date: March 27, 2017

To: All chief elected officials of local governments of Vernon County
All EMS, First Responders, Fire and Police Departments serving Vernon County

From: Chad Buros, Vernon County Emergency Management Director

Subject: Multi-Hazards Mitigation Information

Vernon County is in the process of updating the Vernon County Multi-Hazards Mitigation Plan 2012-2016. The County applied for and received a grant from Wisconsin Emergency Management to update this plan. The County has contracted with the Mississippi River Regional Planning Commission for the preparation of the update. The Multi-Hazards Mitigation Plan is a plan that describes the hazards that occur in Vernon County and lists strategies, goals and projects, which will eliminate or minimize the loss of life and damages. The plan covers hazards, i.e. tornadoes, hail, severe winds, flooding, extreme heat or cold, drought, snow storms, etc.

In order to get better idea of your particular hazards and the areas affected we are asking for your assistance in this process. Enclosed you will find two surveys a Hazard Risk Assessment Survey and a Project Needs Survey, please complete these surveys and return them before April 30th, 2017.

The plan identifies mitigation projects by municipality so please list any needs within your jurisdiction regarding the mitigation a hazard. For example, if you know of a road that floods every spring and cuts off residents please make a note of it. Other potential needs would be severe weather shelters; update ordinances regarding building construction, additional flood warning, or flood insurance. These are only a few of the possible mitigation ideas; please do not limit your ideas to these. It is important to identify potential projects as projects identified in a plan that has been adopted by the county or municipality become eligible for certain FEMA grant programs. This is not to say they will get grant funding, but they will become eligible for grant funding.

If you have any questions regarding the surveys or potential projects, please contact myself at 608-637-5266 or Dave Bonifas with the Mississippi River Regional Planning Commission at 608-785-9396 or email dave@mrrpc.com.

Thank you for your time in this matter.

Chad Buros, Director Emergency Management
Vernon County

VERNON COUNTY MULTI-HAZARDS RISK ASSESSMENT SURVEY

From your experience living in your community and the current societal and environmental conditions please check one of the three columns titled Low, Medium or High-Risk Rating to the right of each hazard listed in the far left column. Your check mark should be based on your opinion of that natural hazard's probable threat to your community's health and public safety over the coming five years. Each of the Hazards listed is to receive only one check mark. For example, if you check a medium risk rating for Lightning Storms this would be interpreted to mean that you think that Lightning Storms will probably have a medium harmful affect on your community in comparison to the other hazards listed. This survey is one of the methods Vernon County is using to receive public input into the plan. The survey information you and others provide is advisory and will not by itself set future public policy on how to deal with natural hazards.

NATURAL HAZARDS - Each natural hazard should receive either a low, medium, or high risk rating check mark.	Low Risk Rating ✓ A hazard risk rating of low means that in your opinion this hazard probably will have the least harmful affect on health and public safety in your community in comparison to the other hazards listed in column one.	Medium Risk Rating ✓ A hazard risk rating of medium means that in your opinion this hazard will probably have a medium or average harmful affect on health and public safety in your community in comparison to the other hazards listed in column one.	High Risk Rating ✓ A hazard risk rating of high means that in your opinion this hazard will probably have the highest or greatest harmful affect on health and public safety in your community in comparison to the other hazards listed in column one.
Hail Storms			
Lightning Storms			
Thunderstorms			
Tornado/High Winds			
Flash Flooding			
Riverine Flooding			
Lake Flooding			
Stormwater Flooding			
Dam Failure Flooding			
Forest Fires			
Wildland Fires			
Coastal Hazards			
Heavy Snow Storm			
Ice Storm			
Blizzard			
Extreme Cold			
Earthquake			
Extreme Heat			
Agricultural			
Drought			
Fog			
Landslide			
Subsidence			
Pandemic Flu			
Railroads			
River Traffic / Cargo			

Do you have any suggestions on projects or programs that may be undertaken by your local unit of government, the County or others that would reduce future losses and the threat to health and public safety from any of the above natural hazards? Please describe your suggestion(s) here or on a separate sheet of paper.

I am a resident of the (circle one) Town / Village / City of _____

Please return this survey by April 31, 2017 to Chad Buros, Director Vernon County Emergency Management, 318 Fairlane Drive, Suite 5, Viroqua WI 54665, Telephone: 608-637-5266, or fax to Dave Bonifas at 608-785-9394.

VERNON COUNTY MULTI-HAZARDS MITIGATION PROJECT NEED SURVEY

The Vernon County Emergency Management Department along with the Mississippi River Regional Planning Commission are updating the existing Vernon County Multi-Hazards Mitigation Plan. A key part of this plan is the identification of policies, programs and projects from throughout the county that will reduce losses from future hazards. We are asking for your input in preparing this portion of the plan. Please be inclusive and generous in your ideas for policies, programs, or projects that you think are needed for your local government or organization. Listing a project in this survey will be interpreted as something needed to meet a local need and not as a commitment to undertake it. Projects you list may possibly become eligible for funding from Federal and State grant programs.

1. Does your local unit of government or organization you represent have any flooding, storm water drainage or dam hazard mitigation projects? If so, please describe below: (Examples of this these types of projects could include: road raising (dry land access) and/or repair, bridge improvements, culvert improvements, drainage channel improvements, elevation of buildings, flood proofing of buildings, floodplain mapping, dam hydraulic shadow mapping, new river gages, flood warning plans, evacuation plans, storm water, water line and sewer line improvements, and dam inspection or maintenance projects.)

Proposed flooding, storm water drainage, or dam hazard mitigation projects your local government or organization would like to seriously consider.	Estimated Project Cost if Known?	Proposed Project Beginning & Ending Date if Known	Key Project Contact Person & Telephone Number
a.			
b.			
c.			
d.			

2. Does your local unit of government or organization you represent have any hail, thunderstorm, lightning and fog hazard mitigation projects? If so, describe below. (Examples of these types of projects could include: Improving protection of warning and communication equipment, burying of power and communication lines, improvements to public early warning systems and plans, improvements to roadways and waterways that provide aid to visibility.)

Proposed hail, thunderstorm, lightning and fog hazard mitigation projects your local government or organization would like to seriously consider.	Estimated Project Cost if Known?	Proposed Project Beginning & Ending Date if Known	Key Project Contact Person & Telephone Number
a.			
b.			
c.			
d.			

3. Does your local unit of government or organization you represent have any tornado, and high wind mitigation projects you would like to undertake? If so, describe below. (Examples of these types of projects could include: public warning communication systems and networks i.e. sirens, telecommunications, radios, weather radios, weather spotters etc.; storm shelters-particularly for mobile home courts and campgrounds; projects that strengthen public and private structures i.e. structural bracing, straps, anchor bolts, using laminated or impact resistant glass; concrete safe rooms for mobile home parks, fairgrounds and shopping areas; protection of permanent and temporary debris disposal sites by fencing or relocation; burying power and telecommunication lines; purchase power supply backup power resources-generators.)

Proposed tornado and high wind hazard mitigation projects your local government or organization would like to seriously consider.	Estimated Project Cost if Known?	Proposed Project Beginning & Ending Date if Known	Key Project Contact Person & Telephone Number
a.			
b.			
c.			
d.			

4. Does your local unit of government or organization you represent have any extreme cold and heat mitigation projects you would like to undertake? If so, describe below. (Examples of these types of projects could include: local governments, civic and social service organizations can organize outreach activities to vulnerable residents during periods of extreme temperature; local governments, civic and social service organizations can work together to offer special arrangements for paying utility bills of vulnerable residents during times of extreme temperatures; local governments and civic and social service organizations can establish heating and cooling centers for vulnerable residents.)

Proposed extreme cold and heat event mitigation projects your local government or organization would like to seriously consider.	Estimated Project Cost if Known?	Proposed Project Beginning & Ending Date if Known	Key Project Contact Person & Telephone Number
a.			
b.			
c.			
d.			

5. Does your local unit of government or organization you represent have any forest and wildfire hazard mitigation projects you would like to undertake? If so, describe below. (Examples of these types of projects could include: promote use of non-combustible roof covering, fire safe construction materials and techniques; public education of smoking hazards and risks of recreational fires; use of zoning and subdivision regulations that create defensible space or buffer zones between structures and woodlands or grasslands; select logging, pruning and clearing of vegetation; create fire breaks; planting fire resistant vegetation; having adequate water supply locations, tanker trucks and pumping equipment.)

Proposed forest and wildfire mitigation projects your local government or organization would like to seriously consider.	Estimated Project Cost if Known?	Proposed Project Beginning & Ending Date if Known	Key Project Contact Person & Telephone Number
a.			
b.			

6. Does your local unit of government or organization you represent have any heavy snow, ice or blizzard hazard mitigation projects you would like to undertake? If so, describe below. (Examples of these types of projects could include: promote traveler emergency preparedness in education programs on severe weather hazards; burying electric and telecommunication lines underground; joint acquisition of vehicles and equipment among local governments to respond to severe winter storms; use of snow fences, including planting of trees to limit blowing and drifting of snow over roadways and to protect critical facilities.)

Proposed heavy snow, ice or blizzard mitigation projects your local government or organization would like to seriously consider.	Estimated Project Cost if Known?	Proposed Project Beginning & Ending Date if Known	Key Project Contact Person & Telephone Number
a.			
b.			
c.			
d.			

7. Does your local unit of government or organization you represent have any earthquake, landslide or subsidence hazard mitigation projects you would like to undertake? If so, describe below. (Examples of these types of projects could include: mapping and educating the public about areas in the county vulnerable to landslides and subsidence; identify and warn public about areas where falling rock from hillsides or cliffs can cause damage or harm; prepare zoning, subdivision, and site construction ordinances that set land use, development density, setback and slope construction standards.)

Proposed earthquake, landslide and subsidence mitigation projects your local government or organization would like to seriously consider.	Estimated Project Cost if Known?	Proposed Project Beginning & Ending Date if Known	Key Project Contact Person & Telephone Number
a.			
b.			

8. Does your local unit of government or organization you represent have any agricultural or drought hazard mitigation projects you would like to undertake? If so, describe below. (Examples of these types of projects could include: encouraging the purchase of crop insurance to preserve economic stability for farmers during drought; maintaining adequate municipal water storage supplies to provide water for human consumption over an extended period during times of drought; pass local government water emergency control ordinances to limit water use; construction of reservoirs for use during times of drought for agricultural use; purchasing tank trucks and pumping equipment for conveyance of water to special impact areas.)

Proposed agricultural or drought hazard mitigation projects your local government or organization would like to seriously consider.	Estimated Project Cost if Known?	Proposed Project Beginning & Ending Date if Known	Key Project Contact Person & Telephone Number
a.			
b.			

9. Does your local unit of government or organization you represent have any pandemic flu mitigation projects you would like to undertake? If so, describe below. (Identify nutrition program adaptations needed to respond to social distancing, voluntary quarantines, and possible disruption of the normal food supply, Develop clear and consistent guidance for planning for home care of ill individuals, such as when and where to seek medical care, how to safely care for an ill individual at home, and how to minimize disease transmission in the household. Develop guidance for appropriate use of community resources, such as home healthcare services, telephone care, the 9-1-1 emergency telephone system, emergency medical services, and triage services (nurse-advice lines, self-care guidance, and at-home monitoring systems) that could be deployed to provide resources for home care. Develop a plan to use media and trusted sources in communities to 1) explain the concepts of pandemic preparedness, 2) explain what individuals and families can do to be better prepared, and 3) disseminate clear information about what the public may be asked to do in the case of a pandemic.)

Proposed pandemic flu mitigation projects your local government or organization would like to seriously consider.	Estimated Project Cost if Known?	Proposed Project Beginning & Ending Date if Known	Key Project Contact Person & Telephone Number
a.			
b.			

10. Does your local unit of government or organization you represent have any railroad hazard mitigation projects you would like to undertake? If so, describe below. (Examples of these types of projects could include: (Examples are: additional emergency response training; purchase of new or additional emergency response equipment; relocate critical emergency response structures away from rail lines; develop evacuation plans; upgrade rail crossings.)

Proposed railroad hazard mitigation or river cargo projects your local government or organization would like to seriously consider.	Estimated Project Cost if Known?	Proposed Project Beginning & Ending Date if Known	Key Project Contact Person & Telephone Number
a.			
b.			
c.			

Thank you for completing the survey. Please return it by April 31, 2017 to Chad Buros, Director Vernon County Emergency Management, 318 Fairlane Drive, Suite 5, Viroqua WI 54665, Telephone: 608-637-5266, or fax to Dave Bonifas at 608-785-9394.

APPENDIX B

LOCAL EMERGENCY MANAGEMENT COMMITTEE AGENDAS,

VERNON COUNTY TOWNS ASSOCIATION MEETING AGENDA,

MISSISSIPPI RIVER REGIONAL PLANNING COMMISSION AGENDA

&

PUBLIC HEARING NOTICE



VERNON COUNTY OFFICE OF

EMERGENCY MANAGEMENT

318 FAIRLANE DRIVE, SUITE 5
VIROQUA, WISCONSIN 54665

Brandon Larson, Director
Telephone: (608) 637-5266

Fax: (608) 637-5502

AGENDA

EMERGENCY MANAGEMENT COMMITTEE MEETING

Thursday May 3rd, 2018

9:30

**Erlandson Office Building
1st Floor Conference Room**

1. Call to Order – Chairman Dennis Brault
2. Affirmation of Proper Public Notice of Meeting
3. Review and Approve Minutes from April 5th, 2018 meeting
4. Audience to Visitors
5. Dave Bonifus, MRRPC- Multi Hazard Mitigation Plan update
6. Director's Report
7. Presentation/Approval of Vouchers and Invoices
8. Any other items for discussion
9. Set next meeting date
10. Adjournment

Emergency Management committee meets at 9:30 a.m. May 3rd, 1st Floor Conference Room, Erlandson Office bldg. Dave Bonifus- Multi Hazard Mitigation Plan; Director's Report; Approval of vouchers; other items for discussion; confirm next meeting date.

***Committee Members-If you are unable to attend please contact Brandon at the Emergency Management Office.**



VERNON COUNTY OFFICE OF
EMERGENCY MANAGEMENT

318 FAIRLANE DRIVE, SUITE 5
VIROQUA, WISCONSIN 54665

Brandon Larson, Director
Telephone: (608) 637-5266

Fax: (608) 637-5502

AGENDA

EMERGENCY MANAGEMENT COMMITTEE MEETING

Wednesday October 3rd, 2018

09:30 a.m.

Erlandson Office Building

1st Floor Conference Room

1. Call to Order – Chairman Dennis Brault
2. Affirmation of Proper Public Notice of Meeting
3. Review and Approve Minutes from September 5th, 2018 meeting
4. Audience to Visitors
5. Dave Bonafus- Multi Hazard Mitigation Plan review/approval, set public hearing
6. Director's Report
 - Current Projects List
 - Trainings
 - August Flooding update
7. Responses Made
8. Presentation/Approval of Vouchers and Invoices
9. Any other items for discussion
10. Set next meeting date
11. Adjournment

Emergency Management committee meets at 09:30a.m. October 3rd, 1st Floor Conference Room, Erlandson Office bldg. Multi Hazard Mitigation Plan review; Director's Report (Current Projects List, trainings, Aug flood update); Responses Made; Approval of vouchers; other items for discussion; confirm next meeting date.

Vernon County Chapter
Wisconsin Towns Association
Ole Yttri – Chair
George Wilbur – Secretary

Agenda
Thursday, April. 27, 2017
7:30 PM
Vernon County Board Room

1. Pledge of Allegiance
2. Introduction of members and guests – (Please state your name and town affiliation.)
3. Adoption of minutes
4. Treasurer's report
5. VC Emergency Mngt. – Hazard Mitigation Planning Grant, Dave Bonifus, Mississippi River Planning Commission
6. Vernon County Grant Administrator-Diane Maginnis, CDBG Grant Project Updates
7. Coffee break
8. Reports from state elected officials present—Lee Nerison, Ron Kind office _____
Tony _____, Ron Johnson office, _____
9. Information from district officials Jerry Dorr and Betty Manson
10. Member concerns
11. Next meeting: July 27, 2017, 6:00 PM -- Summer Picnic ?? _____
12. Adjourn



MISSISSIPPI RIVER REGIONAL PLANNING COMMISSION

1707 Main Street, Suite 435
La Crosse, WI 54601
Phone: (608) 785-9396
Fax: (608) 785-9394
Email: plan@mrrpc.com
Website: mrrpc.com

James Kuhn, Cashton, WI
Chairman
Margaret Baecker Independence, WI
Vice Chairman
Vicki Burke, Onalaska, WI
Secretary & Treasurer
Greg Flogstad, Onalaska, WI
Director

MISSISSIPPI RIVER REGIONAL PLANNING COMMISSION BIMONTHLY MEETING NOTICE AND AGENDA 10:00 AM, Wednesday, April 11, 2018 AmericInn, 1835 Rose Street, La Crosse, WI 54601

< MRRPC BIMONTHLY MEETING AGENDA >

1. Roll call and guest introductions
2. Decision on February 14, 2018 Bimonthly Meeting Minutes
3. Decision on Treasurer's Report: (a) February 2018 and March 2018 Account Balance, Revenue and Expense Reports. (b) Revolving Loan Fund Reports: (1) Business Capital Fund, (2) Crawford, Monroe Vernon - CMV Growth Development Fund (3) La Crosse County Loan Fund (4) Monroe County Loan Fund. (5) Pierce County Loan Fund. VB/GF
4. Presentation of 2017 MRRPC Audit by Mike Temp, CPA, Tostrud and Temp, S.C.
5. Decision to accept the 2017 MRRPC Audit.
6. Decision on Executive and Administration Committee recommendation on 2018 staff wage adjustments.
7. Decision on Executive and Administration Committee Recommendation on 2019 County Contributions.
8. Decision on return of excess revolving loan funds to the US Department of Commerce - Economic Development Administration. GF
9. Decision on contract to administer the Pierce County Community Development Block Grant business revolving loan fund. GF
10. Decision on contract to prepare a Comprehensive Plan for the City of Mondovi. GF
11. Decision on future lending policies and procedures for US Department of Commerce EDA revolving loan funds. GF
12. Report on Buffalo County zoning ordinance public hearing and county board meeting. PF
13. Report on the Association of Wisconsin Regional Planning Commissions First Annual Summit on Thursday June 14, 2018, in Wisconsin Rapids at the Meade Inn. GF
14. Commissioners' questions and comments on the following projects listed in the written staff report:
 - a. Crawford County Hazard Mitigation Plan
 - b. Trempealeau County Hazard Mitigation Plan
 - c. Scenic Mississippi Regional Transit (SMRT) bus serving Crawford, Vernon and La Crosse counties
 - d. Viroqua Recreation Plan
 - e. The Upper Mississippi River Manufacturing Alliance - TUMMA
 - f. Trempealeau County Towns - Comprehensive Plan update

<AGENDA CONTINUED>

- g. Development of Mississippi River Parkway Commission facilities and amenity plan
- h. Monroe County Hazard Mitigation Plan
- i. Vernon County Hazard Mitigation Plan
- j. Report on regional process to prepare regionally coordinated county human services transportation plans for 2018-2023 for state and federal transportation aids funding eligibility.
- k. Coulee Region Business Center and Western Wisconsin Workforce Development Board's Joint Application of \$45,000 to the U.S. Department of Commerce - Economic Development Administration to fund a feasibility study on development of a fabrication lab, food processing, packaging and distribution center and a transitional jobs program to assist persons with barriers to employment.
15. Old Business
16. New Business
17. Adjourn

Commissioners

Buffalo County Mary Anne McMillan Urell Del Twidt John Schlesselman	La Crosse County Vicki Burke James Ehram Shelly Miller	Pierce County Richard Purdy William Schroeder James Ross
Crawford County Greg Russell Gerald Krachey Ron Leys	Monroe County Sharon Folcey James Kuhn Cedric Schnitzler	Trempealeau County Margaret Baecker Ernest Vold Phillip Borreson
Jackson County Ron Carney Brad Chown Todd Stittleburg	Pepin County Bruce Peterson Gerald Bauer James Kraft	Vernon County Herb Cornell Jo Ann Nickelatti Nancy Jaekel

Staff
Dave Bonifas, Community Development Planner
Peter Fletcher, Transportation Planner
Greg Flogstad, Director
Sarah Ofte, Administrative Assistant

Providing Planning and Economic Development Services to Improve the Environment, Economy and Quality of Life
 ■ Land Use Planning and Zoning Assistance ■ Transportation Planning ■ Economic Development Planning ■ Recreation Planning ■ Business Lending
 ■ GIS Mapping ■ Grant Writing ■ Economic Data Dissemination ■ Assist Local Interests in Responding to State, Federal and Private Programs
 ■ Advise on Local and Regional Planning Issues ■ Coordinating Programs and Activities ■ Advocate on Issues Affecting the Region

Affidavit of Publication

STATE OF WISCONSIN } ss.
La Crosse County

Public Hearing
Vernon County Emergency Management Committee will hold a public information meeting on the Vernon County All Hazards Mitigation Plan on Wednesday November 7th, 2018 at 9:00am at the Vernon County Erlandson Building — First Floor Conference Room, 318 Fairlane Drive, Viroqua. The purpose of this public hearing is to receive public input on the County's All Hazard Mitigation Plan that is being updated in accordance with the Federal Disaster Mitigation Act of 2000. By updating this five-part plan the County, Towns, Cities, and Villages can become eligible for FEMA's Hazard Mitigation Grant Programs. Prior to public comments a brief presentation will be made on the research that was conducted, and on some projects that have been identified to reduce future damages and losses from hazards. For those individuals who cannot attend this meeting and want to provide written comments, please submit them by October 31st, 2018 to: Brandon Larson, Director, Vernon County Emergency Management, 318 Fairlane Drive, Suite 5, Viroqua, WI, 54665. Thank you, Brandon Larson, Director WNAJLP 10/19 10/26 #7316

75930

Holly Hutschenreuter, being duly sworn, says that she is the principal clerk of the VERNON COUNTY BROADCASTER, a public weekly newspaper of general circulation, published in the City of Viroqua, WI, in the county and state aforesaid, and that the notice of which the annexed is printed copy taken from the paper in which the same was published, was inserted and published in the said newspaper on the

26th day of October 2018

and thereafter on the following dates, to wit:

being at least once in each week for 1 successive weeks/days.

Holly Hutschenreuter
Holly Hutschenreuter

Sworn to and subscribed before me this

26th day of October 2018

ANN-M BERRA
Notary Public
State of Wisconsin

Ann M Berra
Notary Public, La Crosse County, Wisconsin

My Commission as Notary Public will expire on the

8th day of March 2022



La Crosse Tribune, Winona Daily News, Westby Times, Vernon County Broadcaster, Coulee News, Tomah Journal/Monitor Herald, Jackson County Chronicle, Onalaska Courier Life, Houston County News, Tri-County Foxy Publications